University of Alberta

Mortuary Variability Among Middle Holocene Hunter-Gatherers in the Lake Baikal Region of Siberia, Russia

by

Hugh Garnet McKenzie

©

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Abstract

Conducted under the auspices of the Baikal Archaeology Project, this dissertation explores variation in mortuary practices both within and between Bronze Age hunter-gatherer cemeteries in the Little Sea microregion of Cis-Baikal, Siberia with a particular focus on how that variability was encoded in space. After establishing a temporal framework at local and regional scales through the examination of both new and existing radiocarbon dates (Chapter 3), the exploration of mortuary variability follows a multiscalar approach, beginning with the detailed examination of original data from the Bronze Age site of Khuzhir-Nuge XIV (Chapter 4). The results of this analysis are then compared with patterns of variability derived from more general observations at 19 neighbouring Bronze Age cemeteries (Chapter 5). Finally, the material is integrated through the application of Cannon's (2002) theoretical framework in which the spatial representation of death is linked to distinctions between different types of memory.

This approach produced a number of new insights relating to both Little Sea Bronze Age mortuary practices in particular and Cis-Baikal Middle Holocene hunter-gatherer culture dynamics in general. In particular, the results of this study suggest a large degree of heterogeneity between the investigated mortuary sites. It is proposed that the Little Sea Bronze Age mortuary record does not reflect a situation in which individual communities were using single cemeteries. Instead, the picture appears to be rather more complicated, in which a regional community of Bronze Age hunter-gatherers maintained a range of different types of mortuary sites. More specifically, it is suggested that at least some of the observed intersite diversity can

be attributed to the distinction between community cemeteries that would have been relevant to large—probably multifamily—social units and more specialized exclusionary sites that would have been relevant to smaller social units such as status groups. Finally, the analysis of radiocarbon dates conducted in this study not only clarifies both local and regional patterns of cemetery use through time, but it also produces some important contributions to the methodology of examining large sets of radiocarbon dates that should have significance beyond the Cis-Baikal.

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Table of Contents

Chapter 1: Introduction **1**

1.1 Introduction 1
1.2 Organization of Dissertation 3
1.3 Significance of Research 4
1.4 Terminological Conventions 6

Chapter 2: Context and Approach **9**

2.1 Physical Context 10
2.2 History of Archaeological Research in Cis-Baikal 19
2.3 Approach 46

Chapter 3: Chronological Patterns of Middle Holocene Cemetery Use in Cis Baikal **58**

3.1 Materials and Methods 60
3.2 Evaluation of the Khuzhir-Nuge XIV Radiocarbon Data 63
3.3 Microscale Patterns of Cemetery Use Through Time At Khuzhir-Nuge XIV 69
3.4 Meso- and Macroscale Patterns of Cis-Baikal Cemetery Use 77
3.5 Discussion and Conclusions 80

Chapter 4: Mortuary Variability at Khuzhir-Nuge XIV **105**

4.1 General Context 105
4.2 Data Collection Methods 106
4.3 Analytical and Statistical Methods 107
4.4 Spatial Distribution of Graves 108
4.5 Age and Sex 110
4.6 Core Variable Associations 113
4.7 Feature Level Attributes 115
4.8 Burial Level Attributes 123
4.9 Grave Inclusions Level 135
4.10 Conclusions 161

Chapter 5: Bronze Age Mortuary Variability in the Little Sea Microregion **201**

5.1 Little Sea Culture History 204
5.2 Bronze Age Mortuary Sites in the Little Sea Microregion 210
5.3 Discussion 258
5.4 Conclusions 263

Chapter 6: Synthesis of Little Sea Mortuary Variability 306

6.1 Memory, Ancestors, and the Spatial Representation of Death 307
6.2 Death and Memory in the Little Sea Microregion 310
6.3 Conclusions 319

Chapter 7: Conclusion 321

7.1 Temporal Aspects of Cemetery Use 322
7.2 Mortuary Variability and Social Organization 324
7.3 Future Research 325
7.4 Concluding Remarks 328

References Cited 330

List of Tables

Table *Page*

3.1 Results of radiocarbon dating for Khuzhir-Nuge XIV 98

3.2 Post-hiatus radiocarbon dates for the Cis-Baikal...100

3.3 Repeat radiocarbon determinations at Khuzhir-Nuge XIV 102

3.4 Combination and calibration of dates at Khuzhir-Nuge XIV 103

3.5 Outlier analysis of Khuzhir-Nuge XIV radiocarbon dates using a single prior probability of 0.1 104

4.1 Binomial Tests of simulated numbers of males and females at Khuzhir-Nuge XIV 196

4.2 Age-at-death by culture group at Khuzhir-Nuge XIV......................................196

4.3 Results of two-tailed Fisher Exact Test for the distributions of Glazkovo adults (>20 years-of-age), adolescents (12–20 years-of-age), children (<12 years-of age) and subadults (<20) across the three main burial clusters at Khuzhir-Nuge XIV (W=West, C=Centre, E=East)..197

4.4 Results of two-tailed Fisher Exact Test for the spatial and demographic distributions of Grave Types at Khuzhir-Nuge XIV.................197

4.5 Summary of atypical cranial treatments at Khuzhir-Nuge XIV 198

4.6 Results of two-tailed Fisher Exact Test for the spatial and demographic distributions of skeletal charring at Khuzhir-Nuge XIV 199

4.7 Summary of statistically significant results of two-tailed Fisher's Exact Test for the association of artifacts with various mortuary attributes at Khuzhir-Nuge XIV 200

5.1 Bronze Age mortuary sites in the Little Sea microregion 288

5.2 Summary of mortuary variability at Uliarba...289

5.3 Summary of grave inclusions at Uliarba...290

5.4 Distribution of artifact classes at Uliarba 292

5.5 Summary of mortuary variability at Sarminskii Mys 293

5.6 Summary of mortuary variability at Shamanskii Mys 294

5.7 Summary of grave inclusions at Shamanskii Mys 295

5.8 Summary of mortuary variability at Shide I 296

5.9 Summary of mortuary variability at Ulan-Khada II 297

5.10 Summary of mortuary variability at Ulan-Khada IV.....................................298

5.11 Summary of Bronze Age mortuary variability in the Little Sea microregion 300

5.12 Number (%) of Bronze Age graves containing artifact types.........................302

List of Figures

Figure		Page
2.1	Map of Northern Asia indicating the location of Lake Baikal	55
2.2	Map of Cis-Baikal and its major geographic features	56
2.3	Map of the Little Sea (Ol'khon) microregion	57
3.1	Map of Cis-Baikal and location of archaeological sites mentioned in text	88
3.2	Map of Khuzhir-Nuge XIV	89
3.3	Radiocarbon dates at Khuzhir-Nuge XIV sorted by collagen yield (n=79)	90
3.4	Scatterplot of collagen yield (%) vs. radiocarbon years BP at Khuzhir-Nuge XIV (n=87)	91
3.5	Radiocarbon dates and collagen yields for burials from graves with multiple interments at Khuzhir-Nuge XIV	91
3.6	Plot of calibrated high-collagen radiocarbon dates for Khuzhir-Nuge XIV (*=combined radiocarbon date)	92
3.7	Radiocarbon curve at 3900 BP	93
3.8	Modeled High Posterior Density Regions for the beginning (α) and end (β) of cemetery use when Phase 1 is excluded	94
3.9	Modeled High Posterior Density Regions for the beginning (α) and end (β) of cemetery use during Phase 4.	95
3.10	Temporal distribution of mortuary attributes at Khuzhir-Nuge XIV	96
3.11	Radiocarbon dates for Khuzhir-Nuge XIV and other post-hiatus graves in the Cis-Baikal.	97
4.1	Map of Cis-Baikal, with inset to Little Sea and Khuzhir-Nuge XIV site	166

4.2 Location of the Khuzhir-Nuge XIV cemetery (from the southwest); photo A. Weber. 167

4.3 General site plan of Khuzhir-Nuge XIV cemetery, indicating analytical clusters 168

4.4 Demographic profile of Glazkovo individuals at Khuzhir-Nuge XIV (n=88) 169

4.5 Multiple correspondence analysis map of core attributes at Khuzhir-Nuge XIV 170

4.6 Spatial distribution of child and adolescent burials at Khuzhir-Nuge XIV 171

4.7 The first excavation level of an undisturbed grave at Khuzhir-Nuge XIV; photo A. Weber 172

4.8 The first excavation level of a disturbed grave at Khuzhir-Nuge XIV; photo A. Weber 172

4.9 Burial level of a disturbed grave at Khuzhir-Nuge XIV; photo A. Weber 173

4.10 Spatial distribution of disturbed graves at Khuzhir-Nuge XIV 174

4.11 Age-at-death of individuals at Khuzhir-Nuge XIV, classified by level of grave disturbance (n=89) 17

4.12 Example of a side-by-side double burial from Khuzhir-Nuge XIV; photo A. Weber 176

4.13 Example of a stacked double burial from Khuzhir-Nuge XIV; photo A. Weber 177

4.14 Multiple correspondence analysis map of spatial cluster, age-at-death, interment in rows, and grave type at Khuzhir-Nuge XIV 178

4.15 Spatial distribution of grave types at Khuzhir-Nuge XIV 179

4.16 Example of a burial with a dislocated skull from Khuzhir-Nuge XIV; photo A. Weber 180

4.17 Example of a fully cremated burial from Khuzhir-Nuge XIV; photo A. Weber 181

4.18 Example of a partially cremated burial from Khuzhir-Nuge XIV; photo A. Weber ... 182

4.19 Spatial distribution of skeletal charring at Khuzhir-Nuge XIV ... 183

4.20 Examples of two nephrite axes (on left) from Grave No. 86 at Khuzhir-Nuge XIV; photo A. Weber ... 184

4.21 Example of a nephrite knife (second from right) from Grave No. 73 at Khuzhir-Nuge Xiv; photo A. Weber ... 184

4.22 Examples of lithic arrowheads from Grave No. 86 at Khuzhir-Nuge XIV; photo A. Weber ... 185

4.23 Examples of two lanceolate bifaces (on left) from Grave No. 87 at Khuzhir-Nuge XIV; photo A. Weber ... 185

4.24 Examples of lithic insert tools from Grave No. 82 at Khuzhir-Nuge XIV; photo A. Weber ... 186

4.25 Example of two bone points (at right) from Grave No. 14 at Khuzhir-Nuge XIV; photo A. Weber ... 186

4.26 Example of bone/antler harpoon (centre) from Grave No. 86 at Khuzhir-Nuge XIV; photo A. Weber ... 187

4.27 Example of bone/antler fishhook shanks (at right) from Grave No. 74 at Khuzhir-Nuge XIV; photo A. Weber ... 187

4.28 Example of cylindrical beads and red deer canine pendants from Grave No. 36 at Khuzhir-Nuge XIV; photo A. Weber ... 188

4.29 Spatial distribution of cylindrical beads at Khuzhir-Nuge XIV ... 189

4.30 Ground stone discs from Grave No. 42 at Khuzhir-Nuge XIV; photo A. Weber ... 190

4.31 Metal rings and Nephrite discs from Grave No. 25 at Khuzhir-Nuge XIV; photo A. Weber ... 190

4.32 Perforated roe deer phalanges from Grave No. 42 at Khuzhir-Nuge XIV; photo A. Weber ... 191

4.33 Round pebbles (centre) from Grave No. 77 at Khuzhir-Nuge XIV; photo A. Weber ... 191

4.34 Multiple correspondence analysis map of major artifact types at Khuzhir-Nuge XIV 192

4.35 Multiple correspondence analysis map of implements and spatial cluster at Khuzhir-Nuge XIV 193

4.36 Multiple correspondence analysis of unmodified animal remains and spatial cluster at Khuzhir-Nuge XIV 194

4.37 Multiple correspondence analysis map of ornaments and spatial cluster at Khuzhir-Nuge XIV 195

5.1 Map of Little Sea microregion indicating the locations of all known Bronze Age mortuary sites 265

5.2 Major culture history models and radiocarbon dates from the Little Sea microregion 266

5.3 Site plan of the mortuary site Uliarba (modified from Goriunova 1997) 267

5.4 Site plan of Uliarba illustrating the locations of graves by period (modified from Goriunova et al. 2005) 268

5.5 Site plan of Uliarba illustrating the locations of Bronze Age male and female graves (modified from Goriunova et al. 2005) 268

5.6 Site plan of Uliarba illustrating the locations of Bronze Age graves containing lithic arrowheads (modified from Goriunova et al. 2005) 269

5.7 Site plan of Uliarba illustrating the locations of Bronze Age graves containing unmodified animal remains (modified from Goriunova et al. 2005) 269

5.8 Site plan of Uliarba illustrating the locations of Bronze Age graves containing ground stone axes/adzes (modified from Goriunova et al. 2005) 270

5.9 Site plan of Uliarba illustrating the locations of Bronze Age graves containing bone needles/needle cases (modified from Goriunova et al. 2005) 270

5.10 Site plan of Uliarba illustrating the locations of Bronze Age graves containing ground stone rings/discs (modified from Goriunova et al. 2005) 271

5.11 Site plan of Uliarba illustrating the locations of Bronze Age graves containing fishing gear (modified from Goriunova et al. 2005) 271

5.12 Site plan of Uliarba illustrating the locations of Bronze Age graves containing lithic flakes/blades (modified from Goriunova et al. 2005) 272

5.13 Site plan of Uliarba illustrating the locations of Bronze Age graves containing metal artifacts (modified from Goriunova et al. 2005) 272

5.14 Site plan of Uliarba illustrating the locations of Bronze Age graves containing nephrite knives (modified from Goriunova et al. 2005) 273

5.15 Site plan of Uliarba illustrating the locations of Bronze Age graves containing ground stone discs and rings (modified from Goriunova et al. 2005) 273

5.16 Site plan of Uliarba illustrating the locations of Bronze Age graves containing red deer canine pendants (modified from Goriunova et al. 2005) 274

5.17 Site plan of the mortuary site Sarminskii Mys (modified from Goriunova 1997) 275

5.18 Site plan of the mortuary site Kurma XI 276

5.19 Photograph of Kurma XI excavations in progress; photograph A. Weber) 277

5.20 Photograph of Kurma XI from the south (photograph A. Weber) 277

5.21 Photograph of the nephrite lunar pendant from Grave No. 12 at Kurma XI (photo credit: A. Weber) 278

5.22 Site plan of the mortuary site Khadarta IV (modified from Kharinskii and Sosnovskaia 2000) 279

5.23 Photograph of Shamanskii Mys (photo credit: A. Weber) 280

5.24 Site plan of the mortuary site Shamanskii Mys illustrating the location of graves by period 281

5.25 Site plan of the mortuary site Shamanskii Mys illustrating the location of Bronze Age male and female burials 282

5.26 Site plan of the mortuary site Shide I (modified from Gorbunova and Pshenitsyna 1986) 283

5.27 Site plan of the mortuary site Shrakshura II (modified from Goriunova 1997) 284

5.28 Site plan of the mortuary site Khalurinskii Mys I (modified from Goriunova 1997) 285

5.29 Map illustrating the location of Sagan-Nuge mortuary site (modified from Baruzdin et a. 1996) 286

5.30 Site plan of the mortuary site Ulan-Khada IV (adapted from Komarova and Sher 1992) 287

Chapter 1
Introduction

1.1 INTRODUCTION

Over the last 100 years, research in the Lake Baikal region of Siberia, Russia, has documented an extraordinary wealth of archaeological remains dating as far back as 20 000 years (e.g., Medvedev 1969). Particularly exceptional are the hundreds of hunter-gatherer cemeteries dating between the Late Mesolithic and Bronze Age (~7000–1000 BC). Such remains are unusual for Siberia and, indeed, for hunter-gatherers across most of the northern world. As such, this material provides a unique opportunity to investigate culture dynamics among prehistoric foragers. Unfortunately, after A.P. Okladnikov's (1950, 1955) groundbreaking synthesis published in the 1950s, Lake Baikal archaeologists turned away from interpretations of social dynamics and culture change to focus instead on questions of typology and chronology (Weber 1994, 1995). As a consequence, for the last 50 years, Cis-Baikal mortuary sites have been investigated primarily as repositories of typological traits for defining culture-historical sequences. Beyond assigning cemeteries to particular periods or mortuary traditions, therefore, there has been little discussion of the meaning of intrasite mortuary variability, the extent to which contemporaneous sites resemble each other, or how such sites might have been articulated within a broader cultural context. The objective of this study, then, is to explore variation in mortuary practices both within and between Cis-Baikal cemeteries from a perspective that considers such sites as meaningful places created through dynamic social processes. More specifically, the research described here examines mortuary variability at 20 Bronze Age cemeteries from the Little Sea microregion of the Cis-Baikal. These data were obtained from both original excavations and existing literature, and they were collected under the auspices of the Baikal Archaeology Project (BAP)—a multidisciplinary and international research team that is investigating processes of prehistoric culture change and continuity in the region.

The foundations for BAP lie in Weber's (1995) identification of a previously unrecognized c.700-year hiatus in radiocarbon dates during the fifth millennium BC that separates the Early Neolithic from the Late Neolithic (Weber 1995; Weber et al. 2002)[1]. Within the context of this chronological model, BAP was designed to define the biocultural parameters of the populations on either side of the hiatus. Initial results from this program, which were derived primarily from the archaeometric analysis of human remains, demonstrate that the pre- and post-hiatus groups were not only genetically dissimilar but also differed with respect to such characteristics as dietary preferences, mobility patterns, population size and distribution, and aspects of mortuary ritual (e.g., Ezzo et al. 2003; Katzenberg and Weber 1999; Lam 1993; Link 1996, 1999; Mooder et al. 2003; Mooder et al. 2005, n.d., Schurr 2003; Weber and Katzenberg 1998; Weber et al. 2002, 2003, 2005). Having defined these parameters, BAP's current goal is to understand better the processes resulting in the observed biocultural discontinuity. In particular, one of the stated goals is to establish "the mechanisms underlying the development and abandonment of large formal cemeteries in Cis-Baikal during the Early Neolithic and Late Neolithic/Bronze Age (Weber 2005)." It is in this context that the

[1] In Weber (1995) the radiocarbon gap was described as separating the Early Neolithic from the Middle Neolithic; however, Weber et al. (2002) following Link (1999) revised this terminology such that the hiatus was identified with the Middle Neolithic.

research described in this dissertation was initiated (see also Weber 1994; Weber and Baziliiskii 1996).

The general approach to mortuary analysis adopted in this dissertation follows Goldstein (1981) in accepting that mortuary variability is multidimensional, and that one productive way to examine the relationships between these dimensions is to employ the spatial representation of death as an organizational framework (see also papers in Beck 1995 and Silverman and Small 2002). In addition, as noted above, this research is guided by a general concern with exploring cemeteries as meaningful places that manifest both intra- and intersite relationships. As such, it is accepted here that comprehensive analysis of mortuary variability must involve multiple spatial and temporal scales of analysis (e.g., Cannon 2002; Chapman 2005). Accordingly, this study will, for the most part, follow a "bottom-up approach" (Chapman 2005:38), in which mortuary variability is examined first at individual sites and then within the larger regional context.

1.2 ORGANIZATION OF DISSERTATION

Chapter 2 provides the background for the physical and archaeological contexts in which the research presented in this dissertation takes place, as well as additional details of the general theoretical and methodological approaches employed. Given the multiscalar emphasis of the described research, and the fact that each scale of analysis requires unique treatment, it was most effective to present the analytical portion of this dissertation as four individual research studies (Chapters 3–6), each with its own specific approach, methods, and materials. Chapter 3 examines both new and existing radiocarbon dates to establish chronological patterns of cemetery use at both local and regional scales of analysis. Chapter 4 consists of a detailed examination of local mortuary variability at the recently excavated Khuzhir-Nuge XIV (KN XIV) cemetery located in the Little Sea microregion. In Chapter 5, 19 additional Bronze Age cemeteries from the same area are surveyed in order to evaluate the extent to which the structure of mortuary variability observed at KN XIV is repeated at other mortuary sites in the region. Following these three somewhat descriptive studies, Chapter 6 proposes one means of synthesizing the Bronze Age mortuary record through the application of Cannon's (2002) theoretical framework in which the spatial representation of death is linked to distinctions between different types of memory. Finally, Chapter 7 summarizes the results of this dissertation and presents some general comments on future research directions.

1.3 SIGNIFICANCE OF RESEARCH

The research presented in this dissertation has scholarly importance for a number of reasons. First, it presents data that help clarify chronological patterns of cemetery use at both local and regional scales of analysis, as well as the extent to which radiocarbon dating is useful for evaluating such patterns. This study also presents some new perspectives on the methodology of interpreting large sets of radiocarbon dates.

Second, BAP's recent excavation of KN XIV provides the opportunity to begin the long overdue reevaluation of the Cis-Baikal mortuary data (Weber 1994, 1995; Weber and Baziliiskii 1996). In particular, this dissertation represents a preliminary attempt to reorient the study of Cis-Baikal mortuary practices away from typological questions to instead consider problems of social, political, economic, and ideational aspects of life. As such, it contributes to the general improvement of our understanding of the region's Middle Holocene culture dynamics.

Next, this research provides an excellent case study for the utility of the spatial dimension of death as an organizing framework. Likewise, this study is an effective demonstration of the necessity of multiscalar analysis for comprehensive investigations of mortuary practices.

The final significance of this dissertation is more pragmatic: it introduces the Western academic community to a small portion of the wealth of archaeological material that exists in the Cis-Baikal and that continues to reside, with only few exceptions, in Russian language reports that are difficult to access outside of Russia. Both Goriunova et al. (2004:3) and Baziliiskii (2003:49) note that perhaps the highest priority in Cis-Baikal archaeology is the publication and discussion of previously excavated material. The geopolitics of the Cold War era contributed to a geographical bias against non-Russian anthropological research in Siberia that until quite recently prevented sustained research. The lack of foreign research in the region should not, however, be confused with a lack of research in general. The Russian archaeological community has a long, rich, and distinguished history that deserves much wider recognition. The same can be said of the lives of the Middle Holocene hunter-gatherers who inhabited this unique part of the world.

1.4 TERMINOLOGICAL CONVENTIONS

I will conclude this introductory chapter by detailing some of the necessary terminological conventions that are used throughout this dissertation.

First, it is important to recognize that for Siberian archaeologists, the term *Neolithic* refers to the period between the introduction of pottery and the introduction of metallurgy, rather than to the adoption of animal and plant domestication as it does in other parts of the world. Both the Neolithic and the Bronze Age peoples discussed in this dissertation were hunting-gathering-fishing cultures and, so far as we know, did not engage in any animal husbandry or horticulture.

Second, after the initial instance in each chapter, the Baikal Archaeology Project is referred to by its acronym BAP. Likewise, the site of Khuzhir-Nuge XIV, which is discussed extensively throughout the study, is shortened to KN XIV.

Third, with reference to radiocarbon dates, BP (before present) refers to uncalibrated radiocarbon ages, while BC (before Christ) denotes calibrated radiocarbon dates. The terms radiocarbon and ^{14}C are used interchangeably.

Fourth, the terms *grave* and *burial* are not used as synonyms in this study. Instead, *grave* is used to denote the physical structure within which the *burial*, or individual, is interred. Further details on this distinction are provided in the general discussion of materials in Chapter 2.

Next, the United States Library of Congress System (without diacritical marks) is used to transliterate Russian words and phrases into English except in cases where older spellings have become accepted standards (e.g., Sayan mountain range rather than

Sayany mountain range). Similarly, transliterated Russian words are always italicized except for proper nouns such as city names (e.g., Irkutsk), archaeological sites or cultures (e.g, Kitoi), or names of researchers (e.g., Okladnikov). In cases where the names of Russian authors have been transliterated differently in different publications (e.g., Bazaliisky, Bazaliiskii, Baziliskii) I am obliged to retain the diverse spellings. Translated Russian phrases are indicated by square brackets following the first instance in the text, from which point only the English translation is used (e.g., *Maloe More* [Little Sea]). Because Russian adjectives grammatically decline, the names of mortuary traditions and sites are often transliterated and translated differently in different contexts. For example, the Russian word *traditsiia* [tradition] is feminine, and so requires that any modifying adjective take the feminine ending *–aia* or *-iaia*. The word *obriad* [ritual], in contrast, is masculine and so requires adjectives ending in *–ii* or *-oi*. As such, in Russian it is proper to talk about a *Glazkovsk<u>aia</u> Traditsiia* but a *Glazkovsk<u>ii</u> Obriad.* The English convention, which is followed in this dissertation, is to ignore these adjectival endings and to use only the name of the site from which the tradition takes its name (e.g., Glazkovo Tradition, Glazkovo Ritual).

Finally, in order to remain consistent with the literature of the region, European rather than North American terminology is used to describe flora and fauna, followed by the Latin scientific name in parentheses. For example, I refer to *Cervus elaphus* as red deer rather than elk and *Alces alces* as elk, not moose. In cases where familiar English names do not exist, common Russian terms are simply transliterated rather than translated. For example, *taimen'* (*Hucho taimen* Pallas), *lenok* (*Brachymystax lenok* Pallas), and *omul'* (*Coregonus autumnalis migratorius* Georgi) are all widely known Russian terms for fishes that do not have commonly used English equivalents. The familiar Russian term *suslik* is also used to describe the Eurasian ground squirrel *Citellus citellus*.

Chapter 2
Context and Approach

This chapter begins by outlining the physical context of the Cis-Baikal, which is an important component of existing accounts of prehistoric hunter-gatherer life in the region. Second, I review the history of archaeological research in the area, including the current state of knowledge with respect to the region's Middle Holocene populations. This history provides both the justification for the current research, and the background against which conclusions derived in this study will be compared. Next, I present the general theoretical and methodological approach as well as briefly describe the materials used in this dissertation.

It should be noted that although this study focuses on Bronze Age mortuary sites from a single microregion within the Cis-Baikal, the background provided in this chapter is somewhat broader in both spatial and temporal terms. This more general approach was necessary owing to both the history of research in the region and the extensive similarities noted between the various culture groups through time and across space. In fact, in order to avoid unnecessary repetition, many of the specific details surrounding the particulars of the Bronze Age culture-history debate in the Little Sea microregion are not presented until Chapter 5, where they can be more meaningfully related to the relevant discussion.

2.1 PHYSICAL CONTEXT

Weber (2003) has already summarized much of the available literature on the geology, climate and biology of the region, especially the important work of Kozhov (1950, 1963, 1972), to produce a general biogeographic profile of the Cis-Baikal. Galazii (1993) and Shahgedanova (2002) also provide excellent reviews. As such, I will summarize these existing works here, with other sources noted where appropriate.

2.1.1 *Physiography*

Michael (1958:5) defines the Cis-Baikal as that area of Eastern Siberia falling between 52°N and 58°N latitude and 101°E and 110°E longitude, which includes the islands and western shore of Lake Baikal, as well as the drainage basins of the Angara and Upper Lena rivers down to the cities of Ust'Ilimsk and Kirensk respectively (Figures 2.1 and 2.2). The region to the south and east of the lake is termed the Trans-Baikal, and together with the Cis-Baikal it makes up the Baikal Mountain Region. Mountains play a large part in defining both the borders and topography of the Cis-Baikal. The Primorskii (1100–1700 m) and Baikalskii (1100–2650 m) mountain ranges circumscribe the northwest coast of Lake Baikal, while the higher Eastern Sayan (3000–3200 m) range lies to the west of the southwest tip of the lake and defines the Cis-Baikal's southwest corner. All of these ranges are composed of Archaean and, to a lesser extent, Proterozoic and Paleozoic material. To the north and west of the mountain ranges lie the foothills (400–1100 m) that make up part of the Paleozoic Central Siberian Plateau. The Angara and Upper Lena rivers and their tributaries intersect these hills and expose Cambrian, Ordovician and Mesozoic material. As I discuss below, the varied lithological regimes in the Cis-Baikal have allowed researchers to examine hunter-gatherer mobility patterns through the analysis of stable isotope data recovered from bones and teeth.

Baikal's largest island, Ol'khon, divides the lake into the open and deep *Bolshoe More* [Big Sea] and the sheltered, shallow *Maloe More* [Little Sea] (Figure 2.3). Collectively, Ol'khon Island, the Little Sea, and approximately 120 km of the lake's northwest coast directly west from the island make up the Little Sea microregion (also known as the Ol'khon microregion), within which all of the mortuary sites described in this dissertation are located. The southern part of the Little Sea's mainland coast is defined by shallow bays and coves that are among the most productive littoral fish habitats on the entire lake (Kozhov 1963). North of the Little Sea, however, the coast is much steeper with mountainous cliffs defining the shoreline, and less than 50km northwest of these sheltered bays the Primorskii and Baikalskii peaks reach their highest elevations. The distinct topography of the Little Sea microregion contributes to its unique steppe and steppe-forest ecology (see below).

Between 1950 and 1977 the construction of three hydroelectric dams on the Angara River, which is Lake Baikal's only outlet, at the cities of Irkutsk, Bratsk and Ust'-Ilimsk, caused the lake's water level to rise approximately one meter, increasing its surface area by around 500 square kilometers (~1.5% increase). While this increase did not significantly affect the steep western lakeshores, it did flood a number of wetland areas and modern settlements, especially on the northern and southern shores. It also depleted forests in some areas due to inundation (Brunello et al. 2003). The change in water level had a much greater effect on the Angara where dam reservoirs were created and thousands of square kilometers were flooded, including the valleys of many of the Angara's tributaries. Although a number of reconnaissance surveys were organized before the construction of the dams to mitigate the loss of archaeological material (see below), numerous sites were lost through flooding. As discussed below, the dam reservoirs also significantly changed the Angara fish ecology (Brunello et al. 2003).

2.1.2 *Climate*

Although Lake Baikal has, over the last decade, become an important centre of paleoclimate research in Asia (e.g., Colman et al. 1995, 1996, Demske et al. 2005; Kashiway et al. 2003; Kuzmin et al. 1993, 2000; Williams et al. 2001), the large size of the lake means that climatic reconstructions derived from its sedimentary records are likely more reflective of average environmental changes across the broader region, rather than providing any specific local signature. A number of more localized studies have been conducted on a variety of paleoecological data from peat bogs, swamp sites and small lakes in the surrounding regions; however, to date, the results of these studies are difficult to reconcile. White has conducted a comprehensive review of this material and concludes:

> While these studies add significant new details to the climatic history of the area, insufficient spatial and temporal resolution in available datasets remain a primary limiting factor in both continental and sub-regional syntheses. In addition, inconsistencies in both the quality and resolution of field data combined with the multitude of different types of proxy sources used for environmental reconstructions present inherent challenges in establishing accurate site age models and sound climatic interpretations. At a continental scale, these problems are compounded in that data also indicate asynchronous or time-transgressive climatic trends across the broader region

> during the Holocene. Discordance among these records is not surprising given the noted problems inherent in interpreting complex field data, the vast size of the area, the differing influences of prevailing atmospheric circulation patterns, and the diversity in topography and associated vegetation complexes. With relatively few high resolution site records available from the region, additional investigations of local-scale environmental sequences are still widely needed before more meaningful sub-regional and pan-regional models can be adequately developed. [White n.d.]

The construction of detailed local climatic models for Holocene Cis-Baikal is one of the primary goals of the Baikal Archaeology Project (BAP). In particular, BAP is currently integrating numerical climate modeling simulations with a variety of high-resolution paleoenvironmental proxy data including pollen, diatoms, and carbon and oxygen isotopes from both salt lakes and terrestrial floodplain contexts (Weber 2005). This research, along with White's (n.d.) upcoming doctoral dissertation, which describes geomorphological changes as well as associated macrofossil sequences (e.g., land and freshwater molluscs, and vertebrates), should help to clarify the situation in the near future. Overall, however, we can say that between 5000 and 3000 BP the climate of Cis-Baikal began to approximate contemporary conditions. Thus, it is useful to discuss the modern context in order to create a baseline from which to estimate the potential range of ecological diversity that would have existed during the Middle Holocene.

In general, the region's contemporary climate is typical of boreal regions and is markedly continental. Long, cold, dry winters alternate with short, warm and somewhat wet summers reaching average temperatures of approximately –17°C in January and 20°C in July (http://meteo.infospace.ru/climate/html/index.ssi). Unlike some parts of the Trans-Baikal, most of the Cis-Baikal is free from continuous permafrost, although discontinuous permafrost is found near the northern tip of the lake and pockets of continuous permafrost are found on the east side of the Upper Lena (Smith 2001). Where permafrost does not exist, the ground freezes in winter to a depth of between 120 cm and 220 cm below an average of 30–80 cm of snow cover. The lake itself freezes for four months during winter and retains ice in its northern half until at least June. The lake also acts as an enormous thermal reservoir resulting in a microclimate that is approximately 7–10°C cooler in the summer and 7–10°C warmer in winter than in surrounding regions. Consequently, the warmest month on the Baikal coast is August rather than July. The Upper Lena, by contrast, tends to be a few degrees colder in winter than the region's average.

Prevailing wind patterns around Lake Baikal exhibit a coastal tendency and blow cold air from the land to the lake during the winter and from the lake to the land in the summer (Galazii 1993). A number of particularly severe mountain winds, each with its own name (e.g., *Verkhovik, Gornyi, Barguzin, Kultuk*), can arise suddenly over the lake from the Primorskii and Baikalskii ranges and last anywhere from hours to days (Galazii 1993). The Little Sea microregion is home to one of the strongest of these winds, the *Sarma*, which can reach speeds of 40 m/s and cause waves as high as 5.5 m in the centre of the lake (Galazii 1993). These winds have prevented the deposition of sediment in much of the Little Sea microregion, which permits many Middle Holocene sites to be seen on the modern surface. Sites located on west and northwest facing slopes, on the other hand, are often buried under considerable aeolian sediment.

Annual precipitation in the Cis-Baikal averages approximately 300–400 mm falling mostly between mid-May and late September with a maximum in July and August. The area of the Eastern Sayan is the wettest with as much as 1000 mm annually, while the Little Sea microregion is the driest with as little as 160–190 mm. The lack of precipitation in the Little Sea microregion led to the formation of a steppe and steppe-forest environment along both coasts in the southern half of the Little Sea, as well as a few mainland pockets immediately south of this area. The open environment in these parts of the Little Sea microregion contributes to the increased visibility of archaeological materials relative to the Angara and Upper Lena microregions.

2.1.3 *Flora and Fauna*

The Cis-Baikal is currently located within a middle to southern taiga and, in the south, a transitional steppe-forest ecotone. Although the flora and fauna of the Cis-Baikal are generally typical of southern boreal regions worldwide (e.g., Pruitt 1978), the diverse topography and varied microclimates of the region have led to the establishment of a number of different vegetation zones. The Angara basin, for example, consists of mostly pine (*Pinus* sp.) and larch (*Larix* sp.) forests, while the Upper Lena taiga is characterized by mostly larch with some pine (Galazii 1993). In between these two basins, fir (*Abies* sp.) and Siberian pine (*Pinus sibirica*)[1] tend to dominate. Above the treeline, in the Eastern Sayan and Baikalskii Mountains, the vegetation is more characteristic of alpine tundra with mosses, lichens, willow and grasses. In between the taiga and tundra regions, a transitional zone exists with both alpine meadows and forests of birch (*Betula sp.*), Siberian pine, alder (*Alnus* sp.), and larch, with rhododendron (*Rhododendron dahuricum*) and honeysuckle (*Lonicera*) often comprising the undergrowth (Galazii

[1] In Russia, the Siberian pine (*Pinus sibirica*) is commonly referred to as *Sibirskii Kedr* [Siberian Cedar] and is discussed separately from other pine species. This has led to some confusion for non-Russian scholars, and references to "cedar" in English translations usually refer to this tree or other related pines rather than to true cedars (*Cedrus* sp.), which are not found in the Baikal region.

1993). Meadows and marshes are also present in the Cis-Baikal, mostly on the banks and terraces of the larger river valleys. Finally, as mentioned, steppe and steppe-forest landscapes exist on the southwest half of Ol'khon Island and the surrounding coasts of the mainland as well as much of the first 380 km of the Angara valley. The Kuda river valley, which connects the Angara and Upper Lena valleys, is also largely defined by a steppe ecology (Galazii 1993). The Siberian pine is worth singling out as an important resource since it produces abundant thinly shelled nuts (commonly referred to as "cedar nuts") that would likely have provided food and oils for local populations.

Similar to plants, there is a noticeable reduction in the diversity of animal species in boreal regions when compared to southern environments (Pruitt 1978); however, the heterogeneity of topographic and climatic conditions in the Cis-Baikal also permits more faunal diversity than is common for many northern contexts. Rather than describing the full extent of the distribution of these species in the Cis-Baikal, I will only focus on those animals that likely formed a significant part of the resource base for resident human populations.

As with most northern environments, ungulates provide the major source of potential food resources in the Cis-Baikal. In particular, the remains of red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus pygargus*), elk (*Alces alces*) and reindeer (*Rangifer tarandus*) are common at Cis-Baikal habitation sites (e.g., Konopatskii 1982; Okladnikov 1950, 1955). Musk-deer (*Moschus moschiferus*) and the Siberian mountain goat (*Capra sibirica*) were also probably used in the highland taiga and mountain regions respectively. Fur would have been harvested from smaller mammals including otter (*Lutra lutra*), sable *(Martes zibellina*), hare (*Lepus timidus*), Siberian polecat *(Martes* *sibiricus*), fox (*Vulpes vulpes*), and ermine (*Martes erminea*). Omnivores and carnivores in the region, such as the brown bear (*Ursus arctos*), wolf (*Lupus lupus*), lynx (*Felis lynx*), and wolverine (*Gulo gulo*), were likely not important sources of food and may or may not have been sources of fur; however ethnographic accounts of northern hunter-gatherers indicate that many of these animals are important spiritual resources. Forsyth, for example, notes that "[f]or the Khantys and Mansis, as for all Siberian (and North American) native peoples, the brown bear occupied a unique position among animals. It was considered to be the embodiment of justice on earth and, as 'master of the forest' . . . (1992:25)." In archaeological contexts, carnivore mandibles and teeth are not uncommon as grave inclusions (e.g., Okladnikov 1950, 1955), and Bazaliiskiy and Savelyev (2003) describe the burial of a wolf within a grave previously occupied by a person at the Early Neolithic site of Lokomotiv on the Angara River.

In addition to terrestrial fauna, aquatic resources were important for the human residents of the Cis-Baikal (Weber et al. 2002). Weber (2003) summarizes the distribution and variability of aquatic food resources between the three basins (Lake Baikal, Angara River, Upper Lena River) and my discussion relies on this work unless otherwise cited. Lake Baikal contains approximately 50 species of fish; however, as we would expect in a lake as large, deep, and topographically varied as Baikal, the distribution of resources is far from homogeneous. Kozhov (1963, 1972) divides Lake Baikal into five ecological zones on the basis of coastline, relief and depth of bottom, and distance from larger rivers. Very different aquatic communities characterize each zone of the lake, but for the purposes of the proposed research, the Ol'khon (Little Sea) zone is the most important.

The Little Sea is among the richest areas of Lake Baikal in both perennial littoral fishes including whitefish (*Coregonus lavaretus baicalensis* Dybowski), perch (*Perca fluviatilis*), northern pike (*Esox lucius*), ide (*Leuciscus idus*), dace (*Leuciscus leuciscus baicalensis* Dybowski), roach (*Rutilus rutilus lacustris* Pallas), and Baikal black (*Thumallus arcticus baicalensis* Dybowski) and white grayling (*Thymallus arcticus baicalensis brevipinnis* Svetovidov), as well as the important seasonal pelagic fish *omul'* (*Coregonus autumnalis migratorius* Georgi). Also important in Lake Baikal is the endemic Baikal seal (*Phoca sibirica*). Archaeological evidence suggests that Middle Holocene people hunted seal during the spring when the animals come together into colonies to sun bask on ice (Pastukhov 1993; Weber et al. 1993, 1998).

The Angara River, flowing out of Lake Baikal, is part of the Yenisei River drainage system that flows north into the Arctic Ocean. Following Kozhov (1950), the Angara can be divided into four sections beginning at Lake Baikal. The upper section of the Angara, between the lake and the Irkut River, is lacustrine influenced and contains predominantly Baikal black grayling, with a small percentage of *lenok* (*Brachymystax lenok* Pallas) and *taimen'* (*Hucho taimen* Pallas). The second section, from the Irkut confluence to around the city of Bratsk, is more diverse in fish species owing to the influx of waters from a number of tributaries including the Irkut, the Kitoi, the Belaia, and the Oka. Present in these waters are Siberian dace, arctic grayling (*Thymallus arcticus* Pallas), perch, northern pike, burbot (*Lota lota*), roach, humpback whitefish (*Coregonus pidschan* Gmelin), *lenok*, and *taimen'*. The third section of the Angara, and final section of relevance for this study, extends to just below the Ilim River and contains humpback whitefish, Siberian sturgeon (*Acipenser baerii* Brandt), Siberian sterlet (*Acipenser *ruthenus ruthenus* Brandt), Siberian dace, and arctic grayling. It is important to note that that Kozhov's research (1950) was conducted before the installation of the dams at Irkutsk, Bratsk and Ust'Illimsk, which, as previously mentioned, seriously altered the Angara fish ecology. In particular, the altered river currents and concentrated pollution from pulp and paper mills caused many riverine species to be replaced by lacustrine and eutrophic lacustrine species such as roach, perch, pike (Weber 2003). The dams also changed terrestrial migration patterns, including those of people, by flooding huge areas that were previously used as transportation corridors (Forsyth 1992:376).

Compared with Lake Baikal and the Angara, relatively little is known about fish resources from the Upper Lena; however, Kozhov (1950, 1963, 1972) estimates that the productivity of the Upper Lena, both in abundance and diversity, is quite low compared to these other areas.

2.2 HISTORY OF ARCHAEOLOGICAL RESEARCH IN CIS-BAIKAL[2]

It is useful to divide the history of archaeological research in the Cis-Baikal into four stages. The first stage consists of the early exploratory research conducted in the region beginning in the late 1800s and includes Vitkovskii's (1880, 1889) important excavations at the eponymous Kitoi type-site. The second stage begins in 1912 with the arrival of B.E Petri, who was the first scholar in the region whose primary interest was ethnography and archaeology. Petri's work, and that of his numerous students, marks the beginning of

[2] Much of the information in this section is derived from the excellent histories provided by Okladnikov (1950), Savel'ev (1989) and Svinin (1992); other sources are cited where appropriate. For more general summaries in English see Chard (1958, 1974), Michael (1958, 1992a, 1992b) and Weber (1995).

professional archaeology in the Cis-Baikal. Especially important was the research of his student A.P. Okladnikov, whose influential two-volume monograph published in 1950 and 1955 marks the end of this stage of research. Okladnikov's research not only summarized the work that had been accomplished in the region until that point, but it also provided the area's first truly comprehensive synthesis. This publication is, by far, the most important work in the history of Cis-Baikal archaeology and provides the foundations for all subsequent investigations in the region including contemporary research. The third stage represents the research conducted after the publication of Okladnikov's synthesis until the introduction of radiocarbon dating in the Cis-Baikal during the late 1980s, and is characterized by a vigorous debate regarding the region's culture-history. The final stage consists of our contemporary understandings of Middle Holocene life in the region, which has been influenced largely by the introduction of radiocarbon dating as well as other new methodological and theoretical developments.

2.2.1 *Early Research: 18th Century–1912*

Scholars have been aware of the Cis-Baikal's extraordinary wealth of archaeological materials since at least the times of Peter the Great (Strahlenberg 1730), and what may be considered archaeological research began here as early as the late nineteenth century (e.g., Agapitov 1882; Anuchin 1879; Stanilovskii 1902; Vitkovskii 1880, 1881, 1882, 1889). The Polish geologist I.D. Cherskii (1880, 1895), who was exiled to Siberia in 1863, was responsible for discovering and describing numerous archaeological sites during his survey of the Baikal coast, including Iron Age slab graves and stone walls.

Around this same time, N.N. Agapitov was elected to Head of the East Siberian Department of the Russian Geographical Society, and he began to focus on archaeological and ethnographic research. Agapitov (1882) surveyed much of the area, including several of the areas first identified by Cherskii. In his publication "Cis-Baikal Antiquities," Agapitov (1882) provided detailed descriptions of a range of surface materials including fortified settlements, cemeteries, stone walls, and rock paintings. He also documented some of the first excavations in the region.

Likely the most important work conducted during this period was Vitkovskii's (1880, 1881, 1882, 1889) discovery and excavation of the Kitoi cemetery. This site remains the only Early Neolithic cemetery published in full, and so it continues to be the type-site for defining mortuary practices of the "Kitoi culture" (see below).

Early in the 20th century the number and range of archaeological materials collected in the region grew substantially, largely through the work of the botanist turned museum conservationist A.M. Stanilovskii (1912). In 1912, B.E. Petri was sent to Irkutsk from St. Petersburg by the Russian Committee for the Study of Middle and East Asia, which marks the beginning of a new period of research.

2.2.2 *B.E. Petri and A.P. Okladnikov: 1912–1955*

B.E. Petri was the first scholar in the Baikal area whose primary training and research interest was archaeology and ethnography, and as such he should be considered the region's first professional archaeologist. Perhaps his most important research contribution was the discovery and excavation of the multi-layered habitation site, Ulan-Khada, on the northwest shore of the Lake Baikal's Little Sea. At the time it was excavated, Ulan-Khada was the first stratified site in Siberia to cover the entire Neolithic, and it sparked enormous interest and discussion among both local and regional archaeologists (Svinin 1992). The site's excavation in 1912 and 1923 (Petri 1914, 1916a) was exceptional for its time and included extensive photography, mapping, and screening of sediments excavated from eleven 25 cm levels (Petri 1914, 1916a, 1916b). In later years, Petri expressed his belief that Ulan-Khada could be used as a standard with which to date other sites in the Cis-Baikal as well as to identify links between Siberia and Western Europe (Petri 1921). Indeed, Petrie based most of his subsequent chronological assumptions on the Ulan-Khada material, an approach that is still followed by many contemporary researchers (e.g., Goriunova 1984; Goriunova and Khlobystin 1992). Svinin argues that Petri's over reliance on Ulan-Khada as a chronological type-site was largely the result of his adherence to a unilinear evolutionary theoretical framework: ". . . thus it was sufficient for Petri to develop a scale for one region (for example, the Baikal area) and apply it to other regions of Siberia as well as to use it for examining parallels with Western Europe (Svinin 1992:126 translated by HGM)." Later research demonstrated that Petri's links between Siberia and Western Europe were inaccurate (e.g., Okladnikov 1950, 1955); however, it should be noted that his work was among the first to attempt a comprehensive description of the Neolithic in Siberia, and that current scholars continue to date regional mortuary sites through typological similarities with material from Ulan-Khada (e.g., Goriunova 1984; Goriunova and Khlobystin 1992).

Unfortunately, the October revolution interrupted Petri's work and he never published a full site monograph for Ulan-Khada, although he did summarize the material in a single short publication (Petri 1916a). While this article was limited to a preliminary description, it was still influential in that it provided one of the first typological analyses of Neolithic ceramic technology and decoration for Siberia. Such typological analyses of ceramic material continue to provide one of the primary means of establishing chronological control in the Cis-Baikal.

During early Soviet times, the Cis-Baikal saw another increase in archaeological research, and Petri was again at the centre. In 1918, Alexander Kolchak, who was then leader of the White Russian anti-Bolshevik forces in Siberia, established a university in Irkutsk. Petri was selected to start a program of Ethnology and Archaeology and, for the next few years, Petri and his students conducted a number of large excavations (e.g., Gorodtsov 1924; Khoroshikh 1924; Titov 1926; Tolstikhina 1924). After Kolchak's forces were put down by Bolshevik Troops in 1920, ending the Siberian Civil War, archaeological research expanded even more quickly, and many of the region's most important sites were discovered during this period (e.g., Fofanovo, Bol'shie Koty). An important stimulant for the increased fieldwork was the plan to construct a series of hydroelectric dams on the Angara river, which, as discussed above, threatened to flood extensive areas. In response, a number of Petri's students including Sosnovskii, Okladnikov and Gerasimov surveyed the Angara valley between 1932 and 1940 (Svinin 1992).

This was also the period during which the first attempts were made to classify the abundant material into meaningful culture-historical frameworks (Debets 1930; Gorodtsov 1927, 1935; Khoroshikh 1924; Konstantinov 1929; Ovchinnikov 1904; Petri 1923, 1923a, 1926, 1928). Since most of these early models were based on extremely incomplete and dispersed data (Michael 1958:9, 25–28) they will not be discussed here. The extensive work of A.P. Okladnikov was a notable exception.

While several scholars had previously attempted to summarize the abundant Cis-Baikal material, Okladnikov was the first to truly synthesize the data. It is important to note that this work was conducted as part of his doctoral dissertation research in the 1930s, but the interruption of World War II delayed its publication until the 1950s (Okladnikov 1950, 1955). Although hindsight reveals certain problems with Okladnikov's conclusions (see below), it is impossible to overstate his influence.

In brief, based primarily on a typological analysis of ~270 graves, Okladnikov organized the Cis-Baikal Neolithic and Early Bronze Age into a sequence of four main archaeological cultures: the Isakovo, the Serovo, the Kitoi, and the Glazkovo. Okladnikov assumed that the Glazkovo were youngest because of their use of metal, while the Isakovo were oldest because of their relatively simple lithic tools and crude pottery. The Serovo and Kitoi were placed in the middle based on similarities with the Isakovo and Glazkovo respectively, as well as based on their relative levels of complexity. Using the archaeology of the Northwest Coast as an analogue, Okladnikov observed that the Kitoi exhibited much greater social complexity than the Serovo, as evidenced by their relative levels of social inequality and reliance on fishing technology, and so must have developed later. The absolute chronology of this sequence was based on typological comparisons with adjacent regions.

In social terms, Okladnikov conceived of this sequence as an evolutionary progression from an egalitarian, matrilineal, hunting way of life (Isakovo) to a more socially differentiated, patrilineal, fishing lifestyle (Glazkovo). In particular, Okladnikov believed that the shift to an intensive fishing mode of production, beginning with the Kitoi and culminating with the Glazkovo, resulted in the elevation of the status of men and a corresponding decline in the status of women. Ultimately, the entrenchment of these relative status differences resulted in a complete shift from matriarchal to patriarchal social organization. As evidence for the change in relative status between men and women through time, Okladnikov pointed primarily to the greater gender diversity in quantity and quality of goods in Kitoi and Glazkovo graves compared to Isakovo and Serovo graves. The shift from hunting to fishing modes of production was also largely interpreted through analysis of grave goods and, specifically, from the decreasing proportion of projectile points to fishhooks through time.

Perhaps the most remarkable aspect of Okladnikov's work, at least for Western readers unfamiliar with Soviet scholarship, is that he not only outlined a typological chronology, but he also related variation in mortuary practices to socio-political and economic organization. He also developed a model for culture change that gave explicit priority to internal socio-economic and technological stimuli rather than external cultural diffusion or environmental changes. In this respect, Okladnikov and other Soviet archaeologists long anticipated theoretical developments that would not become generally adopted in the West until the introduction of the New Archaeology in the 1960s (Mongait 1961; Trigger 1989:207–243). Unfortunately, these theoretical advances were also constrained by their compulsory adherence to a rigid Soviet-Marxist intellectual framework (Trigger 1989:207–243; Weber 1994; Weber and Baziliiskii 1996). Indeed, the evolutionary progression of Okladnikov's model, which, it will be recalled, was developed during in the 1930s, was explicitly the product of state sanctioned historical-materialist principles of cultural evolution:

> This material clearly and definitely indicates that the principles of the outstanding essay by F. Engels 'The Origin of the Family, Private Property and the State', where he developed a model of universal shift from a matriarchal clan to a patriarchal clan, are fully and entirely supported by new evidence regardless of its cultural or geographic origin, and that various attempts by reactionary scientists to distort the true history of a primitive society, and to 'prove' the eternity of a patriarchate and monogamy are always and invariably altogether defeated. [Okladnikov 1950:271 as cited and translated by Weber and Bazliiskii 1996]

Trigger notes that the Soviet conception of cultural evolution "was accorded canonical status during the Stalin period and scientific criticism of it was not allowed . . . [T]he only leeway allowed reflected the recognition that many cultures were in a transitional rather than a pure state with respect to their stage of development" (1989: 225; see also McGuire 1992:56–59; Miller 1956; Soffer 1983). The parallels with Okladnikov's model are obvious. The inflexibility of Soviet-Marxism likely also contributed to the stagnation of such research in the region since, after Okladnikov, it would have been difficult to produce new insights within such a restrictive theoretical framework.

It may be difficult for many contemporary scholars to appreciate just how oppressive and frightening was the intellectual climate of Stalinist Russia in which Okladnikov practiced his early archaeological research. Perhaps the best illustration is the fact that B.E. Petri, whose work was discussed extensively above and who was Okladnikov's first mentor in the discipline, was executed in 1937 during Stalin's purges in the "Cultural Revolution" ostensibly for his views on evolution, his ties to Kolchak, and his role in establishing the university in Irkutsk (Savel'ev 1991; Savel'ev and Svinin 1994; Weber 1994).

The consequences of this intellectual environment for Okladnikov are clearly visible in hindsight (Weber 1994; Weber and Bazaliiskii 1996). Weber documents a number of examples of "selective, rather than systematic, examination of the archaeological evidence and . . . biased, instead of impartial, interpretation of the data (1994:10)," which permitted Okladnikov to accommodate the Cis-Baikal material within the approved evolutionary scheme. First, in his analysis of the variation in grave goods between male and female burials, Okladnikov failed to report the contents of all graves known to him. In fact, he described none of the 12 Isakovo graves, only 14 of the 37 Serovo graves, and only 19 of the 74 Glazkovo graves (Weber 1994:10). Weber also notes that Okladnikov neglected to report the age or sex of any of the individuals and that, "for each of these cultures he used a different set of characteristics to describe grave contents [making it] extremely difficult, if not impossible, to evaluate his findings regarding burial patterns (Weber 1994:10)." Weber (1994) further suggests that Okladnikov exaggerated the evidence for the elevated status of Isakovo and Serovo women as well as the differences between the spatial organization of Glazkovo cemeteries and the cemeteries of other cultures, both of which were cited as evidence for the change from matriarchal to patriarchal social organization. Finally, Weber (1994) notes that Okladnikov's interpretation of the shift from hunting to fishing modes of production was based primarily on the decreasing size of projectile points and the decreasing proportion of projectile points to fishhooks in graves through time. Leaving aside the various assumptions surrounding how well material culture from graves reflects subsistence economy, Okladnikov's treatment of these data was inconsistent. Depending on the particular analysis, projectile points were variously lumped or split into types, as were culture groups, which resulted in misleading conclusions (Weber 1994:12).

Despite these problems, at the time the model was published in the 1950s there was only minor criticism of its social and evolutionary aspects. Instead, the little criticism the model did receive was directed at its chronology.

2.2.3 *Culture-History Debates: 1955–the introduction of ^{14}C dating during the 1980s*

Although the overt political pressure was all but gone by the time Okladnikov's synthesis was published, there still appears to have been a general unwillingness by subsequent archaeologists to challenge Okladnikov's account of social evolution. Weber (1994) notes that, after Okladnikov, only Khlobystin (1972) and Khlobystina (1990) directly addressed the model's social characteristics, but that neither departed from Okladnikov's general approach to the study of mortuary materials. Overall, this lack of concern with the social dynamics of mortuary practices is the result of a number of specific factors.

First, in part, Okladnikov's authority is clearly a product of the sheer volume of work he completed. Michael, writing in 1958, estimated that after World War II ". . . Okladnikov and members of his archaeological expeditions authored approximately ninety per cent of the articles and books dealing with the Neolithic Age in Eastern Siberia (Michael 1958:6)." Outside of Russia, Okladnikov's influence has been even more exaggerated since, until very recently, he was practically the only Russian archaeologist whose work in the region had been translated into English (Okladnikov 1959, 1965, 1971). As a result, English language summaries of the Cis-Baikal material by Western authors are, for the most part, nothing more than abridged versions of Okladnikov's synthesis (e.g., Chard 1958, 1974; Griffin 1960; Michael 1958, 1992a, 1992b; Tolstoi 1958). Weber points out that the general acceptance of Okladnikov's work by both Russian and Western scholars is likely also due to the fact that subsequent works:

> . . . were typically based on fewer lines of investigation (e.g., anthropometric features, pottery styles, etc.). None of their studies approached the scale of Okladnikov's comprehensive synthesis of a wide range of archaeological and ethnographic evidence. Thus, all these alternative views had the appearance of being less thoroughly substantiated, if not sometimes entirely speculative. [Weber 1994:12]

Second, Weber also suggests that:

> . . . various archaeologists, many of them being Okladnikov's own students, probably for their own personal reasons deliberately chose not to revisit the issue. A disagreement with the social aspects of the model might have meant a political statement of quite a different nature. On the other hand, a reanalysis of some aspects of the model using the same approach was bound to produce superfluous results. (e.g., Khlobystina 1990). [Weber 1995:12

A third important factor was the general change in priorities of Russian archaeology away from the early Soviet concerns of ethnogenesis and cultural development and towards questions of culture-history (Trigger 1989).

Finally, the increasing pace of fieldwork since Okladnikov's publication has produced such a mass of data that it may have delayed theoretical reflection and led to minimal progress by overwhelming the ability of the archaeological community to process it (Savel'ev 1989:1). After the interruption of World War II, archaeological fieldwork in the Cis-Baikal reached its peak and numerous expeditions were conducted during the late 1940s and 1950s. Okladnikov (1953, 1956, 1958), himself, continued to survey the Angara valley throughout this period. In 1956 another large expedition searched for sites along the Angara between Irkutsk and Bratsk, as well as in the Little Sea region, which was relatively unexplored compared to the Angara valley. The most extensive work on the Baikal coast at this time was conducted by Khoroshikh from the source of the Angara to Ol'khon Island in 1947 (Khoroshikh 1948, 1949, 1950, 1952, 1955, 1955a, 1955b), by Griaznov and his team in 1959 (Griaznov and Komarova 1992), and by various researchers at the site of Sagan-Nuge beginning in the late 1950s (Kazantsev and Khoroshikh 1962; Khoroshikh 1957, 1958, 1959, 1960, 1962, 1962a, 1963; Svinin 1956a, 1956b, 1958, 1966, 1971a; Svinin and Zaitsev 1982; Svinin et al. 1986). Griaznov's team also reexcavated Ulan-Khada; unfortunately, a full site monograph of this important site has still never been published, an occurrence that is all too common in the region. In fact, Vasil'evskii (1978:5) notes that, with the single exception of Fofanovo, none of the mortuary sites excavated during the 1950s have been published as site monographs, a situation that he also believes contributed to the "theoretical vacuum" in Cis-Baikal archaeology. In the 1970s, Okladnikov (1974, 1975, 1976) did eventually publish descriptive summaries of many of the mortuary sites excavated before and after World War II, but little of this material has been analyzed in any systematic way.

Together, these four factors resulted in a shift in the character of archaeological research in the Cis-Baikal away from questions of social organization and culture change to an almost exclusive concern with refining culture-historical sequences. Indeed, the absence of discussion surrounding the social dynamics of Cis-Baikal mortuary practices is even more striking when contrasted with the vigorous debate surrounding the region's culture-history that, until quite recently, dominated the archaeological discourse (e.g., Aseyev 2002; Georgievskaia 1979, 1989; Goriunova 1996, 1997, 2002; Goriunova and Klobystin 1992; Goriunova and Smotrova 1981; Kharinskii and Sosnovskaya 2000; Khlobystin 1964a, 1964b, 1965, 1969, 1978, 1992; Konopatskii 1982; Mamonova and Sulerzhitskii 1986, 1989; Savel'ev and Medvedev 1973; Sinitsyna 1986; Svinin 1974; Turkin and Kharinsky 2004; Vasil'evskii 1978; Weber 1995; Weber et al. 2002; Zubkov 1982). In particular, this debate revolved around determining the place of the Kitoi culture within the chronological framework.

Shortly after Okladnikov published his model, another of Petri's students, the renowned physical anthropologist Gerasimov (1955), argued on the basis of cranial morphology and archaeological materials that the Kitoi were the oldest of the region's Neolithic groups and not, as Okladnikov had asserted, an intermediate group:

> [The Kitoi Period] ruptures the smooth picture of a unified development of material culture in the Cis-Baikal region. It cuts between the Serovo and Glazkovo Periods as a foreign body that does not contain features of a transitional period between these two stages. The Kitoi Period has no genetic link to either the preceding historical period or the subsequent one. Such an intrusion of foreign culture can be explained only by the influx of a new population to the territory, which is unlikely to have happened.
> [as quoted in Svinin 1992:131, translated by HGM]

In addition to relocating the Kitoi within the chronological scheme, Gerasimov (1955:414–450) also suggested that the Isakovo and Serovo archaeological remains were not sufficiently different to warrant their division into separate cultures, and so he collapsed both groups under the Serovo name. Finally, he also believed that the material culture characterizing the Serovo and Glazkovo cultures exhibited considerable continuity and, as such, they were likely sequential.

Following Gerasimov's initial critique, literally dozens of alternative culture-history models were proposed. Ten years ago, Weber (1995:115) identified three broad classes of opinion regarding the placement of the Kitoi culture: those who generally follow Okladnikov's model and place the Kitoi in the middle of the sequence (e.g., Svinin 1974; Vasil'evskii 1978), those who preserve a unilinear sequence but with the Kitoi at the beginning (e.g., Gerasimov 1955; Konopatskii 1979, 1982), and those who suggest that the Kitoi and Serovo coexisted in the region either due to *in situ* development (e.g., Georgievskaia 1979, 1989; Goriunova 1984; Goriunova and Khlobystin 1992; Khlobystin 1978; Savel'ev and Medvedev 1973; Sinitsyna 1986) or due to immigration from outside of the Cis-Baikal (e.g., Khlobystin 1964b, 1969; Zubkov 1982). Within these broad classes there are numerous regional variants resulting in a bewildering number of typological schemes and terminological systems. Without going into too much detail (cf., Weber 1995), it is safe to say that the lack of agreement between the models demonstrates that none has been particularly successful. Part of the problem appears to be that each of these models prioritizes different aspects of the archaeological record. Gerasimov (1955) and his supporters generally look to osteological data to define relationships (e.g., Gerasimova 1991; Mamonova 1973, 1980, 1983). Other researchers prefer to examine mortuary practices (e.g., Bazaliiskii 2003; Goriunova 2002). Finally, a large number of authors concentrate on ceramic typologies and the comparison with archaeological strata at habitation sites such as Ulan-Khada (Goriunova 1984; Goriunova and Khlobystin 1991). Lithics, while abundant at Cis-Baikal sites, are generally considered to have very limited utility for defining chronological relationships, and so have received comparatively less attention. It was only with the relatively recent introduction of widespread radiocarbon dating to the Cis-Baikal material (Mamonova and Sulerzhitskii 1986, 1989; Weber 1995) that some clarity has been achieved.

2.2.4 *Current Understanding of Cis-Baikal Culture-History and Lifeways*

Although radiocarbon dating was gradually applied to the Cis-Baikal material during the 1970s (Khlobystin 1978, Konopatskii 1982:70–80; Veksler and Putans 1974), it was not until Mamonova and Sulerzhitskii's (1986, 1989) dedicated dating project that the quantity of dates became sufficient to influence interpretations of culture-history. Based on their analysis of 117 dates performed on human bone, Mamonova and Sulerzhitskii were able to conclude that the entire Cis-Baikal cultural sequence is substantially older than defined by Okladnikov, that the duration of the Glazkovo culture is two to three times longer than previously suggested, and that the Kitoi culture is, as Gerasimov first suggested, the oldest of the groups. As with most previous authors, however, Mamonova and Sulerzhitskii continued to advocate a continuous sequence of cultural evolution.

Combining the important work of Mamonova and Sulerzhitskii with a discussion of the abundant archaeological data, Weber (1995; see also Weber et al. 2002) proposed an alternative culture-history model that has replaced all previous accounts. The most significant innovation in this revised model is the identification of a previously unrecognized c.700-year hiatus in radiocarbon dates during the fifth millennium BC that separates the Kitoi from the Serovo (Weber 1995; Weber et al. 2002). As noted above, although previous researchers differed with respect to the placement of the Kitoi culture within the culture-historical sequence, they all basically agreed that the sequence was one of either continuous or parallel cultural development. For Weber (1995), in contrast, the hiatus in radiocarbon dates, combined with previous research demonstrating technological and osteological differences between the Kitoi and Serovo, suggested the presence of a biocultural discontinuity in the region. Recent genetic analyses (Mooder et al. 2003; Mooder et al. 2005, n.d.) further support the existence of such a discontinuity by confirming Gerasimov's (1955) position that the Kitoi were biologically distinct from post-hiatus populations. Weber (1995) also noted that the radiocarbon dates from Serovo and Glazkovo graves exhibit considerably more overlap than discussed by Mamonova and Sulerzhitskii (1986, 1989). While Serovo and Glazkovo graves are commonly distinguished on the basis of a number of typological traits, Weber (1995) and Weber et al. (2002) expressed some reservation about the reliability of these traits. In particular, they noted that grave and burial orientations, which were cited by Okladnikov (1950, 1955) as distinguishing features of Serovo and Glazkovo burials, are more variable than previously discussed, and they agreed with Gerasimov (1955) that the material culture of the two groups shows numerous similarities. Combined with the overlapping radiocarbon dates, Weber et al. proposed that "Serovo and Glazkovo graves represent more complex relations than just two successive hunter-gatherer adaptations, or separate cultures (2002: 289)." To better reflect this complex relationship, these authors combined the two groups of graves into the single analytical unit, Serovo-Glazkovo, although "with the stipulation that the Serovo-Glazkovo distinction requires comprehensive examination from this new perspective (Weber et al. 2002:289)." In Chapter 3, this topic is addressed further through the application of a new approach to investigating the region's radiocarbon data.

Weber's (1995) chronology set the stage for a major shift in the focus of Cis-Baikal archaeology away from questions of culture-history and towards the general problems of defining the cultural parameters of the populations on either side of the biocultural discontinuity and, ultimately, discovering the factors contributing to the observed hiatus. It was towards this end that the multidisciplinary BAP was developed, including the research described in this dissertation (Weber and McKenzie 2003).

To date, research by BAP has focused primarily on the application of radiocarbon dating, skeletal biology, bone chemistry, and DNA analysis to both new and existing collections of human remains (e.g., Ezzo et al. 2003; Katzenberg and Weber 1999; Lam 1993; Link 1996, 1999; Mooder et al. 2003; Mooder et al. 2005, n.d.; Schurr 2003; Weber and Katzenberg 1998; Weber et al. 2003). This research, described in more detail below, suggests a number of differences between the pre- and post-hiatus cultures in such critical areas as food procurement, diet, mobility, health, genetic affiliation, and demographic trends. The following is a summary of the general model of Middle Holocene adaptations as described in Weber (1995) and Weber et al. (2002).

Early Neolithic (c. 5800–4900 BC)

During the Early Neolithic, the Kitoi culture, which is presumed to have developed *in situ* during the previous Late Mesolithic (Gerasimova 1991; Haeussler 1993ab; Mamonova 1983; Weber et al. 2002), began to use large formal cemeteries for the first time including the sites of Lokomotiv, Kitoi, and Ust'-Belaia in the Angara valley, and Shamanka II on the southern Baikal coast. A number of other smaller cemeteries have also been identified including Makrushina and Turuka in the Upper Lena valley, and Khuzhir, Ulan-Khada, and Khotoruk in the Little Sea microregion.

Based on the number of sites and burials in the Cis-Baikal, Weber et al. (2002)

suggest that the Kitoi population was approximately one-quarter of the size of the subsequent post-hiatus population. In addition, they observe that the distribution of Kitoi groups over the region was very uneven, with the majority living in the Angara valley in comparison to post-hiatus groups that were distributed more evenly. Okladnikov (1959) noted that Kitoi cemeteries tend to be found near sources of green nephrite, and he speculated that these groups might have been involved in specialized trading of this relatively rare material. Weber (2003, 2004a, 2004b) also points out that large Kitoi cemeteries, some of which contained over 100 burials (e.g., Lokomotiv and Shamanka), tend to be found at river confluences or on shallow coves where high fish abundance and diversity would have been favourable to support large groups of people. Certainly fish was an important part of the Kitoi diet, as evidenced by the greater abundance of fishing paraphernalia in graves and at habitation sites compared to later populations. Stable isotope values obtained from human skeletal material further support the suggestion that the Kitoi relied on aquatic resources more than did later Serovo or Glazkovo populations (Katzenberg 2004; Katzenberg and Weber 1999), although terrestrial resources including various ungulates (e.g, roe deer, red deer, elk) were also important.

Stable isotope data have also been used to differentiate Kitoi mobility patterns from later groups. More specifically, there is greater inter- and intraregional variation in isotopic ratios among Kitoi groups than later populations. This suggests that Kitoi groups were more reliant on foods available in their immediate residential area than later groups. It also suggests that that there was little or no migration of individuals between Kitoi communities since both the inter-community flow of individuals and large-scale community movement would eliminate any noticeable differences in isotope ratios.

Overall, Weber et al. (2002) conclude that the Kitoi dependence on aquatic resources would have contributed to the formation of relatively large local groups who occupied particularly resource-rich locations for extended periods of time. Thus, the Kitoi were likely concentrated within fewer but larger groups than the Serovo-Glazkovo, resulting in higher local population densities, smaller annual ranges, lower group residential mobility, and less interaction between neighbouring communities.

Many of the basic typological characteristics defining the Kitoi mortuary protocol remain unchanged from Okladnikov's (1950, 1955) original descriptions, although greater variability is now recognized, particularly on the shores of Lake Baikal where the material was unknown to Okladnikov, and some aspects of his descriptions have since proved to be false. The following description, then, cites those aspects of Okladnikov's work that are still considered valid, as well as introduces criteria based on more recent research.

In general, Kitoi individuals were interred in elongated pits of variable depth. At some sites, such as Kitoi, most graves include only a single individual; however, some sites contain a large number of multiple graves containing up to six (Lokomotiv) or seven (Fofanovo) individuals. Graves show a wide diversity in orientation, which Okladnikov (1950) attributed to seasonal changes in the location of the sun on the horizon. Along the Angara and Upper Lena rivers the graves lack stone architecture, but on the shores of Lake Baikal Kitoi graves tend to be filled with a combination of sediment and paving stones presumably obtained from the local bedrock outcrops. The body position is typically extended supine, and head-to-toe position is common for the double and communal interments. By far the most characteristic feature of Kitoi burials is the liberal use of red ochre to cover the individuals; however, very recent work suggests that this treatment was probably not as common in the Little Sea area (Weber and Goriunova 2005). Other important features of Kitoi mortuary practices include burials without heads and the presence of "stray bones" from other individuals in graves (Bazaliiskii 2003), although as the analysis of the Early Bronze Age Khuzhir-Nuge XIV cemetery reveals in Chapter 4, neither of these last two features are exclusive to Kitoi graves.

Grave inclusions share characteristics with both the Mesolithic (prismatic blades, wedge-shaped cores, end scrapers, burins) and the Neolithic (pottery, arrowheads, ground stone adzes, and fishing paraphernalia). Of particular typological importance is the "Kitoi composite fish-hook" and the variety of anthropomorphic and zoomorphic figurines (Bazaliiskii 2003). Ceramics are very rare in Kitoi graves. For example, Okladnikov (1950:111) only identified a single mitre-shaped pot with net impressions. Likewise, of the 87 graves at the largest Kitoi site, Lokomotiv, only three included ceramics (Bazaliiskii 2003:41).

As noted above, Okladnikov suggested that males were interred with both a greater number and range of artifacts than were females, implying both the existence of social inequalities and the establishment of patriarchal social relations. In this context, multiple graves were interpreted as evidence of slaves or concubines buried with masters (Okladnikov 1950). The presence of children in male graves rather than female graves was cited as further evidence of the transformation of matriarchal to patriarchal social relations (Okladnikov 1950:409). Given the problems with both Okladnikov's chronology and his methods of analysis and interpretation discussed above, as well as recent methodological and theoretical developments in mortuary archaeology in general, it is clear that a reevaluation of the degree and nature of Kitoi mortuary variability and its relationship to social organization is required. More recently, the relatively prevalent grave disturbances and evidence for violence in Kitoi communal graves have also been interpreted as evidence for internal social frictions relating to existing power structures and land rights (Bazaliiskii 2003; Bazaliiskiy and Savel'ev 2003; Mooder et al. 2005); however, this also requires systematic examination in a broader context.

Middle Neolithic Hiatus (c. 4900–4200 BC).

In the 10 years since Weber (1995) first identified the biocultural hiatus, ~350 new radiocarbon dates have been acquired from the region's mortuary sites, and none fall within the gap. Although osteological research demonstrates that Kitoi individuals had slightly higher levels of non-specific skeletal stress markers than later groups (Lieverse 2005; Link 1996, 1999), "virtually all health indicators . . . reveal high levels of community health, and thus successful exploitation of the region's abundant resources, by both pre and post-hiatus populations (Lieverse 2005:186)." As such, there is little reason to believe that the Kitoi population was depleted due to illness or other physiological stresses. Likewise, climate change during this period was apparently not of a magnitude that would have required abandonment of the region (White n.d.). It seems unlikely, therefore, that the lack of cemeteries represents a lack of people. Instead, Weber et al. (2005) now consider it possible that around the beginning of the 5th millennium BC, Kitoi groups returned to a more mobile foraging lifestyle typical of most boreal hunter-gatherers known both ethnographically and archaeologically (e.g., Binford 2001; Kelly

1995):

> Thus, rather than a hiatus in occupation, the Middle Neolithic period should more properly be conceived of as a break in the use of formal cemeteries. Since the use of formal cemeteries by hunter-gatherers is almost invariably a result of growth in social complexity linked to relative sedentism and the intensification of subsistence activities, including increased reliance on fishing, it is reasonable to suggest that the lack of cemeteries during the Middle Neolithic represents some sort of reversal of such trends. [Weber et al. 2005]

So far, it has been difficult to identify and describe the Middle Neolithic because of the lack of appropriate temporal resolution at living sites compared to mortuary sites. In an attempt to rectify this situation, BAP will soon conduct new excavations and extensive radiocarbon dating at stratified habitation sites. It is hoped that this evidence, along with continued refinement of environmental changes and pre- and posthiatus cultural dynamics, will allow us to establish the cultural processes involved in this unique pattern of culture change.

Late Neolithic and Bronze Age (c. 4200–1000 BC)

By approximately 4000 BC, formal cemeteries reappear in the Cis-Baikal and are associated with the Late Neolithic Serovo and Early Bronze Age Glazkovo cultures. Among the more well known sites are Ust'-Ida in the Angara valley, Verkholensk and Makrushina in the Upper Lena valley, and Sarminskii Mys, Khuzhir, KN XIV, Kurma XI, Uliarba and Ulan-Khada in the Little Sea region.

While both DNA (Mooder et al. 2003; Mooder et al. 2005, n.d.) and osteological (Gerasimov 1955; Gerasimova 1991; Mamonova 1973, 1980, 1983) analyses suggest that the Serovo-Glazkovo were genetically distinct from the preceding Kitoi culture and thus were likely immigrants to the Cis-Baikal, the geographic origins of this post-hiatus population are currently unknown. Gerasimova (1991) suggests that gene flow from the west is responsible for the Serovo-Glazkovo osteological diversity. Ceramic styles also show some similarities with traditions in the upper Yenisei Basin (Weber 1995) and the Krotovo and Okunevo Culture in West Siberia (Goriunova 1997). Some of the diversity of Glazkovo traditions, including sitting burials, is more similar to that of the Late Neolithic Slab Graves Culture from southern areas including the Trans-Baikal, northern Mongolia and central Kazakhstan (Okladnikov 1955; Volkov 1975). White (n.d.) is currently investigating the possibility that climatic changes and/or pressures from nomadic pastoralist groups expanding their territories along the southern peripheries of the Cis-Baikal may have stimulated migrations of small hunter-gatherer populations along the forest-steppe ecotone during the Middle Holocene. Such patterns would, in principle, be similar to the population movements known to have occurred in this part of the world during later times (e.g., Scythians, Huns, Mongols).

As mentioned above, Weber et al. (2002) note that there is both a greater number of post-hiatus mortuary sites and a greater diversity in regional location compared with the Early Neolithic Kitoi, suggesting a larger and more evenly distributed regional population that would have had greater intercommunity interaction.

Stable isotope signatures among Serovo-Glazkovo groups were remarkably consistent across the entire region, suggesting that these groups traveled more extensively and/or that they used a broader range of resources for their diet than did the earlier Kitoi groups. In addition to bone chemistry studies, faunal evidence has also been used to examine subsistence patterns. An analysis of Gorelyi Les—a habitation site in the Angara Basin containing both Kitoi and Serovo-Glazkovo layers—shows that the Kitoi materials are rich in ungulate remains, lithics, and hearths (Weber 1997). In the Serovo-Glazkovo levels, however, the quantity and density of these remains are much smaller, which Weber et al. (2002) argue reflects differential site use. More specifically, it appears that the less mobile Kitoi used the site more intensively, perhaps as a home base, while the Serovo-Glazkovo with their greater mobility used the site less frequently and/or for a shorter duration while on logistical movements. An analysis of the faunal remains from a number of habitation sites is needed in order to clarify this issue, and comprehensive zooarchaeological analyses are currently beginning in the region for the first time (Weber 2005).

In addition to terrestrial mammals, seals have also been discovered at both pre- and post-hiatus habitation sites. Although the use of seal was probably always limited to a short spring season and so made up only a minor portion of the diet, seal bones are found in increasing numbers in Serovo-Glazkovo habitation sites compared to Kitoi camp sites where they are relatively rare (Weber et al. 1993, 1998). This is true even for habitation sites located near to places where seal hunting would be expected to have occurred (based on Serovo-Glazkovo camps that contain numerous seal bones). It is also noted that the use of seal during post-hiatus times was both more variable (e.g., used in mortuary contexts) and more structured, as evidenced by the methods of selection and transportation, suggesting that Kitoi and Serovo-Glazkovo may have had different perceptions of resources (Weber et al. 2002).

As with Kitoi, many of the basic typological characteristics defining Serovo and Glazkovo mortuary protocols remains essentially unchanged from Okladnikov's (1950,

1955) original descriptions, although with modifications based on more recent research. In general, Serovo mortuary sites are rather small and rarely contain more than 10 burials, while a few Glazkovo cemeteries contain over 80 individuals (e.g., KN XIV). Graves in both groups are typically single interments in relatively shallow (<0.5 m deep) pits filled with stone slabs. Double and communal graves do occur, but unlike Kitoi multiple graves, individuals are never oriented head-to-toe. In Serovo graves in the Little Sea microregion, multiple individuals are commonly layered (i.e., one individual on top of another). Extended supine is the most common body position in both groups, although flexed and "sitting" burials begin to appear in Glazkovo times (Okladnikov 1955:307–308). Within cemeteries, grave orientation is more consistent than it was for Kitoi, but between cemeteries there is some variation. Although Okladnikov (1955:235–236) suggested that Glazkovo cemeteries exhibit rows of graves, while Serovo cemeteries do not have any spatial patterns, more recent research indicates that both Serovo and Glazkovo cemeteries show similar intrasite spatial patterning (e.g., Ust-Ida, Verkholensk). Since the nature and meaning of spatial patterns within individual cemeteries has rarely been systematically examined, this topic is addressed further in the analysis of KN XIV in Chapter 4.

The use of ochre in Serovo and Glazkovo graves tends to be limited to small patches, likely reflecting its use on clothing; however, recent work suggests that at least some Glazkovo graves in the Little Sea microregion exhibited extensive ochre use to cover the body (Weber and Goriunova 2005). Evidence for the use of fire is very common in Serovo graves, but it also occurs at some Glazkovo sites including very frequent presence at KN XIV (Chapter 4). In Serovo graves, hunting gear occurs frequently and especially important is the introduction of the composite bow, as evidenced by antler bow plates. Other common goods include spears, ground nephrite axes, and new forms of tanged arrowheads. Unlike Kitoi graves, Serovo graves frequently contained pottery (Khlobystin 1969; Okladnikov 1950, 1955, 1959; Weber 1994, 1995), although ceramics are less common at Glazkovo mortuary sites. The major feature distinguishing Glazkovo graves is the inclusion of copper and bronze artifacts including fishhooks, rings, needles, and knives, and the introduction of white nephrite. Although Okladnikov (1955) documented that Glazkovo graves contain the highest proportion of fishing gear, this conclusion requires reevaluation.

As noted above, Okladnikov observed little variability in grave goods between Serovo individuals, which he interpreted as evidence of social equality (Okladnikov 1950, 1955). In contrast, he noted extensive inequality during the Glazkovo period, which, it will be recalled, was for Okladnikov the culmination of the entrenchment of patriarchal social relations. While multiple graves at Serovo cemeteries are cited as further evidence of uniformity and equality between members of a society, at Glazkovo and Kitoi cemeteries multiple graves were cited as evidence of inequality. Again, given the problems with both Okladnikov's research discussed above, it is clear that mortuary variability in Cis-Baikal requires comprehensive reevaluation. This is particularly the case for the presumed differences between Serovo and Glazkovo mortuary practices since, as discussed above, recent research suggests a much stronger degree of chronological, biological, and cultural continuity between these groups than recognized by Okladnikov. In Chapter 3, radiocarbon dates of Serovo and Glazkovo burials are compared in an attempt to clarify the chronological relationships between these traditions.

Overall, then, recent research by BAP provides a number of fairly detailed insights into the chronology, health, diet, genetic affiliations, and mobility patterns of Cis-Baikal groups during the Middle Holocene, but it also reveals some very important gaps in our current knowledge. While, to date, this work has been constructed primarily on the basis of various archaeometric and osteological analyses of human remains, it was recognized from the very beginning of the BAP collaboration that systematic reevaluation of mortuary practices would also be required in order to place these variables within their social context:

> Since we hypothesize that subsistence and social relations differed considerably between Kitoi and Serovo-Glazkovo, it is reasonable to expect that they were wrapped in a context of contrasting world-views. This topic has not been explored so far and requires dedicated research in which examination of mortuary data will play a critical role. [Weber et al. 2002: 291]

As noted throughout this chapter, the little research that does exist regarding social dynamics of mortuary variability was conducted by Okladnikov more than 50 years ago within the context of a flawed chronology and a rigid Soviet-Marxist evolutionary framework that encouraged the biased treatment of archaeological data. Since that time, mortuary sites have generally not been examined as meaningful places constructed through dynamic social processes, but rather as sources of typological data for refining culture-historical models. As such, there has been a conspicuous lack of concern with patterns of variability at the level of individual cemeteries. Consequently, despite the fact that the bulk of our information about this intriguing period has been obtained from mortuary sites, we have a poor understanding of the dynamics contributing to intra- and intersite variation in mortuary practices, or how these mortuary practices are related to broader social, political, and economic aspects of life.

To this end, BAP initiated a series of original excavations to acquire high-resolution temporal and spatial intrasite data. The project also constructed a database of Cis-Baikal mortuary practices to organize the abundant data available from both past excavations and the literature. In the following sections I discuss both of these datasets in more detail and describe the overall theoretical and methodological approach that I employ to guide the analysis of this material.

2.3 APPROACH

As mentioned in Chapter 1, the research constituting the body of this dissertation is presented in the form of four separate studies (Chapters 3–6), each of which has its own approach, methods, and materials. Nevertheless, it is important at this point to describe briefly the general theoretical and methodological approach that frames all of the research and thus unites the four studies into a cohesive project.

The theorization of mortuary practices by Anglo-American archaeologists has a rich history that has been well documented in a series of volumes beginning in the early 1970s (Beck 1995; Brown 1971; Chapman et al. 1981; Chesson 2001; O'Shea 1984; Silverman and Small 2002, Rakita et al. 2005). Rather than recapitulating this history here, I instead concentrate primarily on the approach to mortuary analysis used in this dissertation.

A range of studies conducted under the processual program has demonstrated that mortuary practices are related in generally regular and predictable ways to various aspects of social organization (e.g., Binford 1971; Carr 1995; Goldstein 1981; O'Shea 1984; Saxe 1970). The basis for this approach lies in the assumption that the social identities an individual maintains in life are reproduced in the treatment that individual receives after death. As such, the structure of mortuary practices should, more or less, reflect the social structure of the society.

While this approach has contributed a great deal to our understanding of prehistoric societies, the approach itself is not without limitations. Beginning in the early 1980s archaeologists began to draw on ethnographic (Bloch and Parry 1982; Hertz 1960, Metcalf and Huntington 1991; Van Gennep 1960) and ethnoarchaeological (e.g., Dillehay 1990; Hodder 1982a; Parker Pearson 1982) studies to present a number of "cautionary tales" (see especially Ucko 1969) in which mortuary ritual did not seem to express a direct relationship with social structure, but instead varied according to religious belief and individual agency (e.g., Cannon 1989; Hodder 1982a; Parker Pearson 1982). Much of this research, generally classified under the banner of postprocessual archaeology, emphasized that mortuary ritual is a social practice that varies with both the relations among the dead and among the living. As such, mortuary rituals can provide a medium through which the living can establish, legitimize and renegotiate social, political, and economic relations, rather than simply a context to reflect such relations (Parker Pearson 1982). It is argued that in order to fully understand mortuary practices it is necessary to consider the historical context in which these practices are enacted (e.g., Cannon 1989; Hodder 1982ab).

More recently, there appears now to be consensus that processual and post-processual perspectives are not mutually exclusive, and that mortuary practices are best investigated from more holistic approaches that acknowledge both the multiscalar and multidimensional nature of mortuary variability (e.g., Brown 1995; Cannon 2002; Charles and Buikstra 2002). One such integrative approach takes as its focus the spatial representation of death (Goldstein 1980, 1981, 1995; papers in Beck 1995 and Silverman and Small 2002).

Twenty-five years ago, Goldstein (1980, 1981) outlined an approach based on the assumptions that mortuary variability is multidimensional, and that the best way to examine the relationships between these dimensions "is to use the spatial component of the mortuary system as the organizational framework (Goldstein 1981:57)." She further noted that the spatial dimension is, itself, multidimensional or, in Cannon's (1996) terms, *multiscalar*.

> For example, space utilization can refer to placement of grave associations in relation to an individual, placement of the individual in relation to others, placement of groups of individuals, and placement of the disposal area itself . . . The different dimensions may represent different cultural elements, and thus should be carefully sorted out and analysed. [Goldstein 1981:57]

Goldstein's work was influential, although less for her position on the importance of multiscalar spatial analysis and more for her test of Saxe's (1970:119) Hypothesis 8, which links the maintenance of formal disposal areas with the degree to which corporate groups legitimize rights over restricted resources through lineal ties to ancestors (Goldstein 1976, 1981; see also Carr 1995; Charles and Buikstra 1983; Morris 1991). In fact, it was not for another fifteen years, with the publication of an edited volume entitled, *Regional Approaches to Mortuary Analysis* (Beck 1995), that the regional scale would again be emphasized as an essential component of mortuary studies. The multiscalar and multidimensional nature of such analysis would also be reemphasized in this volume.

> . . . the term *region* is used as a shorthand for a hierarchy of social and spatial scales over which cultural behavior is meaningfully organized (in the past) and understood (in the present). As such it establishes a framework within which synchronic and diachronic approaches can be combined. [O'Shea 1995:126]

In recent years, anthropology has explored the importance of landscapes as mnemonics for history and memory (e.g., Feld and Basso 1996; Hirsch and O'Hanlon 1995; Ingold 2000; Low and Lawrence-Zuniga 2003; Silverman and Small 2002). This concern is also reflected in recent archaeological investigations of monuments, including cemeteries (e.g., Barrett 1994; Bradley 1998, Silverman and Small 2002; Tilley 1994, 2004). Cannon (2002), in particular, argues that the spatial representation of death offers a context within which to link individual beliefs and actions with larger patterns of social organization and ideology.

> Focus on the spatial representation of death demands recognition of the perceptions and ritual actions of the living, and draws attention to the ongoing role and underlying meaning of the dead. It also provides a link between individual decision making and the long-term history that might only be perceived and interpreted from an archaeological perspective . . . [Cannon 2002: 191]

Like Goldstein (1981) and O'Shea (1995), Cannon sees the spatial dimension as "a natural focus for mortuary archaeology, which has lacked a unified theoretical position since the processualist focus on energy expenditure (2002:192)."

In this dissertation, I employ the spatial dimension as a framework to describe and explain multidimensional variation in Cis-Baikal Middle Holocene mortuary practices, and I do so at three scales of analysis: micro, meso, and macro. Microscale analysis is appropriate for phenomena that persist over relatively short periods and limited areas and so provides information on local practices. In the context of the research described here, the microscale analysis consists of a detailed investigation of the newly excavated Neolithic–Bronze Age cemetery KN XIV. Few studies over the last 50 years have examined Cis-Baikal cemeteries as meaningful places in their own right. Consequently, we have little information on the social dynamics contributing to intrasite variability, or how this variability may be spatially encoded.

The conclusions derived from KN XIV are then contexualized through a comparison with similar analyses at 19 Bronze Age cemeteries from the surrounding Little Sea area (mesoscale). This area has the advantage over many other Cis-Baikal microregions in that it has been relatively well surveyed (Goriunova 1997, 2002; Goriunova and Khlobystin 1992; Goriunova and Svinin 1995, 1996, 2000; Griaznov and Maksimenkov 1992; Kharinskii and Sosnovskaia 2000; Khoroshikh 1948, 1949, 1950, 1952, 1955a, 1955b, 1955c; Komarova and Sher 1991). Furthermore, this area was comparatively unaffected by the construction of hydroelectric dams on the Angara river during the last 50 years. By investigating the Little Sea microregion as a whole, we are able to draw meaningful interpretations surrounding the activities of localized populations within a specific and spatially well-defined territorial context. Unfortunately, owing to the nature of the publication record, the analyses of these comparative sites are necessarily less detailed than was the case for KN XIV. Nevertheless, the available data do provide a reasonable foundation upon which to begin the process of documenting regional variability.

Finally, macroscale analysis deals with long-term phenomena over broad regions (i.e., the entire Cis-Baikal). Unfortunately, comprehensive analysis of mortuary variability at this level is well beyond the scope of this dissertation. As a result, in this study macroscale analysis will be considered only during the evaluation of radiocarbon dates in

Chapter 3; however, future research is planned to compare the mortuary variability between the Little Sea, Angara and Upper Lena microregions.

Before such multiscalar spatial analyses can be conducted, however, it is necessary to establish a relatively firm and reliable temporal framework in order to distinguish short and long-term processes (Chapman 2005). To this end, I examine both new and existing radiocarbon dates to describe chronological relationships at both local and regional scales of analysis. The microscale temporal framework is based on the analysis of an original set of 87 radiocarbon dates from the site of KN XIV. This analysis not only permits an unprecedented examination of intrasite temporal patterns of cemetery use, but it also reveals a number of limitations with the region's radiocarbon dataset. These limitations have greatly contributed to the diversity in opinion surrounding the extent to which radiocarbon dates are useful for evaluating the region's many competing culture-history models. To help overcome this problem, a new methodology is introduced that is based on the analysis of collagen yields in bone samples used to obtain radiocarbon dates. The conclusions derived from the analysis of the KN XIV radiocarbon dataset are then extended to clarify chronological relationships across the Little Sea microregion and the entire Cis-Baikal.

Given the previous lack of concern with such spatial and temporal aspects of mortuary practices in Cis-Baikal, much of this dissertation will be exploratory in that it will endeavor to identify patterns and propose interpretations rather than test formal hypotheses (Gibbon 1984). Having said that, a number of research statements are generated throughout this dissertation that will be appropriate topics for future research.

2.3.1 Materials

Over 10 years ago, Weber and Bazaliiskii (1995) began constructing an extensive database of Cis-Baikal mortuary practices as a means to organize the massive quantity of data available from both the extensive literature and new excavations. This database subsequently became the core around which BAP was designed, and its refinement continues to be one of the Project's most significant and ongoing tasks (Weber 2001, 2005). The database describes variability in mortuary practices at four nested scales of analysis: the mortuary site, the feature, the burial, and grave inclusions. In general, the Site Level of analysis contains data on the regional and topographic location of the site, the number of graves and their relative chronological position. The Feature Level describes variation relating to the grave as a receptacle for the deceased individual, and it includes descriptions of grave type (e.g., number of individuals, number of burial layers), topographic location relative to rivers, lakes and terraces, and grave architecture (e.g., length, width, depth, orientation, construction materials). The Burial Level describes the remains of the individuals interred within the grave, including their age, sex, skeletal inventory, body position, and body treatment. Finally, the Grave Inclusions Level consists of information relating to the artifacts and ecofacts found in association with the features and burials. As mentioned in Chapter 1, an important distinction is thus made between *graves*, by which is meant the physical structure, and *burials*, by which is meant the remains of the interred individual.

The modular approach of the BAP database makes it well suited to the sort of multiscalar analysis conducted in this dissertation. Unfortunately, because of the incomplete publication record of Cis-Baikal archaeological materials, the database does not yet contain comprehensive data on all of the sites known from the region. More specifically, while the Site Level module of the database is reasonably complete, most sites are less well represented in the Feature and Burial Level modules. The Grave Inclusions module is still under construction and so remains largely unavailable. Across the entire Cis-Baikal, the Site Level contains information on 146 Mesolithic—Bronze Age mortuary sites[3]; the Feature Level contains information on 901 graves from 113 sites; and the Burial Level contains information on 1074 burials from 820 graves, from 113 sites. An additional factor contributing to the difficulty in compiling comparable data from each site is that the numerous sources were written by a variety of authors for diverse purposes and over many decades of research. Consequently, although the database strives for a standardized description of mortuary variability, it still cannot be used without some familiarity with the idiosyncrasies of the source literature. Specific details on the particular sites and variables employed in this dissertation are provided in Chapters 3 through 6.

Recognizing the limitations of relying solely on the published literature, BAP initiated the excavation of the Neolithic–Bronze Age cemetery KN XIV to acquire high-resolution temporal and spatial data at all four database levels. KN XIV, originally discovered in 1991, is located on the west coast of the Little Sea microregion. Test excavations of five graves were completed in 1993 by a team from Irkutsk State University, and between 1997 and 2001 BAP excavated an additional 74 graves. Fieldwork methods followed standard protocols and have recently been described in

[3] Maps indicating the location of all sites discussed in this dissertation are provided in the context of the analyses presented in Chapters 3–6.

detail by Weber and Goriunova (n.d.). More specific details on the site are provided in Chapters 3 and 4.

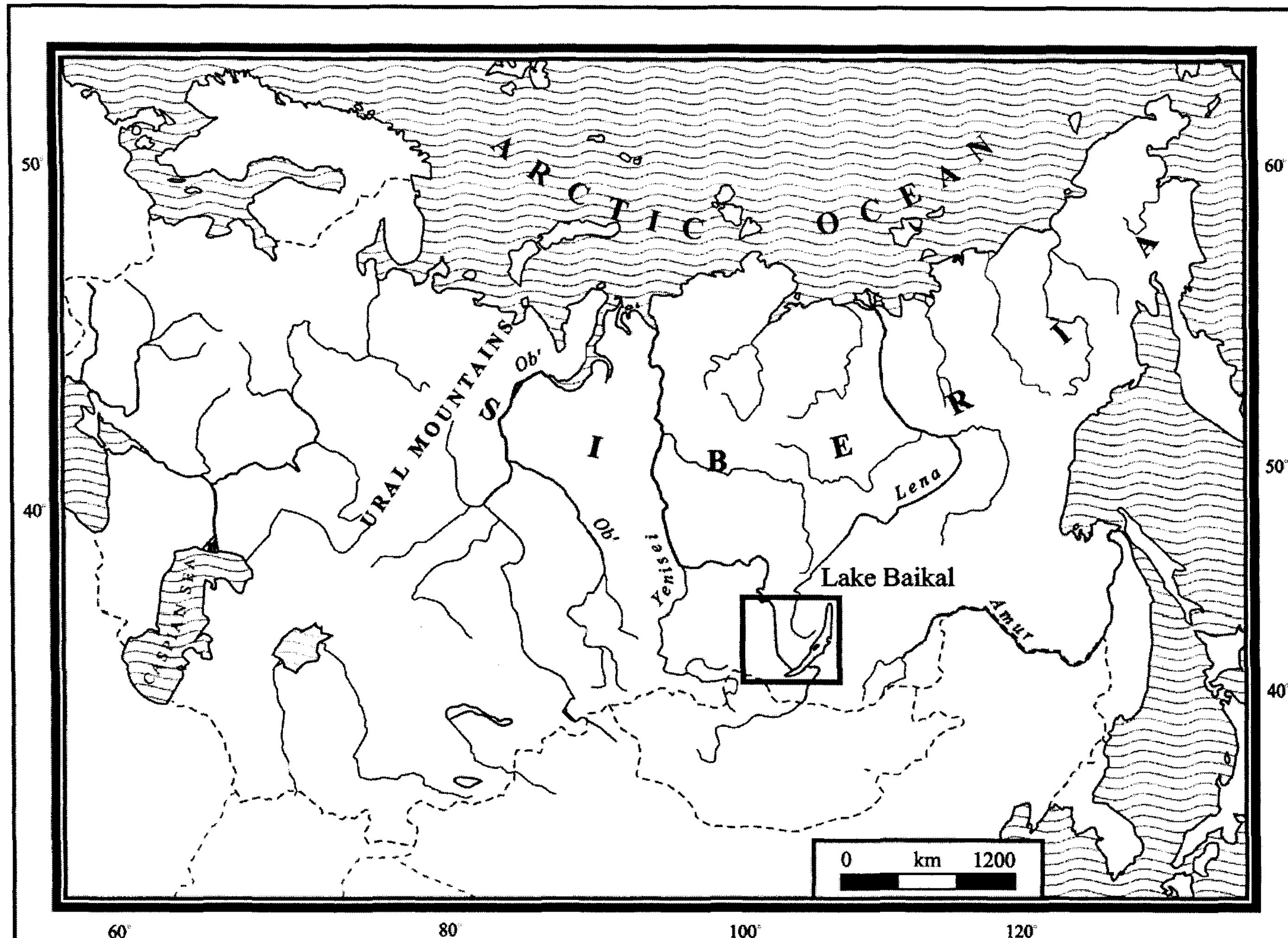

Figure 2.1: Map of Northern Asia indicating the location of Lake Baikal

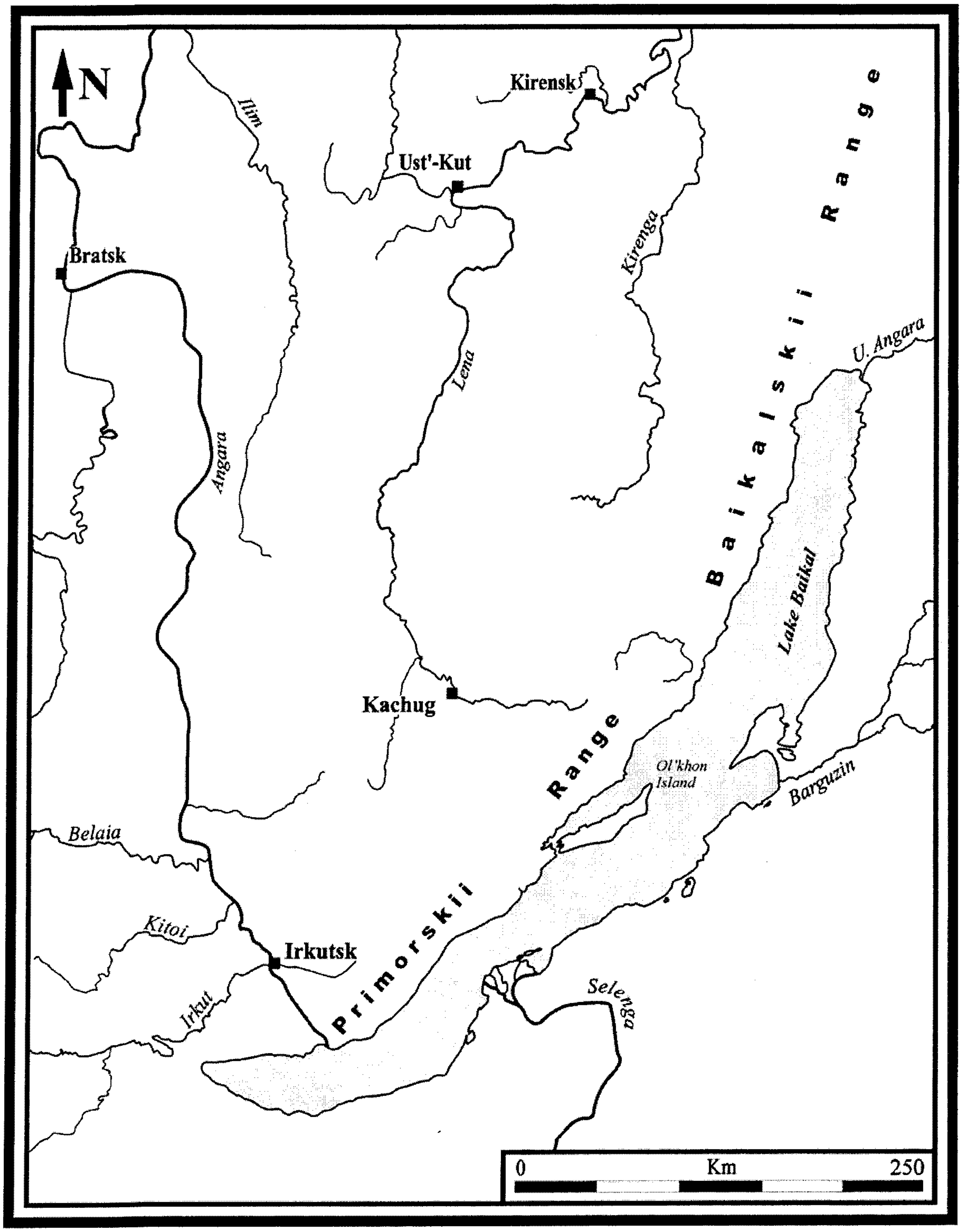

Figure 2.2: Map of Cis-Baikal and its major geographic features

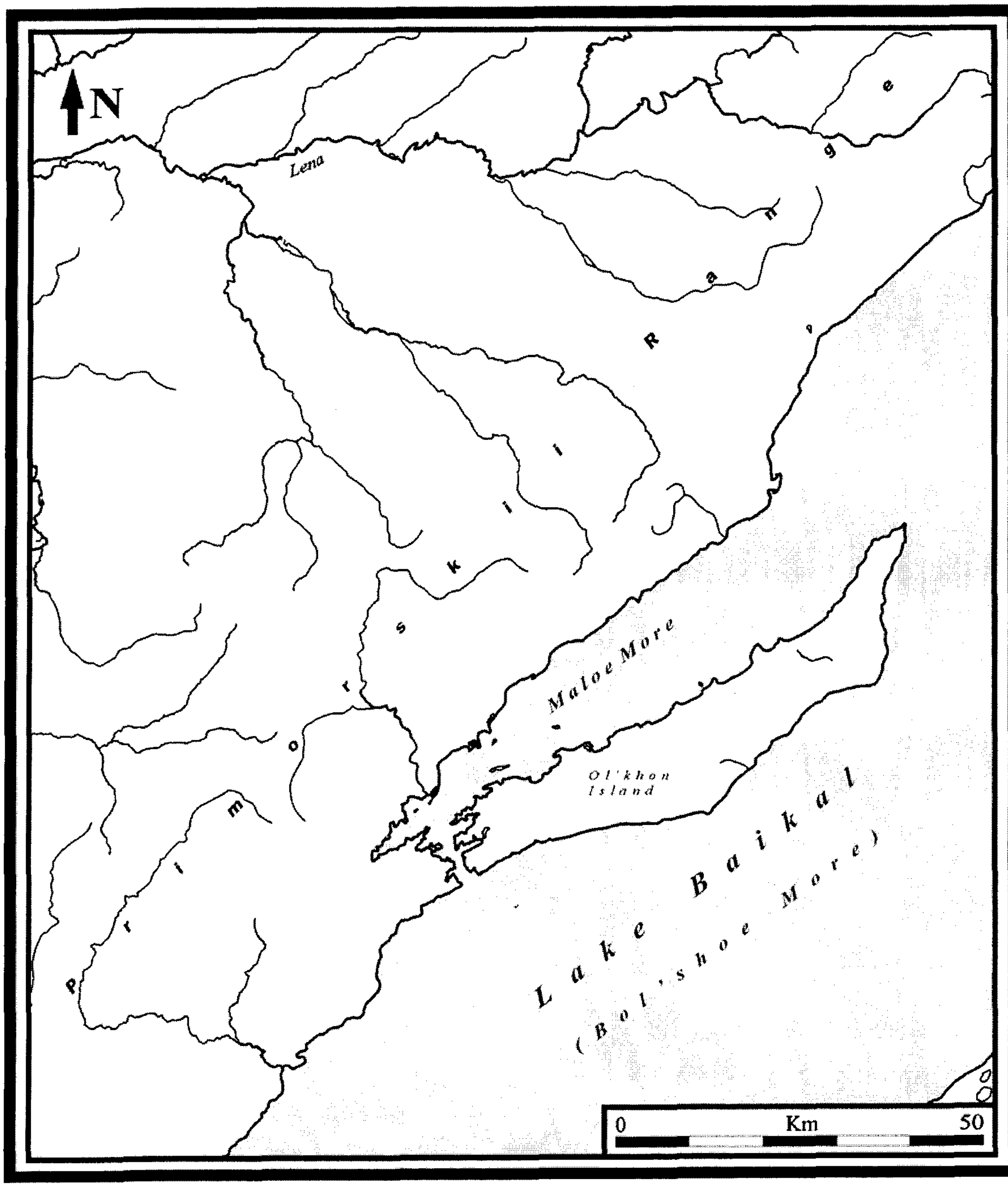

Figure 2.3: Map of the Little Sea (Ol'khon) microregion

Chapter 3
Chronological Patterns of Middle Holocene Cemetery Use in Cis-Baikal[1]

In this chapter, radiocarbon dates from Cis-Baikal Neolithic and Early Bronze Age cemeteries are evaluated to explore chronological patterns of cemetery use at micro-, meso- and macroscales of analysis. As documented in Chapter 2, in the 50 years since Okladnikov (1950, 1955) presented his synthesis of Cis-Baikal archaeological materials, there has been considerable controversy surrounding the chronological relationships between the region's various Middle Holocene cultures. At the same time, there has been a remarkable lack of concern with chronological patterns at the level of individual cemeteries. As a result, we have little information on the duration over which individual cemeteries were used, whether the tempo of individual site use varied through time, the chronological relationships between neighbouring cemeteries, and the chronological relationships between cemeteries across regions. The recent excavation and extensive dating of the Neolithic–Bronze Age cemetery Khuzhir-Nuge XIV (KN XIV), in the Little Sea microregion, presents an excellent opportunity to address these questions, and so to improve our understanding of Middle Holocene mortuary practices.

In addition to documenting temporal patterns of Cis-Baikal cemetery use, this chapter also has the secondary goal of illustrating a number of methodological and interpretive problems that are rarely considered with large sets of radiocarbon dates. In order to address these problems, a methodology is introduced that is based on the joint use of Bayesian statistical methods and the evaluation of collagen yields in the bone samples that are used to derive radiocarbon dates. The discussion of methodological

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[1] Modified portions of this chapter were published in Weber et al. 2005. *Journal of Archaeological Science.* 32: 1481–1500.

considerations will also help to address the controversy surrounding the extent to which radiocarbon dating is useful for refining the Cis-Baikal Neolithic and Bronze Age culture-history. Some scholars in the region rely heavily on radiocarbon dates to define culture-historical schemes (e.g., Kharinskii and Sosnovskaia 2000; Mamonova and Sulerzhitskii 1989; Turkin and Kharinsky 2004; Weber et al. 2002). Weber et al. (2002), for example, suggest that there is "enough justification for the abandonment of typology in the dating endeavor, at least until new correlations have been established (2002:290)," and that, "[e]xtensive radiocarbon dating of human remains will have to assume a leading role in providing the chronological foundations for examination of cultural patterns (2002:290)." In stark contrast, other researchers doubt the ability of radiocarbon dating to clarify such patterns. Goriunova (1997, 2002, Goriunova et al. 2004), in particular, is very critical of the use of ^{14}C dates to define local typologies, and she points to several instances in which chronometric dates appear to contradict information obtained through typological and stratigraphic analyses. I suggest that a major factor contributing to this controversy is the insufficient attention that has been directed to the critical evaluation of Cis-Baikal radiocarbon data. Researchers in the first camp have likely been too quick to accept the results of radiocarbon dating, while those in the second camp have been too quick to dismiss them. The analyses and methodologies introduced in this chapter should go some way to reconciling these positions by providing an additional means of recognizing and accounting for the inherent complexity of radiocarbon results.

Finally, the conclusions derived in this chapter provide the chronological framework within which variation in mortuary practices will be examined at micro- (Chapter 4), and meso- (Chapter 5 and 6) scales of analysis.

3.1 MATERIALS AND METHODS

Six seasons of excavation (1997-2001) at KN XIV (Figures 3.1–3.2) produced archaeological data on 79 graves, including the remains of 89 individuals. In terms of grave and burial orientation, one grave (Grave 7) exhibits characteristics of the Serovo mortuary tradition, while 78 graves (containing 88 individuals) are identified as belonging to the Glazkovo mortuary tradition. More specifically, the pit of Grave 7 was aligned north–south, and the body was oriented with the head to the north, which is a pattern typical of Serovo graves in the Little Sea region of the Cis-Baikal (Goriunova 1997, 2002; Goriunova and Khlobystin 1992; Kharinskii and Sosnovskaia 2000, Weber et al. 2002). All other graves at KN XIV, with minor albeit frequent deviations, were oriented west–east with the head to the west.

In all, 93 bone samples from 74 graves were submitted for radiocarbon dating, representing 85 of the 89 individuals at KN XIV. The osteological remains of four individuals (Nos. 3, 37.3, 41, and 42) were too poor for any kind of laboratory analysis, including ^{14}C dating, and one grave contained no skeletal remains at all (Grave 30). Out of these 93 bone samples, 87 radiocarbon dates were produced for 79 individuals from 70 graves. Six of the submitted samples contained insufficient collagen to obtain a date, while duplicate dates were produced for eight of the burials in an attempt to obtain higher collagen yields. All dates are presented in Table 3.1 and Figure 3.4, but for all other tables and figures I only include the duplicate date with the highest collagen yield or, in the case of graves with multiple individuals, a single combined date (see below). With the exception of two standard radiocarbon dates produced for Burials 2 and 4 at the Institute of Geography, Russian Academy of Sciences, Moscow, all sample processing and dating was done at the Accelerator Mass Spectrometry Facility of the IsoTrace Radiocarbon Laboratory, University of Toronto, Canada, using the Libby ^{14}C half-life of 5568 years.

KN XIV radiocarbon dates were calibrated using Calib 4.4 with the INTCAL98 data set (Stuiver et al. 1998; Table 3.1). In this discussion, uncalibrated dates are quoted in radiocarbon years BP (before present), while calibrated dates are presented as ranges in calendar years BC (before Christ). The statistical package BCal was used to estimate the duration of cemetery use as well as to identify potential outliers as a means of dividing the cemetery into different phases of site use. Other statistical tests are described throughout the text.

For meso- and macroscale analyses, an available set of 105 ^{14}C dates from other Late Neolithic and Early Bronze Age burials in the Cis-Baikal region was assembled from the literature: 39 dates come from 10 cemeteries in the Angara valley, 35 dates from 11 cemeteries in the Little Sea area on Lake Baikal, 4 dates from a single cemetery on South Baikal, and 31 dates from 9 sites in the Upper Lena valley (Figure 3.1, Table 3.2). In order to make this material more compatible with the KN XIV data set, only radiocarbon dates done on human bone were selected. Most of these determinations were performed in Russian laboratories (Moscow and Novosibirsk) using the conventional dating method. With regards to the Khuzhir cemetery on Ol'khon Island (Little Sea), the two available Russian dates (Burials 1972-2 and 1973-3 [Mamonova and Sulerzhitskii 1989]) are not presented here because more recent AMS dates have since been obtained. In both cases, the conventional and AMS dates match each other very well. In cases where duplicate AMS dates are available for the same individual (Khuzhir, Burial 1972-2 and 1973-3), only those dates with the higher collagen yields are considered (see discussion of collagen yields below).

Typological classification of all graves was taken from the available literature and is based on archaeological criteria similar to those used to identify Grave 7 at KN XIV as Serovo. As documented in Chapter 2, characteristics such as grave and burial orientation relative to cardinal directions or topographic characteristics (i.e., riverbank or lakeshore), body position, associated grave goods, and elements of mortuary ritual are most frequently used (Goriunova and Khlobystin 1992, Weber et al. 2002). Aside from the fact that the previously published dates come from two different labs, and that collagen yields are not reported for any previous cemeteries, there are two other reasons why this comparative data set is less reliable than the one available for KN XIV; both relate to the question of sample size and representation. While Sarminskii Mys and Khuzhir (on Ol'khon Island) have been very likely excavated completely, this is less certain for most other sites. At Verkholensk (Okladnikov 1978) and Shumilikha (Svinin 1981) we know there are more graves in the ground, for they are still being exposed along the eroding riverbanks. Several sites (e.g., Ust'-Uda, Bratskii Kamen', and Semenovo) were excavated under severe time constraints prior to the construction of the Bratsk Reservoir on the Angara River in the 1950s (Okladnikov 1975, 1976), and a few other sites were only subjected to small-area (e.g., Borki and Obkhoi [Okladnikov 1971]) or test (e.g., Korkino and Shrakshura) excavations. In addition, the number of ^{14}C dates available for these sites is highly variable. For example, of the approximately 30 graves excavated at Uliarba on Lake Baikal (Ziablin 1959), we only have four dates on human bone; at Ust'-Uda on the Angara, only two out of 25 graves are dated; and for Obkhoi there are dates for 8 of 17 excavated graves. In sum, these sampling inconsistencies require a cautious approach.

For microscale analysis at KN XIV, radiocarbon dates were calibrated to make it possible to discuss estimates of the duration of cemetery use in the more appropriate calendar years. However, because the large number of archaeological sites and dates used in regional analyses makes written and graphic presentation of calibrated dates difficult, I instead use radiocarbon age BP for these discussions. For easier referencing, the culture-history model, introduced at length in Chapter 2, is summarized in the following chart with dates in both Radiocarbon age BP and Calibrated age BC.

Period	*Culture / Mortuary complex*	*Radiocarbon age BP*	*Calibrated age BC*
Late Mesolithic	Early Kitoi	c. 8000–7000	c. 6800–5800
Early Neolithic	Late Kitoi	c. 7000–6100	c. 5800–4900
Middle Neolithic	Hiatus	c. 6100–5300	c. 4900–4200
Late Neolithic	Early Serovo-Glazkovo	c. 5300–4800/4400	c. 4200–3400/3000
Bronze Age	Late Serovo-Glazkovo	c. 4800/4400–3300	c. 3400/3000–1000

3.2 EVALUATION OF THE KHUZHIR-NUGE XIV RADIOCARBON DATA

Evaluation of the set of radiocarbon dates from KN XIV will be undertaken here from the perspective of various factors that may have influenced its quality, by which is meant both the accuracy and the precision of the obtained measurements. In general, *accuracy* indicates how close a measured value is to the true value, while *precision* indicates how close together or how repeatable the measurements are. In the context of radiocarbon dating, standard deviation is the most frequently employed expression of precision; however, there are few standardized measures for reporting accuracy. In order to assess the accuracy of radiocarbon dates at KN XIV, repeat tests were performed on the same bone, dates were derived from more than one individual in multiple graves, and collagen yields of the bone samples from which the dates were derived were examined. I will also discuss some of the unique challenges associated with interpretation of large numbers of radiocarbon dates, which is not nearly as straightforward a procedure as it is often presented (Buck et al. 1994).

Although archaeologists rarely report the collagen yields of the bone samples used to obtain radiocarbon dates, Taylor (1997) notes that bones with less than 5% of their original protein (approximately equivalent to a 1% collagen yield) can produce anomalous (i.e., inaccurate) ^{14}C values if contamination is present (see also Ambrose 1990, van Klinken 1999). At KN XIV, only 28 of the 79 (35%) individuals for which ^{14}C dates were obtained returned collagen yields greater than 1%, and repeat tests on bone samples with very low collagen yields produced statistically non-concordant dates in seven out of eight cases (Table 3.3), indicating clearly that some degree of contamination existed. A scatter plot (Figure 3.4) reveals an obvious correlation between decreasing collagen yield and increasing variance in radiocarbon dates, again suggesting that at least some of the low-collagen samples were contaminated and thus likely inaccurate. The graph also appears to confirm that a collagen yield of 1% is a reasonable cutoff for accuracy, since dates below this level are much more variable than those above it. Note, however, that even high-collagen dates (>1%) at KN XIV show a general correlation between increasing yields and decreasing variance, which means that any cutoff level is subjective.

The fact that a collagen yield of 1% appears to be an acceptable cutoff for the Little Sea area of Lake Baikal is, itself, interesting since Taylor's rule-of-thumb (1997:91) was derived from research in Western European situations with high peat content and North American contexts with high soil acidity. Given the topography of KN XIV, and the fact that in seven out of the eight repeat tests the sample with the higher collagen yield produced the youngest date, it is likely that soil acids transferred from subsurface spring runoff degraded the bone collagen, allowing contamination with older material. This is unsurprising when one considers that all of the graves at KN XIV were built directly on bedrock, with little sediment fill to seal the remains against external elements.

Although a collagen yield of 1% seems to be broadly applicable to the KN XIV data, it appears that some of the dates derived from low-collagen samples are also generally accurate. For example, despite having the lowest collagen yield (0.04%) of any bone sample at KN XIV, Burial 7 produced the oldest radiocarbon date, which appears to confirm the assignment of this grave to the earlier Serovo period based on typological criteria. For this reason, Grave 7 is included in the discussion; however, it is recognized that its date may not be entirely accurate beyond the fact that it is older than any of the KN XIV Glazkovo dates and, consequently, it is not included in any statistical analyses.

We can also use graves from which more than one individual was dated in order to identify other accurate low-collagen dates (Figure 3.5; Table 3.4). First, the low-collagen date from Burial 59.1 is not statistically different from the high-collagen date from Burial 59.2 suggesting that the low-collagen date is also accurate. Likewise, the low-collagen date from Burial 80.1 is not significantly different from the high-collagen date from Burial 80.2 again suggesting that the low-collagen date did not suffer from contamination. In each case, Ward and Wilson's (1978) Case I T-statistic was used to evaluate significance. The T-statistic is appropriate for situations where it can be assumed that one is estimating dates relating to the same event or chronologically indistinguishably different events (Ward and Wilson 1978). Although estimates on different objects do not strictly meet this definition, the fact that at KN XIV the architecture of graves with multiple burials indicates that the interments were synchronic permits us to assume that the events are indistinguishable. In addition, Ward and Wilson's Case II T'-statistic, which was designed to test the significance of two dates derived from different events, was developed at a time when calibrated dates were reported as means with standard deviations, rather than as multiple age ranges as is currently the accepted standard. As a result, the Case II T'-test is no longer appropriate and can produce errors (Christen 1994, Reimer personal communication). Statistically equivalent multiple dates from the same grave were pooled using Calib 4.4 in order to produce a single combined date. In all tables and figures, combined dates are indicated with the suffix "COMB" or an asterisk following the grave number (e.g., Grave 80-COMB or Grave 80*).

Although the dates from the two high-collagen Burials 35.1 and 35.2 only overlap at two standard deviations, the T-statistic indicates that the dates are not significantly different, and therefore they can also be combined. Note that before the two dates for Grave 35 were combined, Burial 35.1 was one of the oldest high-collagen Glazkovo burials, while Burial 35.2 was one of the youngest. After combining the two dates, it seems likely that the two individuals were interred much closer to the mean than either individual date would suggest, even though both were derived from high-collagen samples.

Multiple individuals were also recovered from Graves 27, 36, 57, and 58. In each case, dates overlap at one standard deviation (Figure 3.5). Unfortunately, in all instances the dates were derived from low-collagen bone samples, and since there is no independent evidence of reliable archaeological age for these events, it is difficult to determine whether the overlapping dates indicate accuracy or whether they indicate equal contamination. The fact that the dates from Graves 36 and 58 fall almost exactly on the mean (~3900 BP) and therefore do not contribute significantly to the variance might be taken as evidence that they did not suffer from contamination; however, there is need for caution in the significance we ascribe to the mean and variance. While the increased variance associated with decreased collagen yields is almost certainly the result of contamination, there is no inherent reason why the age of any particular interment at KN XIV should not vary from the mean. In fact, given that the age-at-death profile of the KN XIV population is not catastrophic (Lieverse 2004), there is no reason to expect every individual to date from the same time. As a result, it seems equally plausible that individuals from Graves 36 and 58 were interred at a date around the mean (i.e., the dates are accurate) as it does that they were all interred somewhat earlier or later but with artificially raised or lowered radiocarbon dates relative to the mean due to contamination. Without independent chronological criteria, then, we cannot accept overlapping low-collagen dates as evidence of accuracy.

In addition to accurate low-collagen dates, there is also one example of a high-collagen date that appears to be inaccurate. Burial 60 was dated twice, but the two radiocarbon determinations are statistically different from each other despite the fact that they are both derived from high collagen samples (Table 3.3). Since in this case the collagen yield on the first dating attempt was barely above 1% (1.1%), the date with the much higher yield of 8.2% is accepted. In the next section, when I attempt to identify meaningful patterns in the radiocarbon dates, it will be important to keep in mind the relative uncertainty associated with the accuracy of individual radiocarbon determinations at KN XIV, including those derived from high-collagen samples.

Overall, for most microscale analyses in this paper only those KN XIV dates derived from high-collagen bone samples (>1.0%) will be employed, along with the three combined dates from multiple graves (Graves 35-COMB, 59-COMB, 80-COMB). The date for the single Serovo Grave 7 is not included in any statistical analyses but is included in the discussion since it is the only grave with typological indicators of chronology. This leaves 27 Glazkovo dates to work with. While this approach will undoubtedly reject some accurate dates, it will also ensure that a large number of inaccurate dates will not be accepted.

Since collagen yields have not been published for other sites in the Cis-Baikal, we have no direct evidence to evaluate the accuracy of these dates, and I will discuss some of the consequences of this limitation during the interpretation of these datasets.

3.3 MICROSCALE PATTERNS OF CEMETERY USE THROUGH TIME AT KHUZHIR-NUGE XIV

The following two aspects of cemetery use are addressed in this section: the duration over which the cemetery was used and the tempo of site use. Each of these issues is important since, as mentioned above, none of the region's known Neolithic or Bronze Age cemeteries, small or large, have been dated by ^{14}C in a manner amenable to such examination. In particular, the available radiocarbon evidence for most sites suffers from inadequate sampling, insufficient numbers, or both. Similar observations are also applicable to other known hunter-gatherer cemeteries of comparable age in western Eurasia, such as Oleniostrovskii, Zvejnieki, Vaedbaek, Skateholm, Teviec, and Hoedic.

The various difficulties of establishing chronological sequences from radiocarbon dates alone are well documented (e.g., Buck et al. 1994). In addition to the numerous factors influencing the accuracy and precision of laboratory ^{14}C estimates, it is also necessary to calibrate these estimates with calendar dates in order to make meaningful chronological inferences (Aitken 1990, Bowman 1990). In worst-case scenarios, when the time interval between dated events is short compared to the standard deviation, and when the laboratory estimates lie on a flat section or inversion of the calibration curve, calibrated radiocarbon dates have limited use and may even produce incorrect sequences (Buck et al. 1994). Unfortunately, it appears that KN XIV presents us with just such a scenario. According to the calibrated high-collagen radiocarbon dates, the majority of graves were interred within a relatively short period compared to the standard deviation (Figure 3.6), and the peak of cemetery use does, in fact, lie on a section of the calibration curve that is relatively flat and divided by an inversion (~3900 BP; Figure 3.7). Despite the large number of radiocarbon dates available from KN XIV, then, it is not possible on this basis to reconstruct a burial-by-burial history of the cemetery. It may be possible, however, to use the radiocarbon information to derive inferences regarding the intensity and duration of site use.

The statistical package BCal offers one means of approaching these questions through the use of Bayesian statistical methods (Buck et al. 1996). In general terms, Bayesian applications evaluate how well radiocarbon determinations correspond to previously defined theoretical models that can incorporate prior knowledge derived from other sources (e.g., stratigraphy or typology). In the case of KN XIV, there is very little *a priori* knowledge beyond the observation that the single Serovo Grave 7 is likely older than any of the Glazkovo graves. Unfortunately, as discussed above, the extremely low collagen yield of the single Serovo date precludes its use in the statistical analysis. As a result, for the purposes of the BCal analysis, our theoretical model is characterized by a single group of Glazkovo (27 graves). Using this model as a base, BCal can be used to investigate how closely the radiocarbon determinations from KN XIV approximate this model.

The first step was to employ BCal's outlier detection protocol. While often used to identify "rogue" dates that likely suffered from contamination (Buck et al. 1996, Christen 1994), the outlier detection protocol can also be used to identify the probability that multiple dates belong to a single group or phase. This technique, however, involves a certain degree of subjectivity in the final identification and grouping of the outliers. Following the approach described by Christen (1994), all Glazkovo dates were modeled within a single group, and each grave was assigned a prior probability of 0.1 that it could be an outlier. In general, dates with posterior outlier probabilities meaningfully greater than their prior probabilities can be interpreted as likely outliers. After the first run of this protocol, a comparison of the posterior probabilities with the prior probabilities reveals, as expected, that Grave 80 is clearly an outlier as are Graves 59-COMB and 68 (Table 3.5). Successive runs were conducted with the most obvious outliers removed at each step until no additional outliers were detected. In total, given the prior model of all Glazkovo graves belonging to a single group, 19 of the 27 graves (70%) were identified as belonging to this one group, and eight graves were identified as outliers – the four oldest graves (15%) and the four youngest graves (15%). When the same protocol was applied to the collection of four young outliers (Graves 59-COMB, 68, 12, 64), no further outliers were identified indicating that these four graves likely belong to a single group. Within the cluster of four old outliers (Graves 49, 50, 38, 80), Grave 80 was once again identified as an outlier (0.18 posterior probability) indicating that these four graves should be divided into two additional groups. In sum, then, it might be possible to divide the dates from KN XIV into five phases: the single Serovo Grave 7 (Phase 1 – defined primarily on typological grounds), the single Glazkovo Grave 80 (Phase 2), Graves 49, 50, 38 (Phase 3), Graves 47, 79, 61, 16, 86, 40, 85, 84, 53, 75, 45, 11, 39, 70, 60, 74, 17, 15, 35-COMB (Phase 4), and Graves 59-COMB, 68, 12, 64 (Phase 5). Virtually identical results were obtained using a Markov Chain Monte-Carlo (MCMC) sampling procedure in the OxCal statistical package (Bronk 1995, 2001, 2003).

The next step was to estimate the likely timing and duration of cemetery use. BCal calculates the highest posterior density (HPD) region (95% probability level) of the posterior distributions for the modeled beginning (α) and end (β) of cemetery use as well as for the interval between these two parameters (Buck et al. 1996). When all 27 high-collagen Glazkovo dates are included, the HPD region (95% probability) for α is approximately 2700–2490 BC and for β is approximately 2190–2020 BC. The estimated duration of the HPD interval between α and β is between 340–660 calendar years (Figure 3.8). When all eight identified outliers are removed, we find that 19 of the 27 high-collagen Glazkovo graves (70%) were interred within a period shorter than 200 calendar years between 2500–2360 BC and 2450–2270 BC (Figure 3.9). Both of these final two estimates for the duration of the Glazkovo component of the cemetery are considerably narrower than a visual examination of the original distribution dates (Figure 3.3) would suggest.

Overall, then, it appears that after a single Serovo interment (Grave 7, 4600–3100 BC), KN XIV was used continuously by Glazkovo peoples for somewhere between 340 and 660 years between approximately 2700 and 2020 BC. The tempo of site use seems to have varied, beginning with a low intensity early period (Phases 2–3) in which approximately 15% of all Glazkovo burials were interred. This was followed by a peak period (Phase 4) centered around 2400 BC (~3900 BP) during which 70% of all burials interred in fewer than 200 calendar years. Following the peak, there appears to have been another low-intensity interval of site use during which the remaining 15% of individuals were buried. Before accepting this model, however, it is necessary to discuss an alternative explanation for the observed patterns.

As mentioned above, an outlier detection protocol is often used to identify radiocarbon determinations that may have been subject to various forms of error including such factors as contamination and measurement error. How, then, can it be determined whether a date is an outlier due to various types of measurement errors, or because it belongs to a different temporal group? This problem appears to be especially acute at KN XIV where a Shapiro-Wilk Test confirms that the distributions of both high-collagen Glazkovo dates (S-W(26)=.948 p=0.205)[2] and low collagen Glazkovo dates (S-W(50)=0.982, p=0.643) are statistically normal. This is an important observation because there are at least two reasons why the dates at KN XIV might be normally distributed, and each has different implications for how to interpret the patterns of site use proposed above.

First, it is a general principle in archaeology that a normal distribution reflects a temporal progression of the life-history of a cultural trait from an introduction through a period of efflorescence and, finally, to a period of waning popularity and the ultimate disappearance from the archaeological record. In this particular case, the relevant cultural trait is the cemetery, and the measurement represents the number of times it is used over a certain time interval. With respect to KN XIV, this interpretation of the radiocarbon dates would indicate that the cemetery was founded, and then it had an initial period of low intensity use that gradually increased to a peak around 2400 BC (~3900 BP), followed by a gradual decrease in use until the cemetery stopped being used altogether.

This is an entirely reasonable expectation for the life history of any cemetery and fits well with the actual distribution of dates and the proposed phases of site use described above. Besides various life-history models such as that just described, however, normal distributions are also a product of the stochastic nature of measurement error. Imagine a

[2] High collagen dates used in this calculation are those presented in Table 3.5, excluding the extreme outlier (Grave 80). Low collagen dates used in this calculation are from all graves not presented in Table 3.5. Where duplicate low collagen dates exist for a single grave, only the date with the highest collagen yield was employed.

situation in which every burial at KN XIV had been interred in the same year—say 2400 BC. In this case, by dating each individual we would, essentially, be measuring the same event multiple times, and we should expect some measurements to be older and others to be younger for purely stochastic reasons. The cumulative effect of these measurement errors would be a normal distribution around a mean of 2400 BC, which, as I have discussed, is exactly the distribution observed at KN XIV. When this source of error is combined with the inherent inaccuracy and imprecision of radiocarbon dating, as well as the additional errors introduced by contamination discussed above and the various challenges of calibration, it becomes clear that it would not even be necessary for all of the individuals to be interred at exactly the same time. Instead, the same effect would also result if all of the individuals were buried at a more or less constant rate within a relatively short period of cemetery such as, say, the c. 200-year peak suggested by the group of 19 high-collagen dates in Phase 4. This is important because, as already mentioned, the known demographic distribution of KN XIV does not support a catastrophic age-at-death profile (Lieverse 2004) as would be expected if every individual was interred relatively simultaneously.

Another consideration is the possibility that both life-history and stochastic processes may be at work, which would have predictable effects on the shape of the posterior distribution. If the original distribution of graves was normal as the result of a life-history model such as that described above, then stochastic measurement error would widen and flatten this distribution since dates at the two tails could randomly move outwards but no dates exist outside of the tails to move randomly inwards. Similarly, if the original distribution was even over a given period, stochastic measurement error would also produce a wider and flatter normal distribution. In both cases, the duration of cemetery use would appear to be longer than it actually was, and the tempo of site use would approximate a normal distribution. Given this, it appears that the shorter end of the previously estimated 340–660 year interval for the continuous Glazkovo use of KN XIV is a more likely scenario. As I will discuss in the next section, the same considerations may generally apply to regional temporal distributions in the Cis-Baikal.

Overall, then, how are we to determine whether the normal distribution of the KN XIV radiocarbon dates is a statistical artifact or whether it is a genuine reflection of the life history of the cemetery? Put another way, how are we to determine to what extent the outliers identified above reflect different phases of site use and to what extent they reflect errors? Unfortunately, there is no simple solution to this problem. None of the available statistical packages offer tools to test posterior radiocarbon distributions against prior models that do not assume an even distribution of events through time, although one such application is currently in development (Buck, personal communication). In addition, the chronological distribution of mortuary variability at the site is of little help, since virtually every individual mortuary attribute[3] exhibits the same normal distribution around ~3900 BP as do the radiocarbon dates (Figure 3.10); thus, we are left with the same problem of trying to determine whether the distribution of mortuary traits around the mean is the result of diachronic cultural processes or statistical errors.

In general, it seems more likely that the original tempo of cemetery use at KN XIV would have featured a normal or near-normal distribution than a pattern of even use through time. The duration of this normal distribution is not entirely clear, but as noted above, it seems prudent to assume tentatively that the shorter end of the estimated 340–

[3] Detailed description of these variables is provided in Chapter 4.

660 year interval is more likely than the longer end because of the potential for stochastic widening. Beyond this, however, it seems rather difficult to gain more detail about the original distribution.

In relation to mortuary variability, if the temporal distribution of mortuary attributes is taken at face value, Phases 3 and 5 appear virtually identical, while the intervening peak period (Phase 4) exhibits not only a greater number of burials, but also a greater diversity of practices as evidenced by the inclusion of subadult individuals, a greater variety of grave inclusions, and the use of different spatial clusters (Figure 3.10). The possibility that the site may have undergone such a cyclical change in mortuary expression is intriguing (Cannon 1989); however, given that there are only reliable dates for 27 of the 78 Glazkovo graves, that 19 of these dated graves come from the peak period, that at least some of the temporal distribution outside of the peak period may be a result of statistical processes, and that the increased diversity in practices during the peak period may simply be a function of the higher number of graves, it is likely more appropriate to treat the cemetery as a single chronological unit (excluding Graves 7 and 80). Either way, the lack of any major changes or discontinuities in mortuary practices at the site through time, would seem to suggest that the site reflects enduring social practices that remained meaningful over numerous generations. The nature of these enduring practices is explored in Chapter 4.

3.4 MESO- AND MACROSCALE PATTERNS OF CIS-BAIKAL CEMETERY USE

In addition to microscale patterns of cemetery use, the extensive radiocarbon data from KN XIV also enable discussion of larger scale patterns to address previously neglected problems of regional expressions of mortuary variability, both in the immediate vicinity of KN XIV (mesoscale) and between the three major microregions (macroscale). In particular, I will examine the chronological relationships between KN XIV and neighbouring cemeteries and relationships between cemeteries across microregions. These analyses will facilitate a reevaluation of existing models and perspectives on the place of the Glazkovo tradition within the region's Neolithic and Bronze Age, as well as an evaluation of how useful radiocarbon dates are in refining regional culture-histories. Figure 3.11, in which the KN XIV dates are compared with radiocarbon dating of other cemeteries from the three microregions (Angara and Upper Lena valleys, the Baikal coast), allows a few initial observations.

First, the long distribution of the entire set of KN XIV ^{14}C dates parallels very closely the chronological range of all other Serovo and Glazkovo ^{14}C dates in the entire Cis-Baikal. When only the high-collagen Glazkovo dates from KN XIV are examined, the site parallels perfectly the other Glazkovo dates from the Baikal coast microregion, but is somewhat more compact than the distributions from the Angara and Upper Lena valleys. Given that there are no direct data to assess the effects of collagen preservation and sample contamination at other Glazkovo cemeteries in the same way as KN XIV, it is difficult to interpret these patterns. On the one hand, the wider distribution of dates in the Lena and, especially, Angara Valleys may reflect the same low-collagen, contamination and stochastic effects as encountered at KN XIV, in which case the actual distribution would be narrower than that indicated by the dates. On the other hand, burials in the Angara and Upper Lena valleys were, in general, both better sealed with alluvial sediment and better preserved than those from the Baikal coast (especially from the Little Sea area). The fact that the radiocarbon dates from Glazkovo burials in the Upper Lena valley correspond relatively well to those from KN XIV may reflect this observation. In addition, recent AMS radiocarbon dates from Ust'-Ida on the Angara River returned substantially higher collagen yields than at KN XIV, with 50 dates out of 64 (78%) displaying levels >1% (Weber et al. 2005). As a result, it seems likely that the Angara and Upper Lena microregions were not affected by low-collagen yields to the same degree as KN XIV, which would suggest that the distributions are relatively accurate. Regardless of the combined effects of contamination and collagen preservation, the stochastic widening and flattening of the distribution is still a factor, but it is difficult to assess to what extent.

Next, the single Serovo grave from KN XIV fits within the distribution of Serovo graves across the entire Cis-Baikal (~5500–4400 BP). There are two exceptions to this pattern. The first is the distribution of Serovo dates from the Baikal coast, which spans a very long range from approximately 5900 to 2500 BP, and the second is the single date from the Upper Lena valley from around 3200 BP. However, virtually all of the anomalous Serovo dates (i.e., very early or very late) from the Baikal coast microregion come from the single cemetery of Sarminskii Mys, located around 2 km northeast of KN XIV. Given that the cemetery is located so close to KN XIV, and that the graves were built in the same manner, it seems likely that low-collagen and contamination are partly responsible for the wide distribution of these dates. More important, however, is the fact that all Serovo burials at Sarminskii Mys were extensively charred (Goriunova 1997), thus compromising further the accuracy of radiocarbon dates. In fact, the same can be said of KN XIV where, of the 20 burials exhibiting charring of skeletal elements, only one (No. 85) returned a high-collagen radiocarbon date, and even this date's collagen yield (1.3%) was barely above 1%. The interpretation that charring compromised the radiocarbon dates is further supported by the fact that the distribution of dates from the Glazkovo graves at Sarminskii Mys, which were not charred, is almost identical to the distribution of high-collagen Glazkovo dates from KN XIV. Overall, then, there seems to be good reason to discard all the Serovo dates from Sarminskii Mys, but that the Glazkovo dates should be retained (see also Goriunova 1997, 2002). Also, both of the late determinations recorded at Verkholensk and Shrakshura II come from graves in which the use of fire was documented (Okladnikov 1978:48, Goriunova 1997:63).

Next, the chronological distribution of post-hiatus groups (Serovo and Glazkovo) is very similar over the entire Cis-Baikal. The Glazkovo appears somewhat earlier in the Angara valley than in the other two regions, but disappear at around the same time. With the exception of the Grave 7 date at KN XIV, no other Serovo dates on the coast of Baikal, with Sarminskii Mys again excluded, are found earlier than 5000 BP as they are in the other regions. The small number of dates may, however, be a factor, as may the fact that the single Serovo date at KN XIV was derived from a low-collagen bone sample. While in all regions the Serovo and Glazkovo groups appear to be fairly distinct from each other in chronological terms, the temporal overlap between them appears to exist for a few hundred radiocarbon years in the Upper Lena and Baikal microregions excluding

Sarminskii Mys, and perhaps for as much as 600 radiocarbon years in the Angara valley. As discussed in more detail below, however, caution is necessary in interpreting this overlap since there is no way of assessing collagen yields for Angara and Upper Lena dates, and the stochastic widening and flattening would cause sequential distributions to merge at the tails. As such, the observed chronological overlap should likely be considered the maximum amount of time the Serovo and Glazkovo traditions coexisted, with the recognition that it very well could have been shorter.

Finally, within each of the three main microregions of the Cis-Baikal there were many smaller and larger cemeteries likely used concurrently. In the Little Sea area, for example, the KN XIV, Khuzhir-Nuge VI (~15 still unexcavated Serovo graves [Goriunova 1997]), Sarminskii Mys (13 Serovo and 13 Glazkovo graves [Goriunova 1998, 2002; Goriunova et al. 1998]), and Uliarba (~30 Glazkovo graves [Goriunova 2004; Ziablin 1959]) cemeteries are all located within a distance of only about 3 km. To date, the relationships between these cemeteries have not been explored, and this issue is addressed in Chapters 5 and 6.

3.5 DISCUSSION AND CONCLUSIONS

The analyses presented in this chapter have produced some important insights with regard to both the methodological aspects of analyzing long series of ^{14}C dates derived from human bone as well as chronological patterns of Cis-Baikal cemetery use at micro-, meso-, and macroscales of analysis.

3.5.1 Discussion of Methodological Conclusions

The chronological data obtained for KN XIV provide an excellent case study on the analytical methods for large sets of radiocarbon dates. This study demonstrates that even though large radiocarbon datasets offer improved confidence in the derived observations, they are still beset by limitations and interpretive difficulties inherent to the radiocarbon method in general, and specifically to the use of bone samples. In particular this study presents two major methodological conclusions.

First, bone samples in Cis-Baikal with collagen yields lower than 1% are significantly more likely to suffer from the effects of contamination. As the dates from Serovo graves at Sarminskii Mys suggest, this problem appears to be especially important in cases where bone has been exposed to the effects of fire. While this conclusion is not at all surprising, the fact that collagen yields have never been accounted for in previous analyses of Cis-Baikal radiocarbon dates has almost certainly contributed to the apparent lack of agreement between radiocarbon and typological dating methods, and the consequent reluctance of some scholars to accept the use of radiocarbon dates to refine local chronological sequences (e.g., Aseyev 2002, Goriunova 1997, 2002, Goriunova et al. 2004). Indeed, as noted above, Goriunova (1997:97-99) explicitly cites the inconsistent Serovo dates from Sarminskii Mys as evidence in favour of typological and stratigraphic methods. The analysis presented here was able to identify explicit reasons why some Serovo dates were inconsistent. Consequently, given that we now have a methodology for identifying inaccurate dates, the use of the radiocarbon method in the Cis-Baikal would appear to have a stronger foundation. Therefore, it seems useful to recommend that a practice of reporting collagen yields on ^{14}C dates obtained from bone samples be accepted as standard protocol not only in Cis-Baikal, but also by the archaeological community at large. Radiocarbon laboratories should also adopt the standard of including the collagen yield data on their reports, which is far from common practice.

The second major methodological finding is that stochastic measurement errors must be considered when dealing with large datasets since these errors have the effect of creating a distribution of dates that is artificially wider and flatter than the original distribution. As mentioned above and discussed in more detail below, this conclusion has serious consequences for estimating the durations of both individual cemetery use and regional expressions of mortuary practices. As far as I am able to determine, this effect has never been comprehensively discussed in the context of dating archaeological materials. Thus, the methodology introduced here provides a useful approach to recognize and account for such errors during interpretation and, as such, it has great potential to help clarify chronological patterns at other Cis-Baikal cemeteries and elsewhere.

3.5.2 Discussion of Microscale Patterns of Cemetery Use

The analysis presented in this chapter demonstrates that examination of extensive radiocarbon data from a single cemetery using a methodology that considers collagen yields in combination with Bayesian statistical methods can provide important information on a range of chronological patterns at the level of individual cemeteries.

First, it was revealed that, after excluding low collagen dates and taking into account the stochastic widening and flattening of the distribution of dates, KN XIV was used continuously by Glazkovo peoples for somewhere between 340 and 660 years between approximately 2700 and 2000 BC. This is considerably shorter than the entire radiocarbon dataset would suggest at first glance.

Second, when examined as a whole, the restricted duration of use, absence of discontinuities, and the unimodal nature of the temporal distribution provide strong evidence that the Glazkovo component of the KN XIV cemetery may be treated as a single analytical unit. Furthermore, the lack of temporal variation in most aspects of mortuary practice at KN XIV suggests that the site reflects enduring social practices that were repeated over numerous generations. Most analyses of prehistoric mortuary practices, especially those of hunter-gatherers, are based on *a priori* assumptions regarding the temporal scale (diachronic or synchronic) and cultural continuity of the examined material. Typically, such assumptions are rather weak because they are extremely difficult to support with empirical evidence. In the case of KN XIV, however, such assumptions appear to be reasonably justified. The next step is to determine the nature of the social practices employed by fully analyzing the structure of mortuary variability at the site (Chapter 4).

Finally, it was demonstrated that KN XIV may have experienced changes in intensity of use through time, and if so that the tempo was likely one that approximated a normal distribution. More specifically, the site use likely began with a low intensity early period in which approximately 15% of all Glazkovo burials were interred. This was followed by a peak period centered around 2400 BC during which 70% of all burials interred in a period of fewer than 200 years. Following the peak, there appears to have been another low-intensity interval of site use during which the remaining 15% of individuals were buried.

3.5.3 Discussion of Meso- and Macroscale Patterns of Cemetery Use

An examination of radiocarbon dates in the Cis-Baikal has revealed a number of important meso- and macroscale chronological patterns. First, it was demonstrated unequivocally that numerous cemeteries in the Little Sea microregion were used concurrently with KN XIV, including Khuzhir-Nuge VI, Sarminskii Mys, and Uliarba. At present, the relationships between cemeteries and the regional nature of mortuary practices in Cis-Baikal has not been explored except in the sense of establishing their relative placement within regional culture-historical models. Given the close spatial and temporal proximity of these sites, it is clear that they must have been perceived as part of a single cultural landscape. The fact that many of these sites contain both Serovo and Glazkovo graves—many of which are so spatially integrated that it is impossible to distinguish between them on the surface—suggests that this cultural landscape has considerable temporal depth. The nature of this mortuary landscape, however, is unclear. Were contemporary neighbouring cemeteries used by different social groups occupying the region at the same time, or did a single group use multiple cemeteries for different reasons? These questions are considered in Chapters 5 and 6.

The second general finding is that, on the basis of available radiocarbon data, there is little indication that either Serovo or Glazkovo appeared in any part of the Cis-Baikal substantially earlier than any other part. Likewise, the end of the Serovo and Glazkovo periods appears to be similar across the entire region. The only possible exceptions to this pattern are the slightly older dates for Glazkovo burials in the Angara valley, and the slightly more compressed chronology of the Lake Baikal Coast compared to other regions. That is, the Serovo period begins slightly later in the Baikal microregion than in other areas, and the Glazkovo period ends slightly earlier; however, this may simply be the result of the comparatively fewer radiocarbon dates available from this area. Unfortunately, then, the radiocarbon data do not provide any clues as to the direction of the homeland of the Serovo or Glazkovo populations, which are assumed to have immigrated to the region around 4000 BC.

Third, the durations of the Early Neolithic, Late Neolithic, and Early Bronze Age, and of the mortuary traditions associated with them, is likely substantially shorter than described in the current culture-history model as outlined by Weber (1995) and Weber et al. (2002). In contrast, the duration of the only period defined on the basis of the absence of the radiocarbon evidence—namely, the Middle Neolithic hiatus—is likely appreciably longer. The chronological boundaries of the current model were developed by evaluating the radiocarbon evidence available at the time (Weber 1995). However, neither the stochastic widening and flattening of the distributions, nor the effects of variable collagen yields were taken into consideration (Weber 1995; Weber et al. 2002). Thus, the Middle Neolithic hiatus, originally assessed to last approximately 600–800 years, now appears to extend for as long as 1,200 years, or even longer. Furthermore, in spite of the extensive radiocarbon dating of Cis-Baikal mortuary complexes, which generated close to 400 radiocarbon dates for both the Kitoi and Serovo-Glazkovo cultures, no new dates have fallen into the gap. For similar reasons, if the distributions of Serovo and Glazkovo radiocarbon dates are also widened by stochastic effects, then it seems likely that the degree of overlap between these two groups is smaller than the distribution of radiocarbon dates suggest (e.g., Weber et al. 2002).

Together, these results have serious consequences for our understanding of Cis-Baikal culture-history. In particular, the relationship between the Serovo and Glazkovo appears to require reevaluation. As noted in Chapter 2, based primarily on an early examination of radiocarbon dates, Weber (1995) and Weber et al. (2002) advocated combining the Serovo and Glazkovo groups into an early and late form of the same tradition: Serovo-Glazkovo. At the same time, they acknowledged that the relationship between the two groups is complex and would require a comprehensive reexamination in which the extensive use of radiocarbon dating would be essential (Weber et al. 2002). Given the effects of collagen yields and stochastic widening and flattening, it would appear that Glazkovo and Serovo mortuary traditions only overlapped for a very short period of time, if at all, in the Baikal and Upper Lena regions, and perhaps only slightly longer in the Angara valley. In fact, most of the overlap observed by Weber (1995) was based on dates from the sites of Sarminskii Mys and Verkholensk where, as discussed, Serovo dates were likely inaccurate because of the use of fire and low collagen yields. Given this, I suggest that the chronological distinction between the two groups, long cited by Russian archaeologists, is valid, and consequently I recommend that the Serovo-Glazkovo analytical unit be uncoupled to reflect this situation. Having said this, I do not believe that this invalidates the suggestion of Weber et al. (2002) that the two groups are related in more complex ways than has generally been appreciated. As previously noted, the material culture of the two groups is very similar in a number of respects (Gerasimov 1955; Weber et al. 2002), recently obtained mtDNA data suggests biological continuity between the Serovo and Glazkovo groups (Mooder et al. 2003; Mooder et al. 2005, n.d.), and numerous mortuary sites exist that contain both Serovo and Glazkovo graves that are so spatially integrated that it is impossible to distinguish between them on the surface (e.g., Ust'-Ida, Verkholensk, and Sarminskii Mys). All of these factors clearly indicate that some sort of cultural affinity existed between the two groups (Weber 1995; Weber et al. 2002).

One intriguing possibility, recently introduced by Weber et al. (2005), views the Serovo as a period of incipient complexity that eventually develops into the more fully complex Glazkovo. Preliminary data suggest that Glazkovo cemeteries are both more numerous and larger than Serovo sites, which would tend to support this hypothesis; however, to date there has been no systematic analysis of site size and distribution in Cis-Baikal.

Overall, the analyses presented in this chapter have clarified chronological patterns of Cis-Baikal cemetery use at micro-, meso-, and macroscales of analysis, including some rather important observations regarding our current understanding of the region's culture-history. In addition, some useful insights were produced with regard to the methodological aspects of analyzing long series of ^{14}C dates derived from human bone. These conclusions, in addition to contributing to the general program of research in the Cis-Baikal, will also provide the temporal context for the investigation of mortuary variability in the remaining chapters of this dissertation.

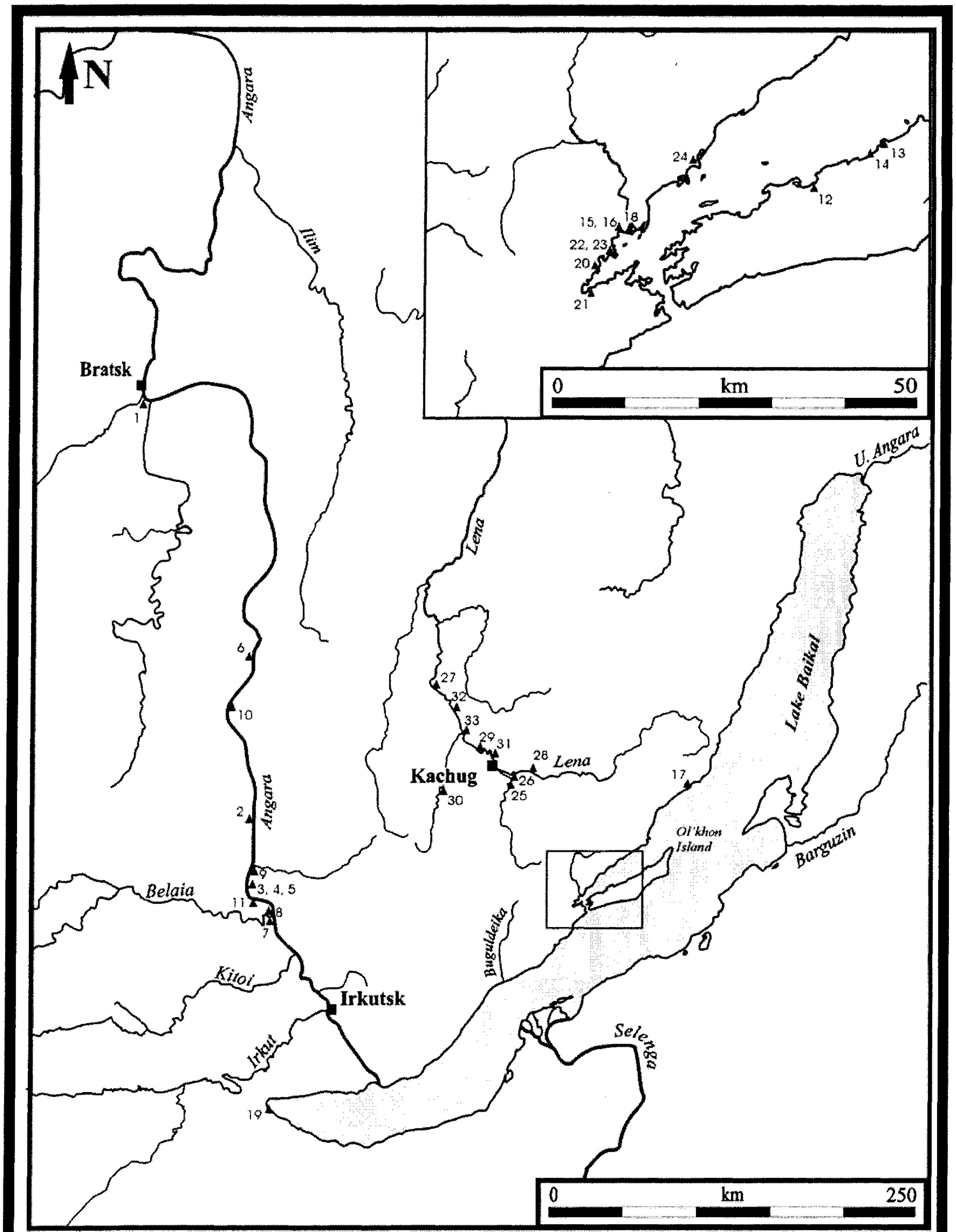

Figure 3.1: Map of Cis-Baikal and location of archaeological sites mentioned in text. Angara: 1–Bratskii Kamen', 2–Nizhne Seredkino, 3–Semenovo, 4–Semenovo I, 5–Semenovo II, 6–Serovo, 7–Shumilikha, 8–Ust'-Belaia, 9–Ust'-Ida, 10–Ust'-Uda, 11–Verkhniaia Buret';Baikal: 12–Elga III, 13–Kharansa I, 14–Khuzhir, 15–Khuzhir-Nuge VI, 16–Khuzhir-Nuge XIV, 17–Kulgana, 18–Sarminskii Mys, 19–Shamanka II, 20–Shrakshura II, 21–Sokhter, 22–Uliarba I, 23–Uliarba II, 33–Kurma XI;Upper Lena: 24–Borki, 25–Khaptsagai, 26–Korkino, 27–Makrushina, 28–Mys Nikol'skii, 29–Obkhoi, 30–Staryi Kartukhai, 31–Ust'-Iamnoe, 32–Verkholensk

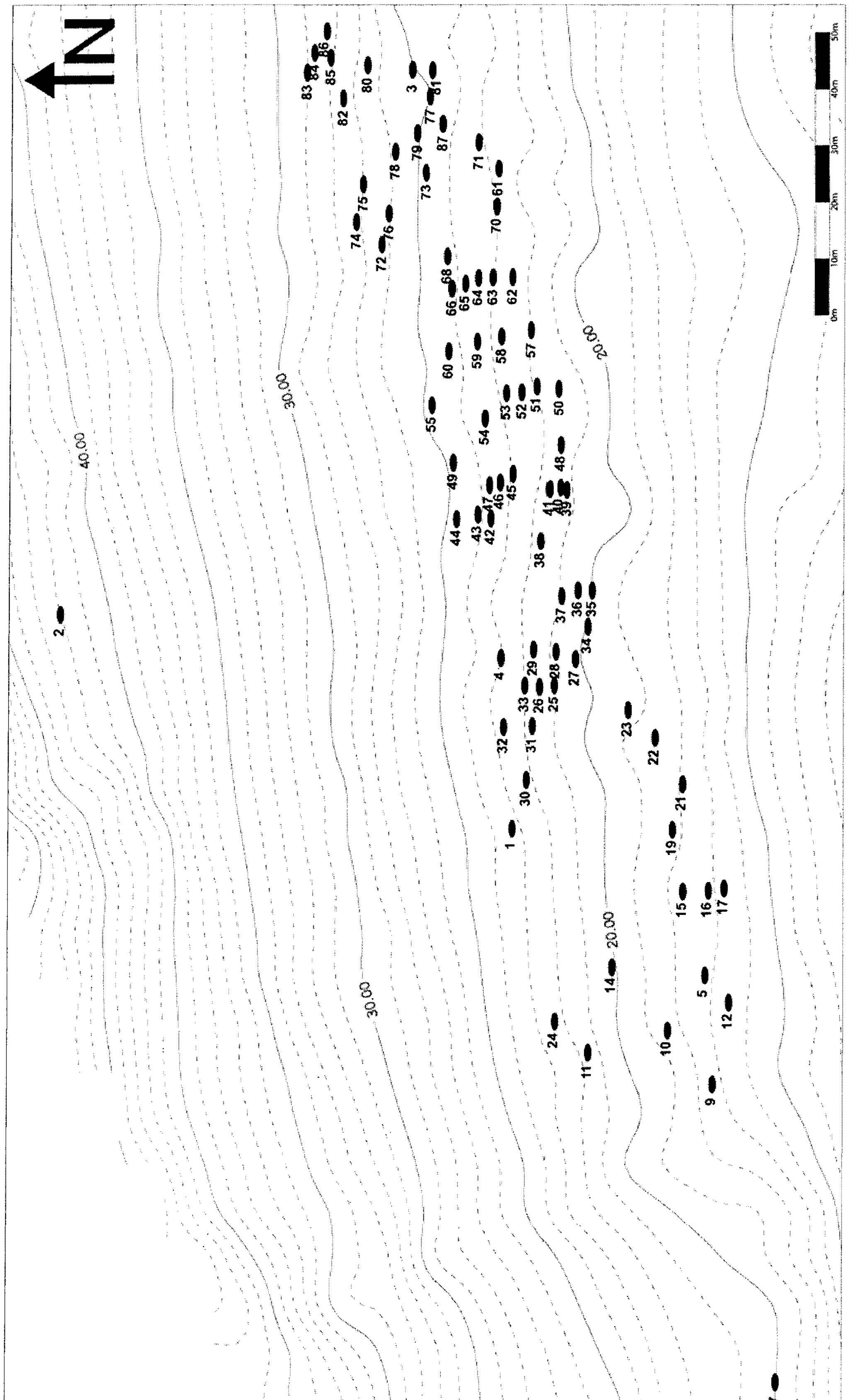

Figure 3.2: Map of Khuzhir-Nuge XIV

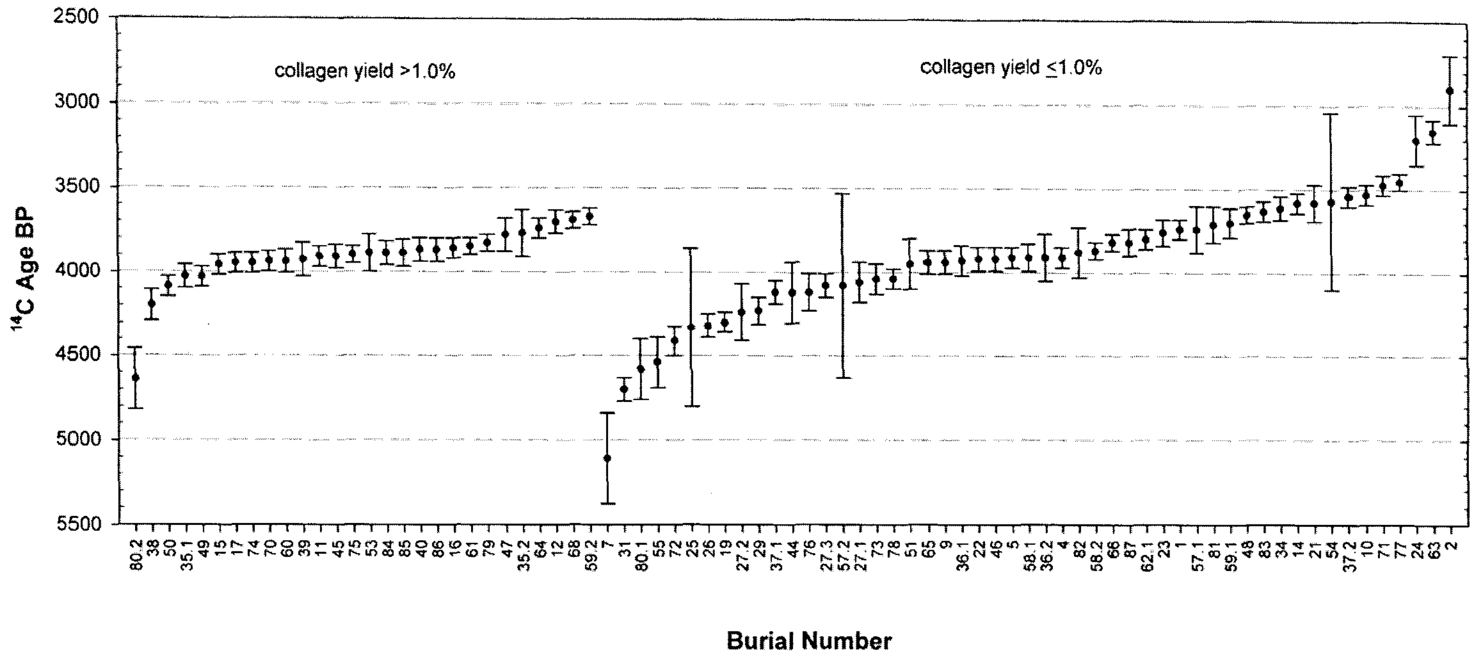

Figure 3.3: Radiocarbon dates at Khuzhir-Nuge XIV sorted by collagen yield (n=79).

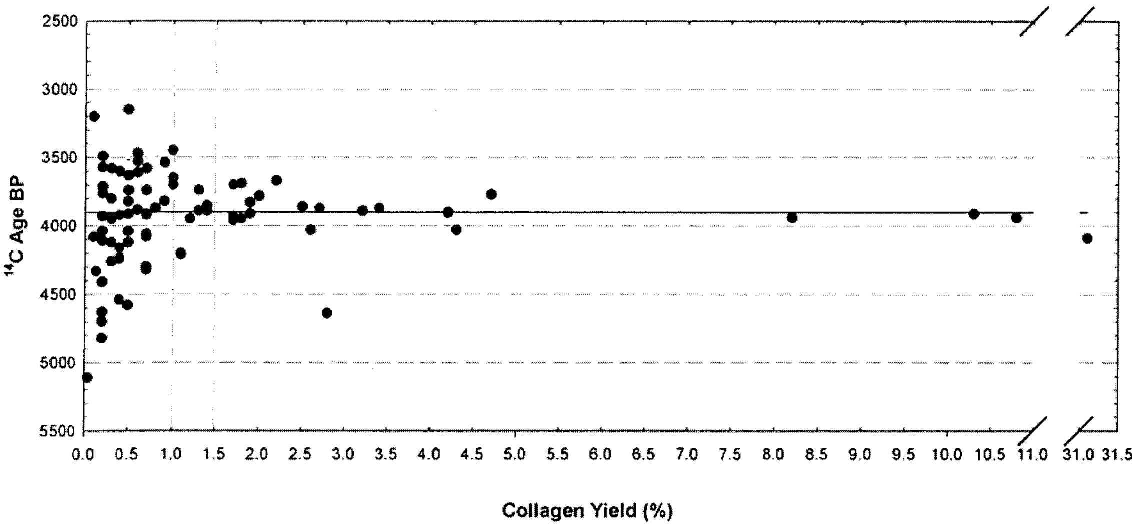

Figure 3.4: Scatterplot of collagen yield (%) vs. radiocarbon years BP at Khuzhir-Nuge XIV (n=87)

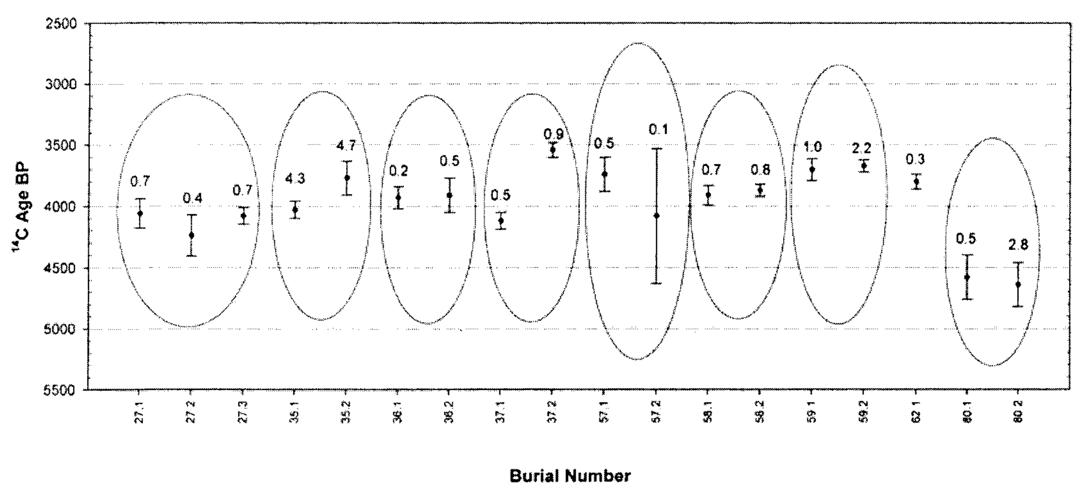

Figure 3.5: Radiocarbon dates and collagen yields for burials from graves with multiple interments at Khuzhir-Nuge XIV

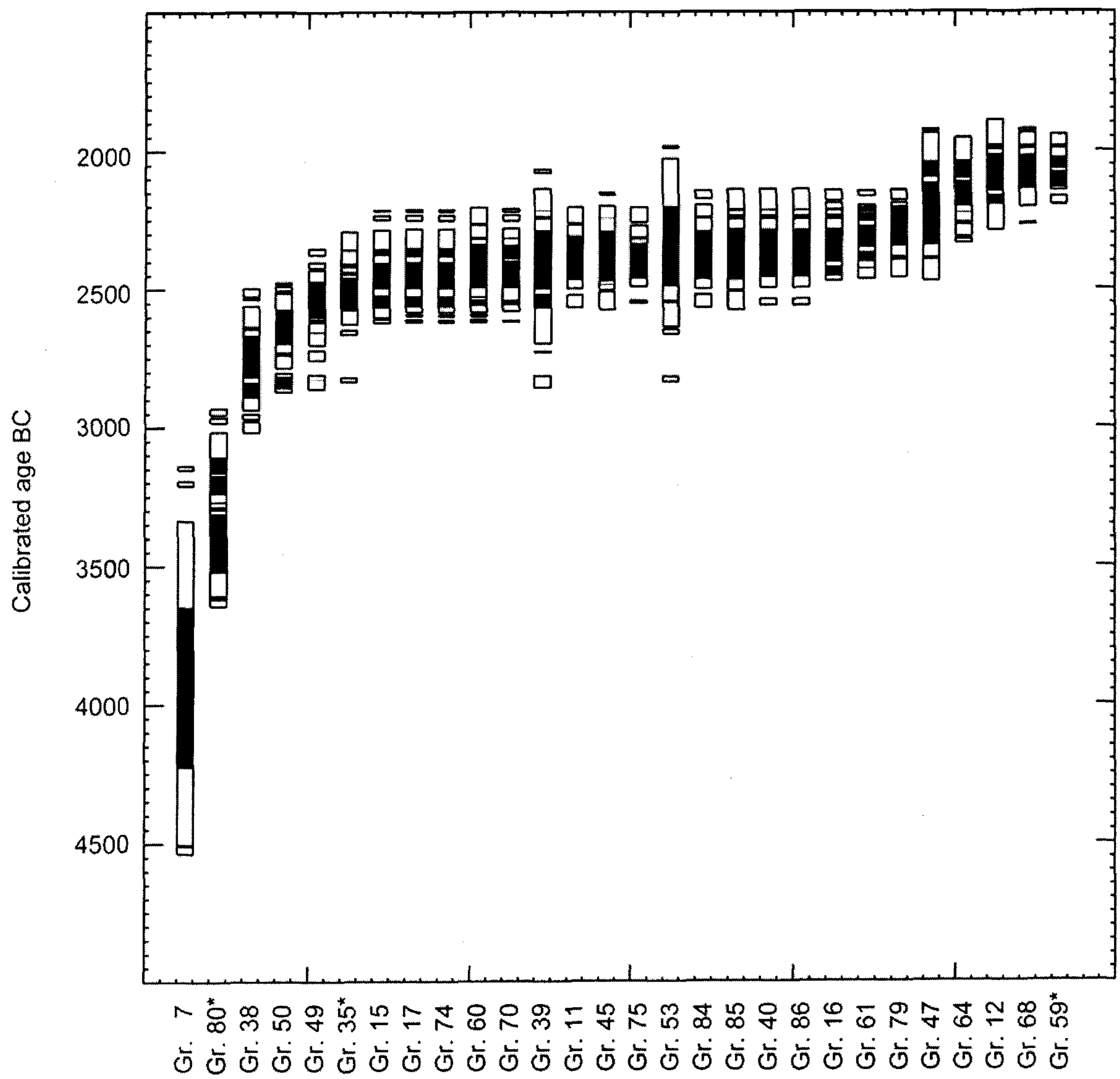

Figure 3.6: Plot of calibrated high-collagen radiocarbon dates for Khuzhir-Nuge XIV (*=combined radiocarbon date)

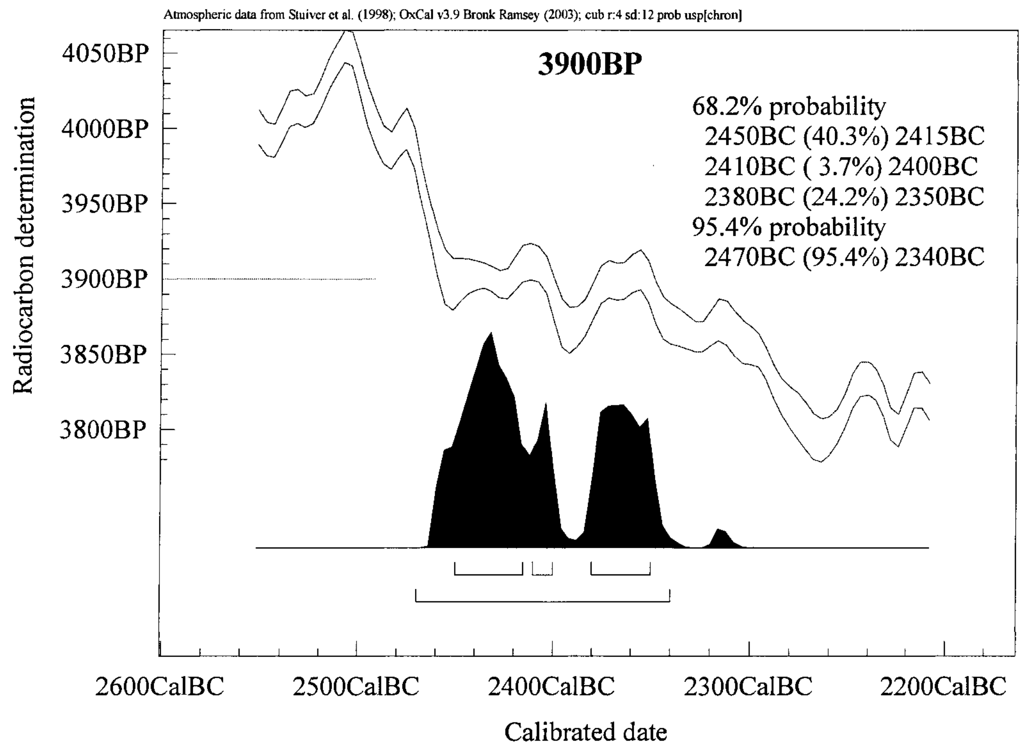

Figure 3.7: Radiocarbon curve at 3900 BP

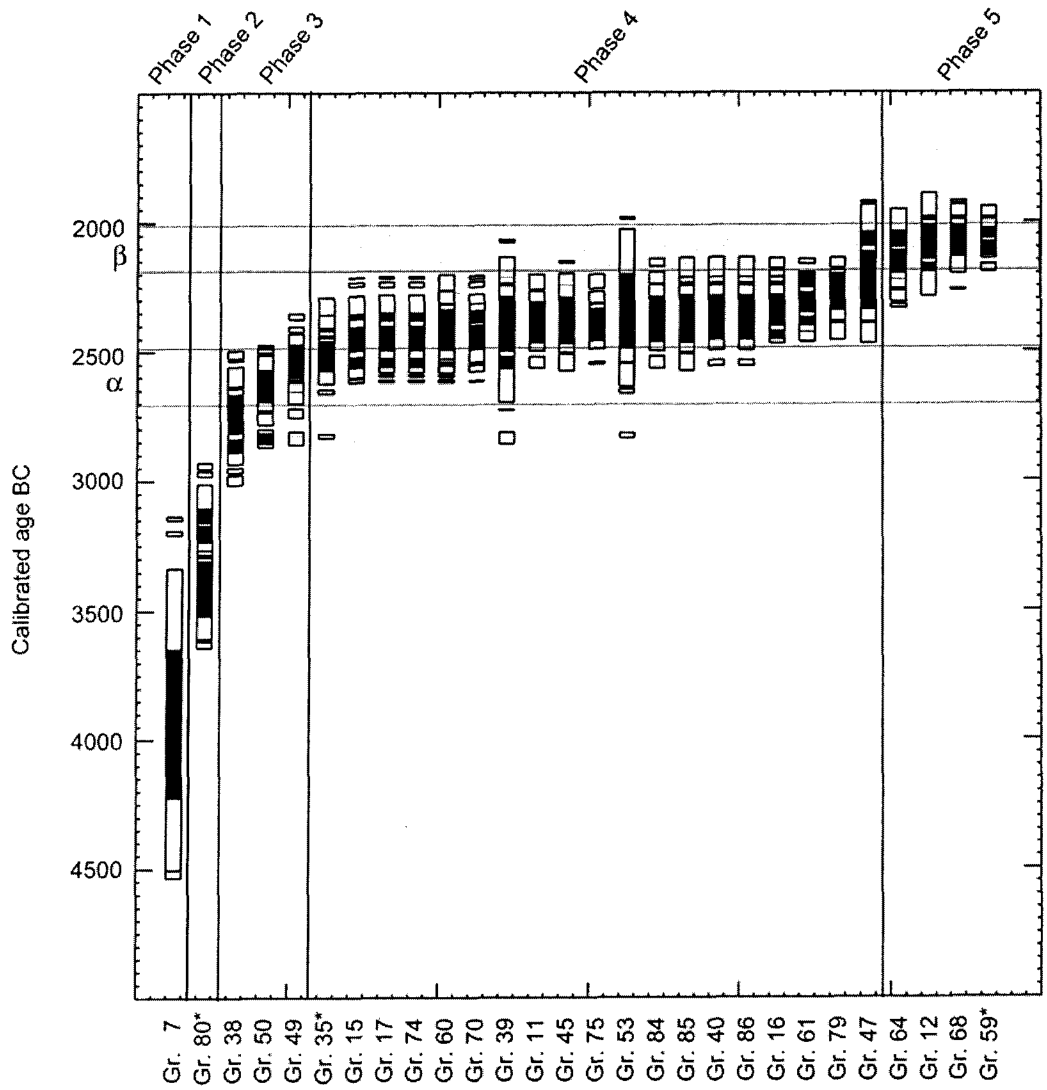

Figure 3.8: Modeled High Posterior Density Regions for the beginning (α) and end (β) of cemetery use when Phase 1 is excluded

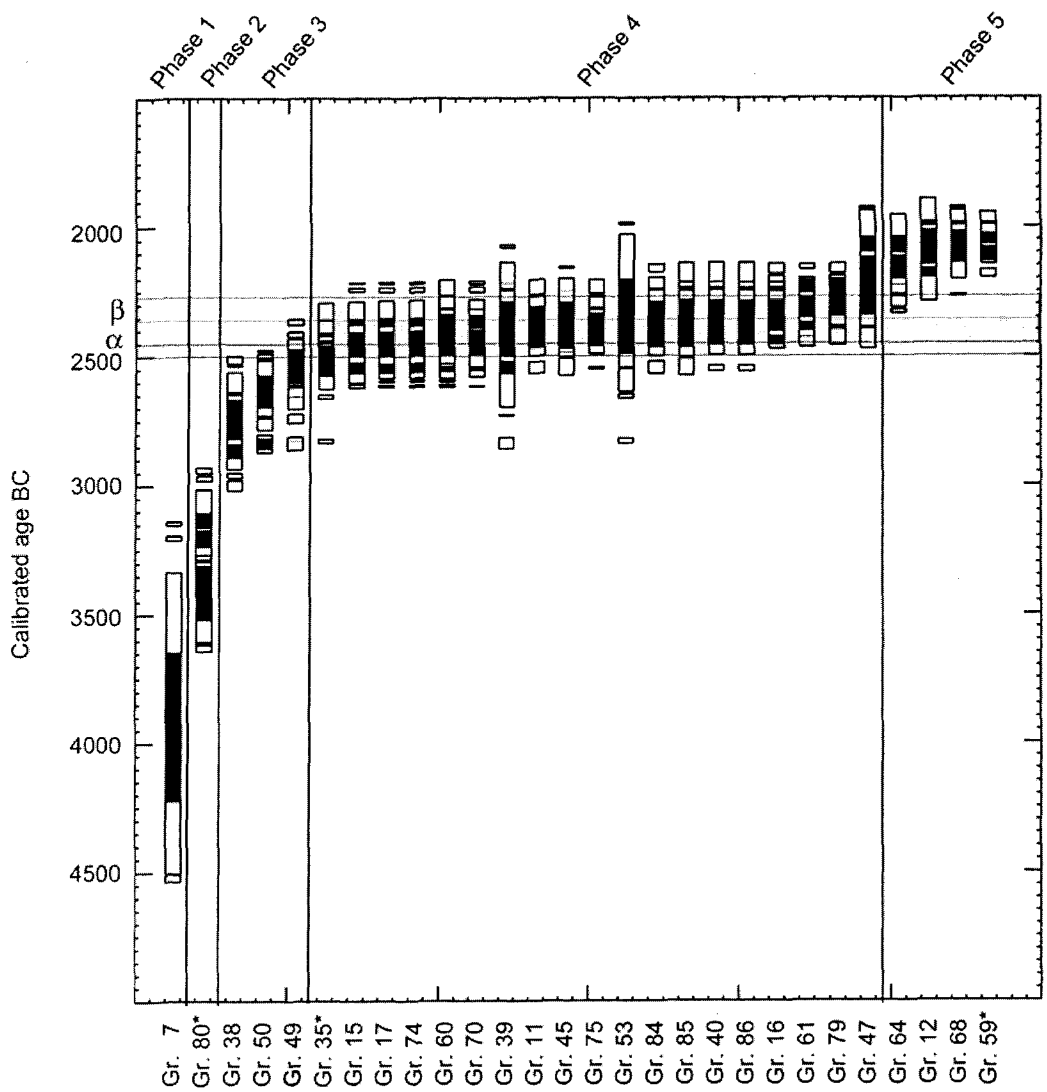

Figure 3.9: Modeled High Posterior Density Regions for the beginning (α) and end (β) of cemetery use during Phase 4

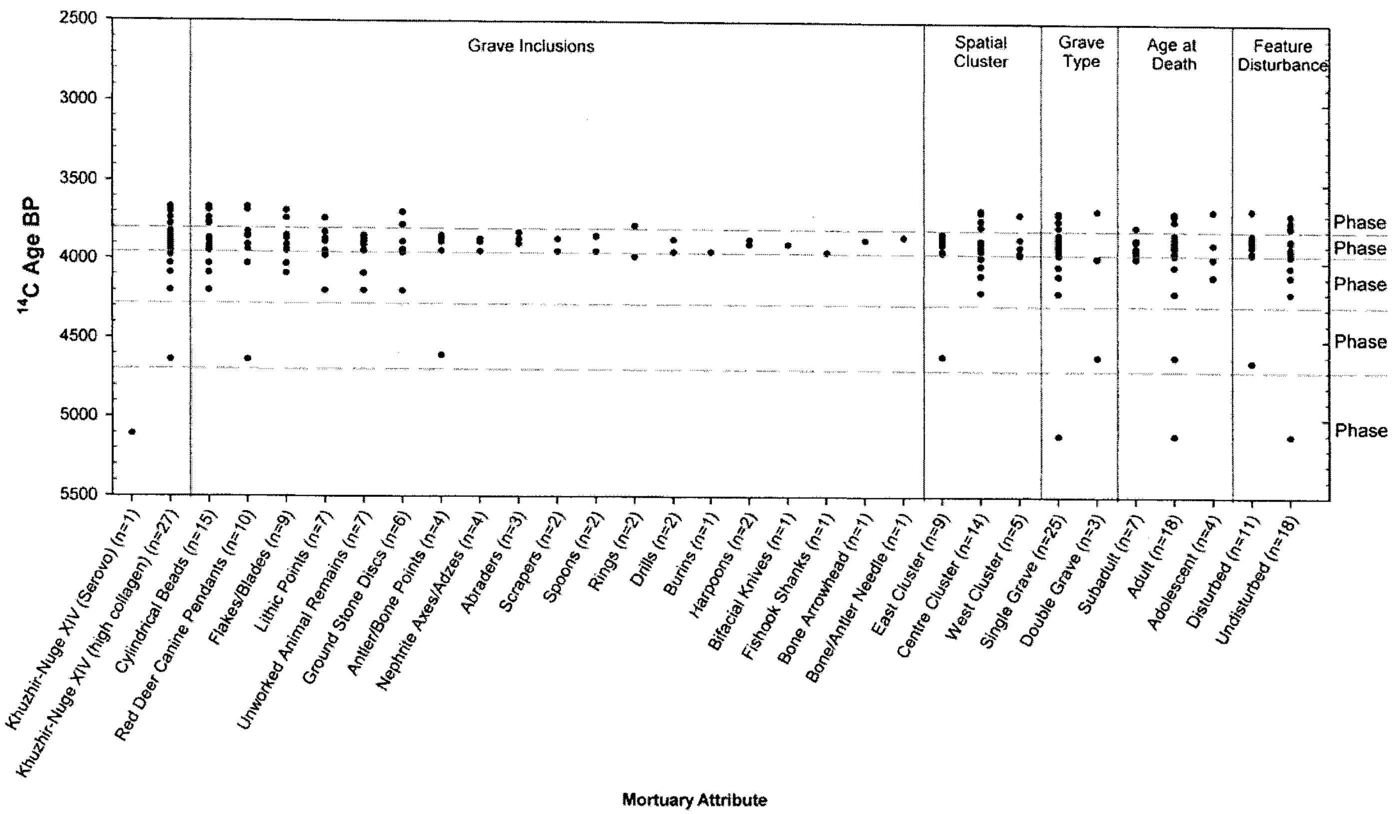

Figure 3.10: Temporal distribution of mortuary attributes at Khuzhir-Nuge XIV

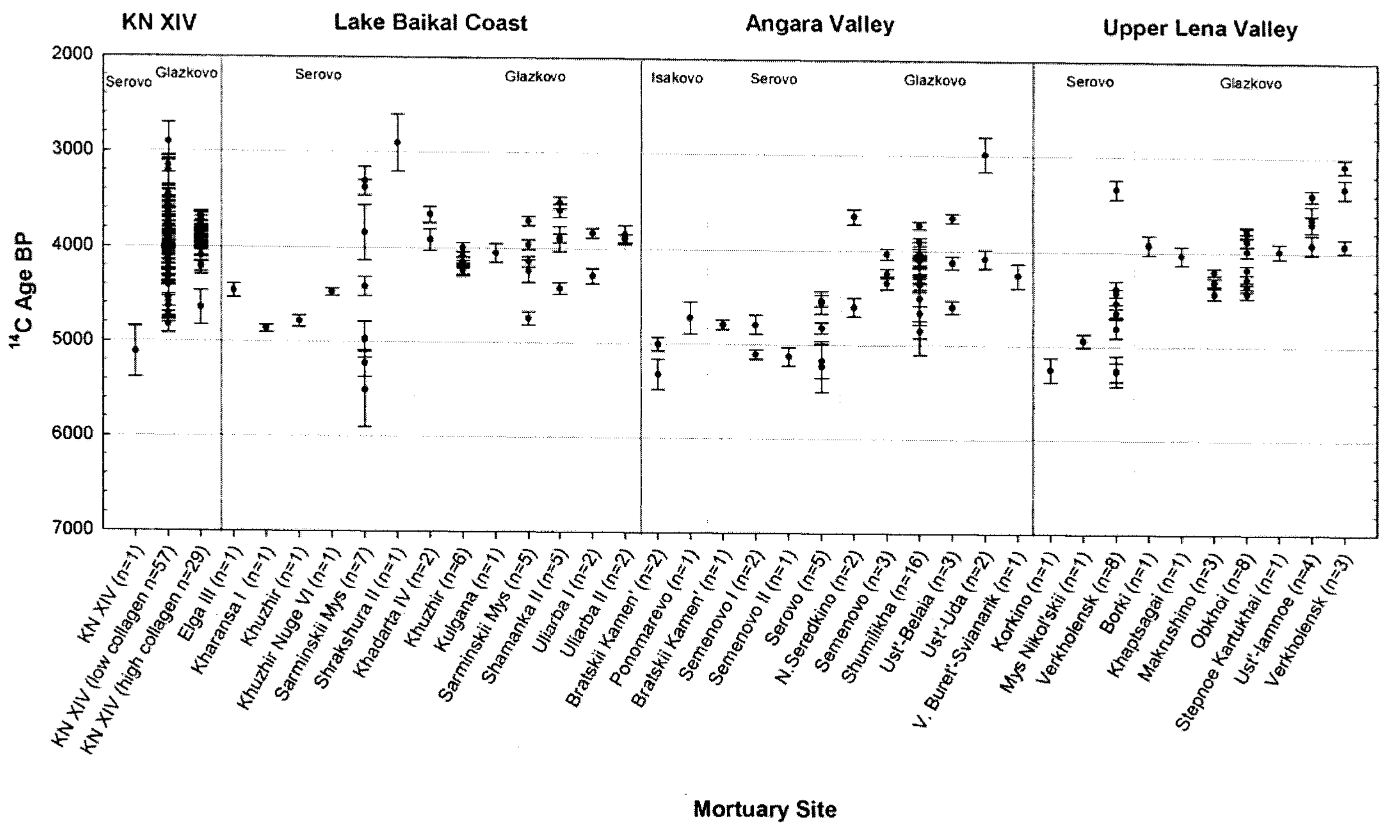

Figure 3.11: Radiocarbon dates for Khuzhir-Nuge XIV and other post-hiatus graves in the Cis-Baikal

Table 3.1: Results of radiocarbon dating for Khuzhir-Nuge XIV

No.	Grave Burial	Culture	Lab Code	Collagen yield %	^{14}C Age BP	s.d.	Calibrated Age BC 68% low	68% high	Probability (%)*	95% low	95% high	Probability (%)*
1	Gr. 01	Glazkovo	TO-10097	0.70	3740	60	2204	2110	55.2	2311	1953	99.2
2	Gr. 02	Glazkovo	GIN-7523	unreported	2900	200	1317	896	92.4	1616	758	97.2
3	Gr. 03	Glazkovo	Insufficient material for radiocarbon dating									
4	Gr. 04	Glazkovo	GIN-7522	unreported	3910	60	2468	2306	100	2498	2268	85.3
5	Gr. 05	Glazkovo	TO-10098	0.70	3910	60	2468	2306	100	2498	2268	85.3
6	Gr. 07	Serovo	TO-06862	0.04	5110	270	4228	3644	100	4504	3336	99.2
7	Gr. 09	Glazkovo	TO-06863	0.30	3940	70	2496	2334	83.3	2583	2266	92.6
8	Gr. 10	Glazkovo	TO-07834	0.60	3530	60	1923	1768	95.5	1982	1733	92.3
9	Gr. 11	Glazkovo	TO-06864	10.30	3910	60	2468	2306	100	2498	2268	85.3
10	Gr. 12	Glazkovo	TO-07835	1.70	3700	70	2149	2012	73.6	2288	1892	100
11	Gr. 14	Glazkovo	TO-06865	0.70	3580	60	1982	1877	69.5	2042	1745	94.7
12	Gr. 15	Glazkovo	TO-06866	1.70	3960	60	2499	2402	58.2	2601	2285	97.7
13	Gr. 16	Glazkovo	TO-07836	2.50	3860	60	2405	2280	67.4	2471	2189	95.3
14	Gr. 17	Glazkovo	TO-08483	1.80	3950	60	2497	2398	60	2583	2281	97.2
15	Gr. 19	Glazkovo	TO-07837	0.70	4300	60	2940	2877	61.5	3096	2857	87.7
16	Gr. 21	Glazkovo	TO-08484	0.30	3580	110	2039	1767	92.4	2206	1679	97.3
17	Gr. 22	Glazkovo	TO-06867	0.70	3920	70	2474	2293	95.2	2578	2200	100
18	Gr. 23	Glazkovo	TO-07838	0.20	3760	80	2291	2112	75.1	2405	1956	97.1
19	Gr. 24	Glazkovo	TO-06868	0.10	3200	150	1640	1299	93.8	1779	1050	97.9
20	Gr. 25	Glazkovo	TO-09375	0.00	no date returned							
21	Gr. 25	Glazkovo	TO-09375R	0.13	4330	470	3537	2402	95.3	4004	1731	99.4
22	Gr. 26	Glazkovo	TO-10101	0.20	3490	120	1961	1681	93.6	2068	1521	96
23	Gr. 26	Glazkovo	TO-11543R	0.70	4320	70	3025	2880	97	3104	2857	86.3
24	Gr. 27-1	Glazkovo	TO-08485	0.70	4060	120	2704	2466	73.6	2898	2287	99.6
25	Gr. 27-2	Glazkovo	TO-09376	0.40	4240	170	3034	2575	95.8	3358	2431	99.2
26	Gr. 27-3	Glazkovo	TO-09377	0.70	4080	70	2697	2559	62.3	2784	2470	81.9
27	Gr. 28	Glazkovo	TO-08486	0.00	no date returned							
28	Gr. 29	Glazkovo	TO-08487	0.40	4230	80	2815	2674	66	3018	2617	96.6
29	Gr. 30	Glazkovo	Insufficient material for radiocarbon dating									
30	Gr. 31	Glazkovo	TO-09378	0.20	4700	70	3468	3373	57.5	3638	3360	100
31	Gr. 32-1	Glazkovo	TO-09379	0.00	no date returned							
32	Gr. 33	Glazkovo	TO-10099	0.08	no date returned							
33	Gr. 34	Glazkovo	TO-09380	0.60	3610	70	2040	1880	87.5	2142	1767	98.6
34	Gr. 35-1	Glazkovo	TO-09381	4.30	4030	70	2630	2464	89.4	2710	2398	82.8
35	Gr. 35-2	Glazkovo	TO-09382	4.70	3770	140	2353	2020	86.6	2503	1865	94.7
36	Gr. 36-1	Glazkovo	TO-09383	0.20	3930	90	2498	2290	85.3	2640	2139	98.2
37	Gr. 36-2	Glazkovo	TO-09384	0.50	3910	140	2577	2197	96.6	2709	2021	93.4
38	Gr. 37-1	Glazkovo	TO-10108	0.50	4120	70	no solution >50%			2880	2557	93.5
39	Gr. 37-1	Glazkovo	TO-11544	0.40	4160	70	2818	2664	75.1	2895	2571	98.6
40	Gr. 37-2	Glazkovo	TO-09386	0.90	3540	60	1944	1857	52.6	2030	1736	97.9
41	Gr. 37-3	Glazkovo	Insufficient material for radiocarbon dating									
42	Gr. 38	Glazkovo	TO-09387	1.10	4200	90	2819	2663	69.5	2934	2559	94.7
43	Gr. 39	Glazkovo	TO-09388	1.70	3930	100	2500	2286	79.8	2697	2136	97.5
44	Gr. 40	Glazkovo	TO-09389	3.40	3870	70	2460	2283	89.6	2495	2138	98.5
45	Gr. 41	Glazkovo	Insufficient material for radiocarbon dating									
46	Gr. 42	Glazkovo	Insufficient material for radiocarbon dating									
47	Gr. 43	Glazkovo	TO-09390	0.00	no date returned							
48	Gr. 44	Glazkovo	TO-09391	0.30	4120	180	2916	2457	99.4	3104	2189	96.9
49	Gr. 45	Glazkovo	TO-09392	0.20	4820	90	3702	3517	96.5	3781	3489	83.1
50	Gr. 45	Glazkovo	TO-11546	1.90	3910	70	2473	2288	98.1	2504	2198	90.5
51	Gr. 46	Glazkovo	TO-09393	0.30	4260	110	3018	2839	52.6	3104	2566	93.8
52	Gr. 46	Glazkovo	TO-09393R	0.40	3920	70	2474	2293	95.2	2578	2200	100
53	Gr. 47	Glazkovo	TO-09394	2.00	3780	100	2344	2115	78.4	2470	1937	99.6
54	Gr. 48	Glazkovo	TO-09429	1.00	3650	50	2043	1943	71.4	2142	1884	98.9
55	Gr. 49	Glazkovo	TO-09395	2.60	4030	60	2603	2468	90.2	2702	2430	86.8
56	Gr. 50	Glazkovo	TO-09396	31.10	4090	60	2698	2569	64.6	2783	2488	79.7
57	Gr. 51	Glazkovo	TO-09397	0.30	3950	150	2624	2201	96.8	2878	2115	96.8
58	Gr. 52	Glazkovo	TO-09398	0.00	no date returned							
59	Gr. 53	Glazkovo	TO-09399	3.20	3890	110	2492	2199	97.2	2637	2029	98.5
60	Gr. 54	Glazkovo	TO-09400	0.20	3570	530	2624	1290	97.9	3373	760	99.2
61	Gr. 55	Glazkovo	TO-09401	0.40	4540	150	3378	3077	76.3	3541	2900	94.5
62	Gr. 57-1	Glazkovo	TO-09402	0.50	3740	140	2314	1948	93.6	2495	1767	98.9
63	Gr. 57-2	Glazkovo	TO-09403	0.10	4080	550	3355	1938	99.8	3966	1260	99.9
64	Gr. 58-1	Glazkovo	TO-09404	0.70	3910	80	2474	2285	89.9	2581	2189	96.9
65	Gr. 58-2	Glazkovo	TO-09405	0.80	3870	50	2410	2288	76.8	2468	2200	100
66	Gr. 59-1	Glazkovo	TO-09406	1.00	3700	90	2202	1948	100	2351	1877	97.2
67	Gr. 59-2	Glazkovo	TO-09407	2.20	3670	50	no solution >50%			2148	1912	93.6
68	Gr. 60	Glazkovo	TO-09408	1.10	4210	50	2813	2737	56.1	2822	2660	68.7
69	Gr. 60	Glazkovo	TO-11547R	8.20	3940	70	2496	2334	83.3	2583	2266	92.6
70	Gr. 61	Glazkovo	TO-09409	1.40	3850	50	no solution >50%			2464	2197	97.2
71	Gr. 62-1	Glazkovo	TO-09410	0.00	no date returned							
72	Gr. 62-1	Glazkovo	TO-09410R	0.30	3800	60	2312	2139	93.9	2411	2122	87.3
73	Gr. 62-2	Glazkovo	TO-09411	0.00	no date returned							
74	Gr. 63	Glazkovo	TO-09412	0.50	3150	70	1514	1375	91	1535	1257	95.2
75	Gr. 63	Glazkovo	TO-11540R	0.40	3600	70	2038	1878	87.7	2139	1766	98.8
76	Gr. 64	Glazkovo	TO-09413	0.20	4110	110	2764	2570	66.7	2915	2401	98.8
77	Gr. 64	Glazkovo	TO-11545R	1.30	3740	60	2204	2110	55.2	2311	1953	99.2
78	Gr. 65	Glazkovo	TO-09414	0.20	4630	110	3534	3329	69.5	3642	3083	97.8
79	Gr. 65	Glazkovo	TO-11548R	0.30	3940	70	2496	2334	83.3	2583	2266	92.6
80	Gr. 66	Glazkovo	TO-09415	0.90	3820	50	2341	2198	89	2458	2139	100

Table 3.1 (continued): Results of radiocarbon dating for Khuzhir-Nuge XIV

No.	Grave Burial	Culture	Lab Code	Collagen yield %	^{14}C Age BP	s.d.	Calibrated Age BC 68% low	68% high	Probability (%)*	95% low	95% high	Probability (%)*
81	Gr. 68	Glazkovo	TO-09416	1.80	3690	50	2141	2015	89.7	2203	1936	98.8
82	Gr. 70	Glazkovo	TO-09417	10.80	3940	60	2495	2395	60.6	2579	2279	96.8
83	Gr. 71	Glazkovo	TO-09418	0.60	3470	60	1829	1737	61.1	1939	1678	95.1
84	Gr. 72	Glazkovo	TO-09419	0.20	4410	90	3103	2915	73.4	3346	2892	100
85	Gr. 73	Glazkovo	TO-09420	0.50	4040	90	2684	2464	85	2877	2396	95.8
86	Gr. 74	Glazkovo	TO-09421	1.20	3950	60	2497	2398	60	2583	2281	97.2
87	Gr. 75	Glazkovo	TO-09422	4.20	3900	50	2463	2332	93.1	2491	2270	91.2
88	Gr. 76	Glazkovo	TO-09423	0.30	4120	110	2784	2576	73.1	2918	2402	99.1
89	Gr. 77	Glazkovo	TO-09424	1.00	3450	50		no solution >50%		1885	1677	93
90	Gr. 78	Glazkovo	TO-09425	0.20	4040	60	2623	2470	94.1	2709	2455	84.3
91	Gr. 79	Glazkovo	TO-09426	1.90	3830	50	2347	2199	91.1	2459	2189	91.8
92	Gr. 80-1	Glazkovo	TO-09427	0.50	4580	180	3521	3084	92.5	3711	2875	99.9
93	Gr. 80-2	Glazkovo	TO-09428	2.80	4640	180	3543	3306	54.2	3714	2902	98.6
94	Gr. 81	Glazkovo	TO-10107	0.20	3710	110	2211	1943	87.8	2459	1876	97.6
95	Gr. 82	Glazkovo	TO-10103	0.60	3880	150	2501	2137	89.3	2704	1939	95.6
96	Gr. 83	Glazkovo	TO-10100	0.50	3630	60	2040	1912	81.2	2143	1876	93.9
97	Gr. 84	Glazkovo	TO-10104	1.40	3890	70	2466	2287	96.1	2499	2195	92.8
98	Gr. 85	Glazkovo	TO-10102	1.30	3890	80	2469	2281	89.5	2504	2139	93
99	Gr. 86	Glazkovo	TO-10105	2.70	3870	70	2460	2283	89.6	2495	2138	98.5
100	Gr. 87	Glazkovo	TO-10106	0.50	3820	80	2353	2141	88.4	2470	2032	100

Notes:
All dates are AMS except the two conventional dates for Graves 2 and 4.
Eight features (No. 6, 8, 13, 18, 20, 56, 67, and 69) are not graves and are excluded from the data set.
Only solutions with probabilities greater than 50% are presented
R indicates a repeated analysis

Table 3.2: Post-hiatus radiocarbon dates for the Cis-Baikal

No.	Lab Code	Site	Source	Culture	Collagen yield (%)	^{14}C Age BP	s.d.	References
Angara								
1	GIN-4480	Bratskii Kamen'	Grave 18-2	Serovo	unreported	4790	50	Mamonova & Sulerzhitskii 1989
2	GIN-4044	Bratskii Kamen'	Grave 20	Isakovo	unreported	5320	160	Mamonova & Sulerzhitskii 1989
3	GIN-4045	Bratskii Kamen'	Grave 21	Isakovo	unreported	5000	70	Mamonova & Sulerzhitskii 1989
4	GIN-3885	N. Seredkino	Grave 02	Glazkovo	unreported	4600	100	Mamonova & Sulerzhitskii 1989
5	GIN-4049	N. Seredkino	Ostrov (1957)	Glazkovo	unreported	3640	80	Mamonova & Sulerzhitskii 1989
6	GIN-4797	Ponomarevo	Grave 10	Isakovo	unreported	4720	170	Mamonova pers. comm.
7	GIN-3877	Semenovo	Grave 02	Glazkovo	unreported	4240	50	Mamonova & Sulerzhitskii 1989
8	GIN-4053	Semenovo	Grave 05	Glazkovo	unreported	4340	70	Mamonova & Sulerzhitskii 1989
9	GIN-4054	Semenovo	Grave 07-2	Glazkovo	unreported	4030	60	Mamonova & Sulerzhitskii 1989
10	GIN-4052	Semenovo I	Grave 11	Serovo	unreported	4790	100	Mamonova & Sulerzhitskii 1989
11	GIN-3879	Semenovo I	Grave 12	Serovo	unreported	5100	50	Mamonova & Sulerzhitskii 1989
12	GIN-3880	Semenovo II	Grave 01	Serovo	unreported	5120	100	Mamonova & Sulerzhitskii 1989
13	SOAN 0808	Serovo	Village burial	Serovo	unreported	5230	270	Mamonova & Sulerzhitskii 1989
14	GIN-3874	Serovo	Grave 10	Serovo	unreported	4820	60	Mamonova & Sulerzhitskii 1989
15	GIN-4467	Serovo	Grave 11	Serovo	unreported	5170	180	Mamonova & Sulerzhitskii 1989
16	GIN-3875	Serovo	Grave 12	Serovo	unreported	4530	60	Mamonova & Sulerzhitskii 1989
17	GIN-4811	Serovo	Grave 17	Serovo	unreported	4550	120	Mamonova pers. comm.
18	GIN-4125	Shumilikha	Grave 01	Glazkovo	unreported	3900	40	Mamonova & Sulerzhitskii 1989
19	GIN-4518	Shumilikha	Grave 05	Glazkovo	unreported	3730	40	Mamonova & Sulerzhitskii 1989
20	GIN-4516	Shumilikha	Grave 09	Glazkovo	unreported	4030	30	Mamonova & Sulerzhitskii 1989
21	GIN-4064	Shumilikha	Grave 10	Glazkovo	unreported	4850	70	Mamonova & Sulerzhitskii 1989
22	GIN-4069	Shumilikha	Grave 12	Glazkovo	unreported	4360	70	Mamonova & Sulerzhitskii 1989
23	GIN-4514	Shumilikha	Grave 18	Glazkovo	unreported	4020	50	Mamonova & Sulerzhitskii 1989
24	GIN-4520	Shumilikha	Grave 23	Glazkovo	unreported	4100	70	Mamonova & Sulerzhitskii 1989
25	GIN-4521	Shumilikha	Grave 24	Glazkovo	unreported	4060	120	Mamonova & Sulerzhitskii 1989
26	GIN-4515	Shumilikha	Grave 29	Glazkovo	unreported	4040	40	Mamonova & Sulerzhitskii 1989
27	GIN-4068	Shumilikha	Grave 32-2	Glazkovo	unreported	4660	80	Mamonova & Sulerzhitskii 1989
28	GIN-4065	Shumilikha	Grave 37	Glazkovo	unreported	4100	50	Mamonova & Sulerzhitskii 1989
29	GIN-3332	Shumilikha	Grave 40	Glazkovo	unreported	4500	600	Mamonova & Sulerzhitskii 1989
30	GIN-3884	Shumilikha	Grave 40	Glazkovo	unreported	4260	90	Mamonova & Sulerzhitskii 1989
31	GIN-4523	Shumilikha	Grave 42	Glazkovo	unreported	4290	40	Mamonova & Sulerzhitskii 1989
32	GIN-4517	Shumilikha	?	Glazkovo	unreported	4340	70	Mamonova & Sulerzhitskii 1989
33	GIN-4519	Shumilikha	?	Glazkovo	unreported	4170	70	Mamonova & Sulerzhitskii 1989
34	GIN-4047	Ust'-Belaia	Grave 01 (1953)	Glazkovo	unreported	4590	70	Mamonova & Sulerzhitskii 1989
35	GIN-4799	Ust'-Belaia	Grave 02 (1957)	Glazkovo	unreported	3650	50	Mamonova & Sulerzhitskii 1989
36	GIN-4798	Ust'-Belaia	Trench 3 Grave 2	Glazkovo	unreported	4120	70	Mamonova & Sulerzhitskii 1989
37	GIN-3881	Ust'-Uda	Grave 02	Glazkovo	unreported	4080	100	Mamonova & Sulerzhitskii 1989
38	GIN-4796	Ust'-Uda	Grave 02-a	Glazkovo	unreported	2980	180	Mamonova pers. comm.
39	GIN-4370	V. Buret'-Svinarnik		Glazkovo	unreported	4260	130	Mamonova & Sulerzhitskii 1989
Lake Baikal								
40	GIN-6841	Elga III	Grave 05	Serovo	unreported	4460	70	Goriunova 1997
41	SOAN-3349	Khadarta IV	Grave 01	Glazkovo	unreported	3910	110	Kharinskii & Sosnovskaia 2000
42	SOAN-3348	Khadarta IV	Grave 13	Glazkovo	unreported	3645	85	Kharinskii & Sosnovskaia 2000
43	GIN-3873	Kharansa I	Grave 29	Serovo	unreported	4860	40	Mamonova & Sulerzhitskii 1989
44	TO-10979	Khuzhir	Grave 02 (1972)	Glazkovo	5.90	4150	60	
45	TO-10980	Khuzhir	Grave 01 (1972)	Glazkovo	10.40	4220	60	
46	TO-10983	Khuzhir	Grave 01 (1973)	Glazkovo	6.10	4240	60	
47	TO-10984	Khuzhir	Grave 02 (1793)	Glazkovo	1.30	3990	50	
48	TO-10986	Khuzhir	Grave 03 (1973)	Glazkovo	4.90	4080	50	
49	TO-10987	Khuzhir	Grave 04 (1973)	Glazkovo	0.80	4150	50	
50	TO-10988	Khuzhir	Grave 01 (1976)	Serovo	1.70	4780	60	
51	GIN-5607	Khuzhir Nuge VI	Grave 04	Serovo	unreported	4470	40	Goriunova 1997
52	GIN-4094	Kulgana	Grave 01(1977)	Glazkovo	unreported	4050	100	Mamonova & Sulerzhitskii 1989
53	GIN-6844	Sarminskii Mys	Grave 10	Glazkovo	unreported	3710	50	Goriunova 2002
54	GIN-6842	Sarminskii Mys	Grave 11A	Serovo	unreported	3300	150	Goriunova 1997
55	GIN-5599	Sarminskii Mys	Grave 11B	Serovo	unreported	5500	400	Goriunova 1997
56	GIN-5605	Sarminskii Mys	Grave 12	Glazkovo	unreported	3960	50	Goriunova 2002
57	SOAN-3765	Sarminskii Mys	Grave 13	Glazkovo	unreported	4740	70	Goriunova 2002
58	GIN-5600	Sarminskii Mys	Grave 19	Serovo	unreported	4410	100	Goriunova 1997
59	SOAN-3766	Sarminskii Mys	Grave 21	Glazkovo	unreported	4140	55	Goriunova 2002
60	SOAN-3764	Sarminskii Mys	Grave 22	Serovo	unreported	4970	190	Goriunova 1997
61	GIN-6843	Sarminskii Mys	Grave 29	Serovo	unreported	5220	140	Goriunova 1997
62	GIN-5602	Sarminskii Mys	Grave 29	Serovo	unreported	3840	290	Goriunova 1997
63	SOAN-3767	Sarminskii Mys	Grave 33	Glazkovo	unreported	4240	120	Goriunova 2002
64	GIN-5839	Sarminskii Mys	Grave 08	Serovo	unreported	3370	80	Goriunova 1997
65	SOAN-3895	Shamanka II	Grave 02	Glazkovo	unreported	3900	130	Vasil'evskii 1978
66	SOAN-5165	Shamanka II	Grave 03	Glazkovo	unreported	3890	45	Vasil'evskii 1978
67	GIN-11229	Shamanka II	Grave 05	Glazkovo	unreported	3600	70	Vasil'evskii 1978
68	GIN-11230	Shamanka II	Grave 09	Glazkovo	unreported	3520	60	Vasil'evskii 1978
69	GIN-5606	Shrakshura II	Grave 02	Serovo	unreported	2900	300	Goriunova 1997
70	SOAN-3347	Sokhter IX		Glazkovo	unreported	4425	60	Kharinskii & Sosnovskaia 2000
71	GIN-4483	Uliarba I	Grave 03	Glazkovo	unreported	3840	50	Mamonova & Sulerzhitskii 1989
72	GIN-4484	Uliarba I	Grave 16	Glazkovo	unreported	4290	80	Mamonova & Sulerzhitskii 1989
73	GIN-4481	Uliarba II	Grave 03	Glazkovo	unreported	3850	100	Mamonova & Sulerzhitskii 1989
74	GIN-4475	Uliarba II	Grave 13-1	Glazkovo	unreported	3890	40	Mamonova & Sulerzhitskii 1989

Table 3.2 (continued): Post-hiatus radiocarbon dates for the Cis-Baikal

No.	Lab Code	Site	Source	Culture	Collagen yield (%)	^{14}C Age BP	s.d.	References
Upper Lena								
75	GIN-4104	Borki	Grave 01 (1971)	Glazkovo	unreported	3920	100	Mamonova & Sulerzhitskii 1989
76	GIN-4369	Khaptsagai	Grave 01 (1983)	Glazkovo	unreported	4030	100	Mamonova & Sulerzhitskii 1989
77	GIN-4367	Korkino	Grave 01-2 (1983)	Serovo	unreported	5250	130	Mamonova & Sulerzhitskii 1989
78	TO-04819	Makrushino	Grave 03	Glazkovo	2.30	4430	60	
79	GIN-7766	Makrushino	Grave 13	Glazkovo	unreported	4200	40	Vetrov et al. 1995
80	GIN-7767	Makrushino	Grave 14	Glazkovo	unreported	4310	40	Vetrov et al. 1995
81	GIN-4371	Mys Nikol'skii	Grave 02-1 (1982)	Serovo	unreported	4940	70	Mamonova & Sulerzhitskii 1989
82	GIN-4096	Obkhoi	Grave 01 (1976)	Glazkovo	unreported	3790	50	Mamonova & Sulerzhitskii 1989
83	GIN-4123	Obkhoi	Grave 01-2 (1971)	Glazkovo	unreported	4430	50	Mamonova & Sulerzhitskii 1989
84	GIN-4103	Obkhoi	Grave 03 (1971)	Glazkovo	unreported	3880	50	Mamonova & Sulerzhitskii 1989
85	GIN-4120	Obkhoi	Grave 03 (1973)	Glazkovo	unreported	4280	50	Mamonova & Sulerzhitskii 1989
86	GIN-4106	Obkhoi	Grave 04 (1971)	Glazkovo	unreported	3760	40	Mamonova & Sulerzhitskii 1989
87	GIN-4101	Obkhoi	Grave 04 (1971)	Glazkovo	unreported	3980	60	Mamonova & Sulerzhitskii 1989
88	GIN-4121	Obkhoi	Grave 07 (1971)	Glazkovo	unreported	4180	50	Mamonova & Sulerzhitskii 1989
89	GIN-4122	Obkhoi	Grave 13 (1971)	Glazkovo	unreported	4360	50	Mamonova & Sulerzhitskii 1989
90	GIN-4124	Stepnoe Kartukhai (1973)		Glazkovo	unreported	3980	80	Mamonova & Sulerzhitskii 1989
91	GIN-3882	Ust'-Iamnoe	Grave 02 (1977)	Glazkovo	unreported	3640	140	Mamonova & Sulerzhitskii 1989
92	GIN-4555	Ust'-Iamnoe	Grave 03 (1978)	Glazkovo	unreported	3690	90	Mamonova & Sulerzhitskii 1989
93	GIN-4556	Ust'-Iamnoe	Grave 04 (1978)	Glazkovo	unreported	3390	60	Mamonova & Sulerzhitskii 1989
94	GIN-4368	Ust'-Iamnoe	Grave 06 (1982)	Glazkovo	unreported	3910	100	Mamonova & Sulerzhitskii 1989
95	GIN-4445	Verkholensk	Grave 11	Serovo	unreported	4650	50	Mamonova & Sulerzhitskii 1989
96	GIN-4444	Verkholensk	Grave 14	Serovo	unreported	4390	80	Mamonova & Sulerzhitskii 1989
97	GIN-4807	Verkholensk	Grave 18	Serovo	unreported	5260	160	Mamonova pers. comm.
98	GIN-4804	Verkholensk	Grave 20	Glazkovo	unreported	3320	100	Mamonova pers. comm.
99	GIN-4801	Verkholensk	Grave 22	Glazkovo	unreported	3080	70	Mamonova pers. comm.
100	GIN-4806	Verkholensk	Grave 24-2	Glazkovo	unreported	3920	70	Mamonova pers. comm.
101	GIN-4814	Verkholensk	Grave 30-1	Serovo	unreported	5270	100	Mamonova pers. comm.
102	GIN-4441	Verkholensk	Grave 30-2	Serovo	unreported	3340	100	Mamonova & Sulerzhitskii 1989
103	GIN-4460	Verkholensk	Grave 30-3	Serovo	unreported	4810	100	Mamonova & Sulerzhitskii 1989
104	GIN-4812	Verkholensk	Grave 32-2 (b)	Serovo	unreported	4430	120	Mamonova pers. comm.
105	GIN-4820	Verkholensk	Grave 37	Serovo	unreported	4540	150	Mamonova pers. comm.

Notes:
All dates were done on samples of human bone tissue.

Table 3.3: Repeat radiocarbon determinations at Khuzhir-Nuge XIV

Grave Burial	Lab Code	^{14}C Age BP	s.d.	Collagen Yield (%)	Test Statistic T*
26	TO-10101	3490	120	0.2	35.69
	TO-11543	4320	70	0.7	Statistically different
37.1	TO-10108	4120	70	0.5	0.16
	TO-11544	4160	70	0.4	Not Statistically different
45	TO-09392	4820	90	0.2	63.7
	TO-11546	3910	70	1.9	Statistically different
46	TO-09393	4260	110	0.3	6.8
	TO-9393R	3920	70	0.4	Statistically different
60	TO-09408	4210	50	1.1	9.85
	TO-11547	3940	70	8.2	Statistically different
63	TO-09412	3150	70	0.5	20.66
	TO-11540	3600	70	0.4	Statistically different
64	TO-09413	4110	110	0.2	8.72
	TO-11545	3740	60	1.3	Statistically different
65	TO-09414	4630	110	0.2	28.01
	TO-11548	3940	70	0.3	Statistically different

Notes:
*Case I T statistic (Ward and Wilson 1978), which has a chi-square distribution with n-1 degrees of freedom; alpha=0.05. Calculated with Calib 4.4 (Struiver and Reimer 1993).

Table 3.4: Combination and calibration of dates at Khuzhir-Nuge XIV

Grave Burial	Individual Dates				Combined Dates			Calibrated Combined Age BC	
	Lab Code	Coll. y	^{14}C Age BP	s.d.	Test Statistic T*	^{14}C Age BP	s.d	1s.d.**	2 s.d.**
35.1	TO-09381	4.30	4030	70	2.76	3980	60	2580 - 2400 (65.2%)	2700 - 2200 (94.1%)
35.2	TO-09382	4.70	3770	140	Not Statistically different				
59.1	TO-09406	1.00	3700	90	0.08	3680	40	2140 - 2010 (58.9%)	2150 - 1920 (89.7%)
59.2	TO-09407	2.20	3670	50	Not statistically different				
80.1	TO-09427	0.50	4580	180	0.06	4610	130	3550 - 3100 (65.4%)	3650 - 2900 (95.4%)
80.2	TO-09428	2.80	4640	180	Not statistically different				

Notes:
*Case I T statistic (Ward and Wilson 1978), which has a chi-square distribution with n-1 degrees of freedom; alpha=0.05.
Calculated with Calib 4.4 (Struiver and Reimer 1993).
** Only solutions with probabilities greater than 50% are presented

Table 3.5: Outlier analysis of Khuzhir-Nuge XIV radiocarbon dates using a single prior probability of 0.1 (outliers identified in each run are bolded)

No.	Grave	Lab Code	^{14}C Age BP	s.d.	Run 1	Run 2	Run 3	Run 4	Run 5	Phase
1	Gr. 59-COMB	TO-09406,TO-09407	3680	40	**0.16**	-	-	-	-	
2	Gr. 68	TO-09416	3690	50	0.13	**0.17**	-	-	-	
3	Gr. 12	TO-07835	3700	70	0.11	0.13	**0.14**	-	-	5
4	Gr. 64	TO-11545R	3740	60	0.09	0.09	0.12	**0.17**	-	
5	Gr. 47	TO-09394	3780	100	0.06	0.06	0.06	0.06	0.07	
6	Gr. 79	TO-09426	3830	50	0.07	0.07	0.06	0.06	0.07	
7	Gr. 61	TO-09409	3850	50	0.07	0.06	0.06	0.06	0.06	
8	Gr. 16	TO-07836	3860	60	0.07	0.06	0.06	0.06	0.05	
9	Gr. 86	TO-10105	3870	70	0.07	0.06	0.05	0.05	0.05	
10	Gr. 40	TO-09389	3870	70	0.07	0.06	0.06	0.05	0.05	
11	Gr. 85	TO-10102	3890	80	0.06	0.06	0.06	0.05	0.04	
12	Gr. 84	TO-10104	3890	70	0.07	0.06	0.06	0.06	0.05	
13	Gr. 53	TO-09399	3890	110	0.06	0.05	0.05	0.05	0.04	
14	Gr. 75	TO-09422	3900	50	0.08	0.07	0.07	0.07	0.05	4
15	Gr. 45	TO-11546	3910	70	0.07	0.06	0.06	0.06	0.05	
16	Gr. 11	TO-06864	3910	60	0.07	0.07	0.07	0.07	0.05	
17	Gr. 39	TO-09388	3930	100	0.06	0.06	0.06	0.06	0.05	
18	Gr. 70	TO-09417	3940	60	0.08	0.08	0.08	0.08	0.06	
19	Gr. 60	TO-11547R	3940	70	0.08	0.07	0.07	0.07	0.05	
20	Gr. 74	TO-09421	3950	60	0.09	0.08	0.09	0.09	0.07	
21	Gr. 17	TO-08483	3950	60	0.09	0.08	0.08	0.09	0.06	
22	Gr. 15	TO-06866	3960	60	0.09	0.09	0.09	0.10	0.07	
23	Gr. 35-COMB	TO-09381,TO-09382	3980	60	0.09	0.09	0.11	0.12	0.10	
24	Gr. 49	TO-09395	4030	60	0.10	0.12	**0.18**	-	-	
25	Gr. 50	TO-09396	4090	60	0.13	**0.19**	-	-	-	3
26	Gr. 38	TO-09387	4200	90	**0.29**	-	-	-	-	
27	Gr. 80-COMB	TO-09427,TO-09428	4610	130	**0.98**	-	-	-	-	2
28	Gr. 7	TO-06862	5110	270	-	-	-	-	-	1

Note: Grave 7 as an obvious outlier on both archeological and radiocarbon grounds was not included in the runs; however, it is presented in the table in order to identify the earliest phase of cemetery use.

Chapter 4[1]
Mortuary Variability at Khuzhir-Nuge XIV

In Chapter 3, I described temporal patterns of cemetery use at the Late Neolithic–Bronze Age cemetery Khuzhir-Nuge XIV (KN XIV), and I demonstrated that it is necessary to treat the Glazkovo component of the cemetery as a single analytic unit lasting between ~340–660 years, centered around 2400 BC. Furthermore, I suggested that the restricted duration of use, the unimodal nature of the temporal distribution, and the lack of major chronological changes or discontinuities in mortuary attributes (Figure 3.10) together imply the operation of enduring local practices repeated over multiple generations. In the current chapter, I build on these observations by documenting the nature of these local practices through an analysis of the structure of mortuary variability at the site. Following Goldstein (1981), I place special focus on how this structure is spatially encoded. As discussed in Chapter 2, few large Cis-Baikal cemeteries have been investigated in this way, and, consequently, the following account is necessarily more descriptive than is common for summaries of mortuary practices. This is especially the case in comparison to those contexts in which broad agreement already exists with respect to the important categories of local mortuary variability and their interpretation.

4.1 GENERAL CONTEXT

KN XIV is located on a south-facing slope 15–30 m above Lake Baikal, in a shallow cove on the northwest coast of the Little Sea (Figure 4.1). All graves lie between two

[1] A modified version of this chapter was submitted to, A. Weber, O.I. Goriunova, H.G. McKenzie (eds.), Khuzhir-Nuge XIV Monograph. Northern Hunter Gatherers: Research Series (Volume 3), in preparation.

exposed bedrock ridges—a smaller southern ridge and a much more prominent northern ridge—separated from each other by 80 m in the west and 150 m in the east (Figure 4.2). The cemetery extends approximately 260 m from west to east and consists of 79 graves with 89 individuals. As discussed in Chapter 3, one grave (G 7) [2] dates to the Late Neolithic (Serovo burial tradition), while 78 graves (containing 88 individuals) date to the Bronze Age (Glazkovo burial tradition). Excluding this single Serovo grave and the single early Glazkovo grave (G. 80), KN XIV is analyzed here as a single synchronic unit.

4.2 DATA COLLECTION METHODS

Data for this chapter were collected during five years of fieldwork (1997–2001), and they are organized within the Feature, Burial and Grave Inclusions modules of the Baikal Archaeology Project's (BAP) database of Cis-Baikal mortuary practices (Weber and Bazaliiskii 1995). As discussed in Chapter 2, each module of this database describes variation at a different scale of analysis. In general, the Feature module relates to variation of the grave itself; the Burial module describes the remains of the individuals interred within the graves; and the Grave Inclusions module consists of information relating to the artifacts and ecofacts found in association with the features and burials. Since data for all mortuary attributes are presented in Weber and Goriunova (n.d.), I describe here only those attributes that exhibit relatively substantial variation.

It should also be noted that many variables are described in more than one database module. For example, fire can affect the feature (i.e., grave architecture), the burial (i.e.,

[2] In parentheses, graves are referred to by G (e.g., G 7), while burials are referred to by B (e.g., B 7).

skeletal remains), the grave inclusions, or all three. In this study, I discuss such variables at all relevant scales simultaneously, rather than separating the discussion by the different modules.

4.3 ANALYTICAL AND STATISTICAL METHODS

Following Goldstein (1981), the spatial dimension is used as the primary organizational framework within which variation in mortuary practices is examined. In addition, age and sex are also considered to be core units of mortuary analysis. The first stage of the investigation, then, describes the variability among and interactions between the core variables of spatial distribution, age, and sex. Next, I describe the variability of mortuary attributes from the Feature, Burial, and Grave Inclusions modules, and I relate this variability to the core attributes. Finally, in order to identify potential social distinctions that are unrelated to space, age or sex, I look for meaningful associations between the mortuary attributes themselves.

Multiple Correspondence Analysis (MCA) [3] is used to provide a general overview of the relationships between multiple variables, while histograms and cross-tables are used to describe the relationships between variables in detail. Unlike cluster analysis, MCA does not force variables into groups but instead generates two-dimensional "maps", which provide a visual representation of the structure of the data (Baxter 1994, Greenacre and Blasius 1994, Jensen and Nielsen 1997). By using these maps, it is possible to identify potential associations between attributes, which can then be tested for statistical

[3] Multiple Correspondence Analysis describes a number of related statistical procedures. For this research, I used the Homogeneity Analysis via Alternating Least Squares (HOMALS) option in SPSS 11.5.0.

significance with other methods. In this study, two-sided Fisher's Exact Tests and Cramer's V are used whenever possible to evaluate the significance and strength of associations. Fisher's Exact Test is preferred to the chi-squared test, since it can be used even when the data do not meet the sample size requirements of Cochran's (1954) rule that no expected cell count should be less than 1, and no more than 20% of expected cell counts should be less than 5. In addition, as the name of the test indicates, Fisher's Exact Test provides an exact probability, as opposed to the chi-squared test, which provides an estimated probability (Fleiss 1981). Unless otherwise noted, statistical significance is defined at the 95% confidence level (alpha=0.05) and significant results are underscored in the text and tables. Although I explored the use of statistical tests such as nearest neighbour analysis to identify patterns in spatial distribution, like Goldstein (1981) I found that these techniques did not detect any previously unrecognized patterns. In fact, in some cases these methods obscured some of the obvious patterns identified through visual observation. As such, I did not employ such analyses in this study.

4.4 SPATIAL DISTRIBUTION OF GRAVES

As mentioned above, all of the graves at KN XIV are located on a south-facing slope between two exposed bedrock ridges. Seventy-seven of the 79 Bronze Age graves at the site were located immediately north of the smaller southern bedrock ridge and in a concentration that is approximately 200 m long by 35 m wide (Figure 4.3). This concentration of graves followed the contour of the ridge along an approximately north-northeast line. The single remaining graves (Nos. 2, 7) were isolated from this main concentration. Grave 2, excavated in 1992 by the Comprehensive Archaeological Expedition of the Irkutsk Laboratory of Archaeology and Paleoecology (Goriunova 1993, 1995), was located approximately 100 m north (upslope) of the southern bedrock ridge and immediately at the southern base of the larger, northern bedrock ridge. Grave No. 7—the lone Serovo grave—was located at the western extremity of the site. Although this grave was also found immediately north of the southern bedrock ridge, it is separated from the main concentration of graves by approximately 55 m and lay on a slightly elevated plateau. For the remainder of this chapter I use the term *main concentration* to refer to the group of 77 graves located immediately north of the southern bedrock ridge, while referring to Grave Nos. 2 and 7 as *isolated graves*.

Next, it is possible to classify graves within the main concentration according to their spatial relationship with neighbouring graves: graves in rows, graves in groups or scattered graves. In the middle of the main concentration, a number of clearly visible rows of graves run approximately north–south. If a row is defined as at least three closely associated parallel graves arranged in a more-or-less straight line, then at KN XIV ten north–south rows can be identified, composed of thirty-four graves (G 15–17; G 33, 26, 25; G 29–27; G 37–35; G 44–42; G 47–45; G 41–39; G 53–50; G 60–57; G 66–62). Graves that did not fall into one of the north–south rows tend to be either scattered or grouped, although it is possible that some of these graves represent incomplete or incipient rows (e.g., G 31, 32; G 81, 3; G 84, 85). In the eastern section of KN XIV, a number of graves were built in close proximity to one another (G 72, 74–76; G 80, 82–86; G 73, 78, 79, 87, 77, 81, 3; G 70, 71, 61). In comparison, the graves located in the western section were relatively scattered (G 5, 9–12, 14, 19, 21–24). The distribution of graves in rows, graves in groups, and scattered graves also forms the primary basis for dividing the main concentration of graves at KN XIV into three spatial clusters: West, Centre and East (Figure 4.3). Graves in the West Cluster were generally scattered, graves in the Centre Cluster were primarily arranged in north–south rows, and graves in the East Cluster were grouped. As I will demonstrate below, the interment of individuals within rows and clusters was one of the primary dimensions through which individuals were differentiated at KN XIV.

4.5 AGE AND SEX

The Bronze Age Glazkovo component of KN XIV consists of five females, 27 males, and 56 individuals for whom sex could not be determined; of the latter, 18 were younger than 15 years of age (Figure 4.4). For seven individuals neither age nor sex could be estimated. The lone Serovo burial (G 7) was that of an adult male (25–35 years). Grave No. 30 had no skeletal remains at all and consequently is not included in these totals.

The discrepancy between the number of males and females among the Glazkovo burials requires comment. While the greater number of males is statistically different from an expected 1:1 sex ratio (Lieverse n.d.), the high number of individuals of unknown sex must be considered. As mentioned, of these 56 individuals, 18 were children for whom osteological sex determinations are unreliable. For another seven individuals neither age nor sex could be determined, thus leaving us 31 adults of unknown sex. There are several ways to include these individuals within the analysis. First, I could follow Lieverse (n.d.) and test the proportion of males to females assuming that all of the unsexed adults are female. This technique has the advantage of demonstrating whether an extreme bias exists towards one of the sexes—in this case males. As Lieverse (n.d.) demonstrates, a one sample Binomial Test reveals that when all of the unsexed adults are included in the female category there is no significant difference between the sample proportion and the theoretical 1:1 ratio ($p<0.05$). The disadvantage here is that only extremely large departures from the theoretical 1:1 ratio will be recognized, since this approach makes the assumption that all of the unsexed individuals belong to the sex with the smaller known proportion.

As an alternative, the Binomial Test could be used to find out exactly how many of the unsexed adults would have to be female for the proportion of Glazkovo males to females to not differ statistically from 1:1. Upon comparing various scenarios at KN XIV, it was determined that it would be necessary for at least 20 of the 31 unsexed Glazkovo adults (64.5%) to be female to reject the null hypothesis that the sex ratio differs significantly from 1:1 at a 95% confidence level (Table 4.1). The question then becomes: is it likely that at least 64.5% of the unsexed adult individuals were female? Females are, in fact, consistently underestimated using osteological methods, for a number of reasons (Walker 1995). First, the smaller, more gracile bones of women do not preserve as well as the larger, more robust bones of males. Further, many osteological sexing criteria—especially those not involving the pelvis—are based on this same criteria of robusticity. In general, the greater the skeletal robusticity of the population the greater is the potential that female skeletons will be assigned to the wrong sex or classified as ambiguous. As such, it seems quite conceivable that many, if not most, of the unsexed individuals at KN XIV were female, especially given that the population is relatively robust. Given this postulate, Lieverse (n.d.) is correct that there is no clear evidence for a sex imbalance among the Glazkovo population at KN XIV despite the relative paucity of identified females. However, the possibility that females were underrepresented in the cemetery cannot be completely ruled out, and future work—including genetic analysis—may be able to provide some clues in this regard. Unfortunately, given the small number of identified females, statistical methods could not be used to compare the mortuary treatment of male and female individuals.

While the data on sex are rather limited, the estimates of age-at-death are much more detailed (Figure 4.4; Table 4.2). As Lieverse (n.d.) points out, infants are heavily underrepresented at KN XIV—probably indicating differential disposal, since it seems unlikely that infant mortality or differential preservation alone could be responsible (see also Link 1996, 1999). It is also interesting to note that the age groups 11–15 years and 20–25 years seem to be under-represented; however, the large number of individuals of unknown age or 20+ years could be responsible. Besides infants, the fact that all other subadult[4] and adult age groups were present appears to indicate that age-at-death was not a primary consideration for interment at KN XIV, and consequently that this site likely represents a community burial ground. In order to establish better whether this was the case, further studies are needed to compare the demographic profiles of different cemeteries in the region. This topic is addressed in Chapter 5.

Whenever possible, specific age categories were used to describe the distribution of mortuary variables. However, for statistical treatment it was often necessary to group individuals into the broader age classes of *adults*, *adolescents* and *children*. The category

[4] In this chapter, I use the term *subadults* for all individuals younger than 20 years of age. This age category is further broken down into *adolescents* (13–20 years) and *children* (neonate–12 years).

of *adolescents* is somewhat problematic in the sense that the transition from childhood to adulthood is culturally rather than biologically determined and can take place at different ages depending on the particular social context. As a result, archaeological evidence for the mortuary treatment of adolescents is often a confusing mixture of subadult and adult practices. For this reason, many researchers exclude adolescents from mortuary analyses and only compare adults and children (e.g. Jelsma 2000:96). In this chapter, I examined individuals of all ages in an attempt to determine at what age childhood ended and adulthood began in cultural terms for the KN XIV population, and whether or not an intermediate, adolescent stage was even a recognized social category.

4.6 CORE VARIABLE ASSOCIATIONS

Figure 4.5 summarizes the associations between the spatial and demographic characteristics of burials at KN XIV. Looking at the first dimension (x–axis), which is always the most important in any correspondence analysis, there is a clear dichotomy between subadults, interment in rows, and the Centre Cluster on the right side of the plot, and adults, the East and West Clusters, and interment outside of rows on the left side of the plot. Examination of each of these relationships in detail reveals the nature of these distinctions.

While adult individuals were buried in all three clusters, subadults (children and adolescents) were interred almost exclusively in the Centre Cluster, and almost exclusively in rows (Figure 4.6). More specifically, 12 of the 14 graves containing children were found in the Centre Cluster, and every child except one was located within one of the previously identified north–south rows. In addition, six out of the seven rows containing children included more than one child grave, while the single (seventh) row contained a single child grave (G 27) including two children. In one case, all three graves of a row (G 35, 36, 37) contained subadults, two of them being adolescents. Finally, in all but one case the rows containing children also included at least one adult grave.

As with children, the majority of adolescents were interred in the Centre Cluster, and all of the adolescents in the Centre Cluster were located in north–south rows. Two of these rows consisted of more than one adolescent grave, while another two rows contained both adolescents and children. Like the rows containing children, three of the four rows containing adolescents also had at least one adult grave. However, unlike the children, three adolescent individuals were interred in the East Cluster, and none of them were in rows. Two of the three adolescents in the East Cluster (B 71, 77) were the two youngest adolescents at death in the cemetery. Unsurprisingly, then, a Fisher's Exact Test/Cramer's V confirms a highly significant and strong correlation between age-at-death and interment in rows ($p<0.\underline{001}$, $V=0.\underline{470}$).

Table 4.3 summarizes the results of two-tailed Fisher's Exact Tests on various combinations of age-at-death and burial cluster. While statistically significant differences exist between the distribution of adults and subadults across most combinations of burial clusters, there are no differences between the distribution of adults and adolescents. The distribution of adolescents and children is statistically different across all three clusters, but they are not different when any pairs of clusters are compared.

It is clear, then, that subadults (children and adolescents) were intentionally interred within rows, almost exclusively interred within the Centre Cluster, and that these rows usually contained the graves of other subadults. Interpretation of the causality of the statistical associations between rows, clusters, and age-at-death is difficult to sort out in cultural terms. Were children and adolescents interred within the Centre Cluster because this is where rows of graves were located, or was the concentration of rows in the Centre Cluster caused by the high number of children and adolescents interred there? The fact that one row containing two children was found outside of the Centre Cluster suggests that the association between subadults and rows is not solely a product of location. However, since adults were also interred in rows, it is clear that the association between rows and the Centre Cluster is not solely a matter of age-at-death. Overall, then, it seems likely that both the rows and spatial clusters represent multiple social distinctions. The fact that neither age-at-death nor spatial cluster exhibits any significant temporal tendencies indicates that the spatio-demographic distribution is the result of enduring social practices that span the entire history of the cemetery. This might suggest, then, that KN XIV represents a community experiencing relatively stable social relations over numerous generations.

4.7 FEATURE LEVEL ATTRIBUTES

The Feature Level of analysis treats each grave as an analytical unit and includes descriptions of grave type (number of individuals and number of burial layers), topographic location relative to rivers and lakes and terraces, and grave architecture (e.g., length, width, depth, orientation, construction materials, etc.). In addition, the Feature Level of analysis includes description of grave disturbance, which was likely not part of the original mortuary protocol. Nevertheless, grave disturbance provides a number of clues regarding the original practices and so is briefly discussed here. Robertson (n.d.) provides a comprehensive analysis of grave disturbance patterns at KN XIV.

4.7.1 Grave Disturbance

Widespread during the Neolithic and Bronze Age in Cis–Baikal (Okladnikov 1950, 1955), grave disturbance is an extremely variable phenomenon that is not yet fully understood. Although in this study I will only consider those graves that exhibit unambiguous evidence of intentional disturbance by prehistoric peoples[5], it is necessary to comment briefly on the variability of disturbance patterns at KN XIV.

In general, grave disturbance can be described along two dimensions: transformation of the grave architecture and disruption of the skeletal remains (Robertson n.d.). At KN XIV, 48 graves exhibited no evidence of extensive disturbance to either the architecture or the skeletal remains, while 25 graves were unambiguously disturbed as evidenced by widespread disruption of the original grave architecture as well as disarticulated, incomplete or missing skeletal remains. In most cases, the disturbed graves were characterized by an empty ring of paving stones at the first excavation level as opposed to the tightly compact arrangement characteristic of undisturbed graves (Figure 4.7–4.8). In addition, the disturbances were usually more pronounced at the western (head) ends of the graves than the eastern ends—a probable indication that the individuals disturbing the graves were familiar with the contents (Figure 4.9). This pattern also rules out the possibility that the disturbances were the result of natural agents rather than cultural

[5] Based on stratigraphy and on patterns of skeletal articulation, all graves at KN XIV appear to have been disturbed relatively shortly after interment (Robertson n.d.; Weitzel 2005.).

agents. As discussed below in the section on skull treatment, the heads themselves may have been the target of some disturbances.

The remaining six graves were more difficult to classify since they exhibited either transformation of the architecture (G 62) or disruption of the skeletal remains (G 28, 53, 59, 63, 77), but not both. In these cases, it was unclear whether the graves might have been intentionally disturbed and rebuilt (Drouin 2005, Robertson n.d.), or whether natural taphonomic agents—including animals—might have been responsible (Weitzel 2005). It is also possible that some of the skeletal disarticulation could be have been a product of secondary burial (see discussion below on Burial Type). Because of the uncertainty surrounding the classification of these six graves, I did not include them in this analysis[6]

All the graves in the East Cluster showed some evidence of disturbance (Figure 4.10), and 19 of the 25 unambiguously disturbed graves (76%) were located in this area. Given the spatial bias towards this cluster, it is unsurprising that no children were affected, while 20 adults across all age groups and 3 adolescents were disturbed (Figure 4.11). Clearly, the individuals disturbing the graves were not only focusing on specific areas of graves (i.e., the head end), they were also focusing on specific areas of the cemetery. It is shown below that a number of other mortuary attributes are significantly associated with the East Cluster, which may provide more insights into the nature of grave disturbance at KN XIV.

[6]As mentioned above, grave disturbance is the topic of an upcoming Master's thesis at the University of Alberta (Robertson n.d.), which we hope results in a better understanding of the variability of disturbance patterns at KN XIV.

4.72 Grave Architecture

All graves at KN XIV exhibited the same basic architectural characteristics—a shallow pit covered with multiple layers of schist paving stones, which were likely obtained from local bedrock outcroppings and surrounding surfaces. The surface pavings covered areas slightly larger than the grave pits. With minor variations, these pavings were solid subrectangles in shape with the long axis oriented roughly west–east, thus reproducing the pit orientation. The length and width of undisturbed pavings ranged from around 190 x 90 cm to 520 x 360 cm, with an average of approximately 360 x 180 cm. The grave pits were relatively shallow (<55cm below the modern surface) and ranged in size from around 95 x 40 cm to 245 x 85 cm, with an average of 165 x 50 cm. It should be noted, however, that many graves lacked obvious indicators of pit walls making it difficult to estimate pit size. After interment of the bodies, the pits were filled with sediment and stones (both slab-like and angular), and in some instances the walls of the grave pits were lined with schist slabs. The shallowness of the pits and the fine texture of the sediment suggest that the graves were either placed in natural depressions alongside exposed bedrock ridges and then covered with cairns of rocks, or that only a limited excavation of pits was completed before interment. This procedure would also explain the lack of obvious indicators of pit walls in those graves where liner stones were absent.

The grave pits were oriented roughly west–east, with some slight variations that were almost certainly due to the variations in slope topography throughout the cemetery, and the changing orientation of bedrock ridges that were used as grave margins. The only exception to this pattern is Grave No. 7. This grave was oriented north–south, and on this basis was assigned to the earlier Serovo mortuary tradition[7]. As mentioned above, radiocarbon dating generally supports this cultural classification, although the collagen yield of this date was extremely low (see Chapter 3).

In general, then, the graves at KN XIV were remarkably consistent in their architectural characteristics. The relatively small differences in the physical dimensions of the undisturbed grave pits were most easily explained by the different sizes (i.e., adults were interred in larger grave pits than subadults) and numbers of individuals (i.e., grave pits with multiple individuals were larger than those with single individuals; Drouin 2005). In an extensive discussion of grave architecture at KN XIV, Drouin (2005) also suggests that male graves contained both a greater volume and a greater range in volume of paving stones than female graves; however, given the small number of identified female burials, this relationship must be considered extremely tentative. In addition, it should be noted that Drouin (2005) only systematically examined undisturbed graves, with preliminary comparisons suggesting that disturbed graves from the East Cluster at KN XIV were likely constructed out of both larger and a greater number of stones than graves in other areas of the cemetery (Robertson n.d.).

4.73 Grave Type

Grave type distinguishes single, double, and triple graves. Of the 79 graves at KN XIV, 69 contained a single individual, 7 contained two individuals, and 2 contained three

[7] In general, Serovo graves in the Little Sea region are oriented perpendicular to the lake, while Glazkovo graves are oriented parallel to the lake (Goriunova 1997, 2002; Goriunova and Khlobystin 1992; Komarova, Sher 1992; Konoptatskii 1982; Kharinskii and Sosnovskaia 2000).

individuals; one grave (G 30) contained no skeletal remains at all, and was therefore classified as "unknown" for this variable (Figures 4.12–4.13).

Individuals in five of the multiple graves (G 27, 35, 37, 57, 62) were interred synchronically, side-by-side at the same burial level; some commingling was present in two of these graves (G 57, 62) as a result of later disturbance and/or the use of fire in the grave pit. Grave No. 36 also contained two partly commingled individuals, interred at the same burial level; however, one individual was found in extended-supine position, while the other individual appeared to have been a secondary bundle-interment at the western end of the grave pit (see discussion below on Burial Type). Grave No. 37 was also unique, in that two adolescent individuals were interred along with either a near-term fetus or a neonate. Given that the presence of the fetus/neonate would have been known at the time of burial, regardless of whether or not it was born, and given that it is possible that the infant had already been born and that neither of the two adolescents in the grave was its mother, Grave No. 37 was classified as a triple interment. In Grave No. 58, two complete individuals were buried at different levels, one on top of the other, separated by a layer of paving stones. It is possible that the second individual represented a later interment. Finally, the double-graves Nos. 59 and 80 included one complete individual at the bottom of each grave pit (B 59-2 and 80-2) and one individual represented only by a cranium and associated dentition, found above burial level (B 59-1) or outside of the grave pit (B 80-1). Despite the atypical locations of the skulls comprising Burial Nos. 59-1 and 80-1, I believe that they were associated with the graves containing the complete individuals (B 59-2 and 80-2). In the case of Burial No. 59-1, although the individual skull was not located in the western part of the grave, as was typical, it was found within the grave pit and underneath two layers of undisturbed paving stones. It seems likely, therefore, that the interment of Burial No. 59-1 was not unintentional or accidental. The fact that the radiocarbon dates from Burial Nos. 59-1 and 59-2 overlapped entirely further suggested that they were interred around the same time. Burial No. 80-1 was not found in the grave pit containing Burial No. 80-2, but was instead discovered between 5 and 10 cm below the modern surface, approximately 80 cm west and 40 cm north of the western end of the grave pit. While the spatial discontinuity of Burial No. 80-1 made it tempting to conclude that it was not originally associated with Grave No. 80, the fact that the radiocarbon dates for Burial Nos. 80-1 and 80-2 were virtually identical—and were at least 400 calendar years earlier than any other burials from this part of the cemetery—suggests that the two individuals were related. Given that Grave No. 80 was extensively disturbed, it seems possible that Burial No. 80-1 was originally interred in the grave pit containing Burial No. 80-2, but was removed during a disturbance episode.

Examination of Grave Type in relation to spatial cluster and age-at-death reveals a number of patterns (Figure 4.14). Multiple graves clearly associate with subadult individuals, the Centre Cluster, and interment in rows, while single graves associate with adult individuals and with the West and East Clusters. More specifically, with the exception of the temporally unique Grave No. 80, multiple graves were all located in the Centre Cluster, and they were all located in rows (Figure 4.15). In addition, one row consisted entirely of multiple graves (G 35–37), and three out of four graves in another row were multiple (G 57–59). The final two multiple graves in the Centre Cluster (G 27, 62) were the bottom (i.e., southernmost and lowest elevation) graves in rows that were located immediately beside the rows containing the other multiple graves. In terms of age-at-death, multiple graves had a much lower proportion of adult individuals than single graves (Table 4.4). This was especially true of the two triple graves, which consisted of three subadults, two adolescents, and only a single adult. In addition, more than half (five of eight) of the adolescents at KN XIV were interred in multiple graves (three in double graves, two in triple graves).

A 3×3 two-tailed Fisher's Exact Test confirms the significant associations between grave type and both age-at-death (subadult–adolescent–adult) and interment in rows, regardless of whether grave type is considered as single–double–triple or single–multiple (Table 4.4). The association between grave type and spatial cluster is not statistically significant, except when the Centre Cluster is compared against the East and West Clusters combined; however, this is almost certainly due to the small sample sizes in the East and West clusters. The site plan shows that all multiple graves except the unique Grave No. 80 were located in the Centre Cluster; and when Grave No. 80 is excluded, the relationship between Grave Type (Single–Multiple) and Spatial Cluster is statistically significant (Fischer's Exact Test, p=0.030). When these relationships are broken down into pairwise comparisons, we see that children and adolescents are each statistically different from adults, but they do not differ from each other, which seems to indicate that adolescent individuals were treated more like children than adults in terms of grave type. Goriunova (1997) notes a similar distinction between adults and subadults in the earlier, Serovo burial tradition of the Little Sea region. More specifically, Serovo subadults were more likely to be found in multiple graves than were adults; however, unlike the Glazkovo multiple graves, all of the multiple Serovo interments were stacked, with the subadults resting on top of adults.

Overall, then, the spatial and demographic characteristics of Grave Disturbance and Grave Type are consistent with the conclusions derived from examination of the core variables. Namely, the division of the KN XIV cemetery into three spatial clusters appears to be a primary dimension of social differentiation, as was the distinction between adult and subadult individuals. In addition, it appears that the mortuary treatment of adolescent individuals was more similar to that of children than that of adults—at least in terms of Burial Cluster, Interment in Rows, and Grave Type.

4.8 BURIAL LEVEL ATTRIBUTES

Burial-level analysis considers each individual person as an analytic unit. For this study, I discuss the burial-level variables *Skull Treatment, Burial Type, Body Position,* and *Use of Fire*. Because Grave No. 30 did not contain any skeletal remains, I excluded it from this discussion. In addition, although small quantities of ochre were identified in a few graves (e.g., G 14, 31, 77), it appeared that this ochre originated from clothing or from pouches containing artifacts. As was usually the case with Serovo and Glazkovo mortuary traditions, no burials at Khuzhir-Nuge XIV exhibited the extensive discoloration that suggested the use of this mineral in burial practices; therefore, ochre was not considered in this research (but see Weitzel and Weber n.d.).

4.8.1 Skull Treatment

Although variation in the presence and location of cranial remains is clearly the result of numerous factors—including disturbance, burial type, and natural taphonomic factors—

skull treatment is discussed separately here because of the importance traditionally placed on cranial remains in the Russian literature (e.g., Gerasimov 1955; Mamonova 1973, 1980, 1983; Mamonova and Bazaliiskii 1991). At KN XIV, 51 of 84[8] individuals were recovered with the skull in anatomical position, while 8 individuals had cranial remains that were disarticulated from the post-cranial remains (Figure 4.16; Table 4.5). In both situations, the skulls were often extensively fragmented. Twelve individuals had no extant crania or mandibles, and eight burials had post-cranial remains accompanied by incomplete skulls, either consisting of mandibles only (B 58-2, 74, 77), or only teeth or tooth fragments (B 71, 73, 81, 82, 86). Three individuals consisted of only a cranium (B 26, 59-1, 80-1), and one individual was represented solely by a mandible (B 42). Finally, four deciduous tooth crowns were the only remains recovered for the neonate in Grave No. 37.

The causes of the diversity in skull treatment at KN XIV were varied. First, disturbance was likely a factor for many of the missing and incomplete skulls. The fact that teeth were recovered in five graves (G 71, 73, 81, 82, 86) where there were no other cranial remains suggests that the heads were almost certainly originally interred, and removed only later. This interpretation was strengthened when we noted that the grave architecture for each of these five graves was extensively disturbed. Likewise, while it is possible that the 12 individuals with no cranial remains were originally interred without their skulls—a pattern that has been documented in the Cis-Baikal (Okladnikov 1950,

[8] The available literature (Goriunova 1993, 1995) did not provide sufficient description of the cranial remains from Grave Nos. 1–5, and so they were not included in this discussion.

1955)[9]—the extensive disruption of grave architecture makes disturbance a more likely explanation. This is especially true for those cases in which the grave disturbance seems to have been specifically directed at the head end of the graves (G 24, 61, 76, 78, 79, 87). One of the three individual burials found with a mandible but no cranium was also clearly disturbed (B 74), while the second (B 58-2) was the lower individual in a grave with two layered burials. In this latter case it is conceivable that the cranium could have been removed when the grave was reopened in order to inter the upper individual. The third burial possessing a mandible but no cranium (B 77) was more difficult to explain. While very few skeletal elements were recovered, those that were recovered appeared to be in roughly anatomical position—with the exception of the mandible, which was flipped upside down on the chest area. While the skeletal disarticulation appeared to be consistent with disturbance, the grave architecture seemed to be intact. An alternative interpretation is that that the mandible was the only part of the skull that was interred—a pattern also seen elsewhere at KN XIV (B 42).

While disturbance is a possible cause for the missing and incomplete skulls at KN XIV, it does not adequately explain those individuals interred with dislocated skulls, nor those individuals represented solely by crania or mandibles. Of the eight individuals with dislocated skulls, only one could be unambiguously interpreted as the result of grave disturbance (B 80-2), since the other seven showed no signs of architectural disruption.

In four of the seven remaining cases, the burials were perfectly articulated with the exception of the skull, which was typically flipped over onto the chest or shoulder (B 16, 38, 44, 51). Taphonomic processes—including the actions of small animals, water,

[9] Many former excavations at Cis-Baikal cemeteries did not have trained osteologists present, and so, conceivably, some burials with only limited cranial evidence (such as individual teeth) might be described as having no cranial remains at all.

gravity, etc.—may have been responsible (Weitzel 2005), although this would have required the graves to be built in such a way as to provide enough space for the skulls to roll. Based on what we know about the grave architecture, it seems more likely that stones were piled directly on top of the bodies, which would have made it difficult to allow the movement of large body parts within the grave pit (Drouin 2005). Neither would this explain the fact that the rest of the skeletal remains were typically untouched—with the frequent exceptions of small body parts, including phalanges. An alternative explanation is that the individuals were interred with their heads already removed. This pattern was documented at a number of other sites in the Cis-Baikal (Okladnikov 1974, 1975, 1976), and could have been a result of decapitation, but could also have been a result of natural decomposition before interment. It is important to emphasize that no cut-marks were visible on any vertebrae at KN XIV (Lieverse n.d.), but the generally poor preservation of the skeletal remains often made it difficult or impossible to observe whether such marks might have existed.

The remaining three burials with dislocated skulls exhibited a general upper body disarticulation (B 53, 59-2, 63). Although the grave architecture of these graves showed no evidence of major disturbance, it seems likely, based on the pattern of skeletal disarticulation, that the bodies were, in fact, disturbed at some point after they were interred. If so, then either the skeletal disarticulation occurred inside the graves as a result of natural taphonomic processes (Weitzel 2005), or the graves were disturbed and then rebuilt (Drouin 2005; Robertson n.d.).

Finally, three individuals consisted of crania only (B 26, 59-1, 80-1), and one additional individual was represented by only a mandible only (B 42). As mentioned above in the section on *Grave Type*, Burial Nos. 59-1 and 80-1 appeared to have been isolated skulls interred in graves containing other complete individuals. Burial No. 80-1 was apparently subsequently removed from the grave pit during a disturbance episode, while Burial No. 59-1 remained within the grave pit under several layers of paving stones. Burial Nos. 26 and 42 were not associated with any other individuals, but in each case, a full-sized grave pit was constructed for the remains. Based on the lack of post-cranial remains and the lack of evidence for disturbance, it seems likely that only the heads, or parts of the heads, were originally interred. It is possible, however, that the post-cranial remains were simply not preserved—especially in the case of Burial No. 26, which was a subadult.

While the small sample sizes make statistical analysis of skull treatments impossible, it is still worth examining their various relationships with the core variables. Burials with missing or incomplete cranial remains were concentrated in the East Cluster, which is unsurprising given that this was the area with the highest concentration of disturbed graves. Six of the eight disarticulated skulls were found in the Centre Cluster, and six were located in north–south rows, including the only case in the West Cluster. Interestingly, although both the Centre Cluster and the rows had a high proportion of children and multiple interments, only one of the dislocated skulls located in the rows belonged to a child, and only one was found in a multiple grave. Finally, the four separate skull interments were found scattered throughout the Centre and East Clusters. Grave No. 80 was again atypical since it contained the only dislocated skull and the only separate skull interment in the East Cluster.

Little can be said regarding the demographic characteristics of the individuals with various skull treatments, except that adults made up the majority of the individuals with disarticulated, incomplete, missing, and separate skulls (Table 4.5).

Overall, the variety of skull treatments and the apparent targeting of the head-ends of graves during disturbances imply that heads were ascribed a special significance. At this point, it is difficult to speculate on the nature of this significance; however, it is worth noting that historically among Western Siberian groups, heads and hair—especially those of shamans—were afforded special social significance (Zaitseva 1996). It is possible that the heads, themselves, were one of the specific targets of grave disturbances.

4.8.2 Burial Type

In this study, *primary* burials are defined as those in which an individual was interred shortly after death, completely articulated. *Secondary* burials, in contrast, are those in which the skeletal remains showed evidence of having been disarticulated before interment. While this definition undoubtedly under-represents the variety of pre-interment treatments that bodies potentially underwent, it does provide a means of recognizing at least one form of secondary mortuary practice in the archaeological record. It should also be noted that this definition does not take into account the intention or meaning behind the skeletal disarticulation of secondary burials. That is, it remains an empirical question whether the pre-interment disarticulation was for functional reasons (e.g., the individual died far from the cemetery and the body began to decompose during travel to the cemetery), or ritual reasons, or both. In addition, this definition makes no assumptions about the locations of the primary treatment. In other words, it is possible that the primary treatment occurred in a separate location from the final interment, but it is also possible that it occurred at the same location.

The dominant burial type at KN XIV was clearly primary; but as mentioned above in the section *Skull Treatment*, certain individuals appeared to have received some rather substantial treatment before their interment in grave pits. Sixty-five individuals were primary interments, 10 burials appeared to have been secondary (B 16, 26, 28, 36-1, 38, 42, 44, 51, 59-1, 80-1), and in 14 cases burial type could not be determined, due to extensive disturbance, fire use (B 21, 24, 41, 61, 75, 76, 78, 79, 83, 84, 85, 87), or poor bone preservation (B 40, 70). Secondary interments at KN XIV took three general forms: separate cranium/mandible interments, interments with dislocated skulls, and bundle interments. I already discussed the four graves that were likely buried with dislocated skulls (B 16, 38, 44, 51), and the four individuals who were represented by only a cranium or mandible (B 26, 42, 59-1, 80-1).

Two additional secondary burials were classified as bundle interments. Burial No. 28 consisted primarily of a small pile of disarticulated bones in the western end of the grave pit, and Burial No. 36-1 consisted of a small pile of disarticulated bones, located immediately west of a primary interment (B 36-2). The facts that the skeletal remains in these two graves were incomplete, that the remains were highly concentrated, and that there was no evidence for architectural disturbance, together suggest that the individuals were disarticulated before they were interred rather than disturbed after interment. Both of these bundle burials were in the Centre Cluster, and both were adults. It is also interesting to note that all secondary burials were interred in full-sized grave pits. The meaning behind the secondary treatments is, for the moment, unclear. Hofman (1986) suggests that secondary bundle burials are useful indicators of seasonality and mobility; however, without an understanding of how KN XIV relates to other surrounding cemeteries it is difficult to take this suggestion further (see Chapters 5 and 6).

4.8.3 Body Position

It was possible to evaluate specific body positions for 70 of the 89 individuals at KN XIV. Nothing could be said regarding the body position for 13 individuals because of a lack of skeletal material or because the skeletal remains were heavily disarticulated (B 17, 21, 33, 37-3, 40, 41, 62-1, 62-2, 65, 70, 77, 83, 84). In addition, the two bundle interments and the four separate cranium-mandible interments were not included in this analysis.

Of the 70 individuals for which specific body positions were identified, 61 (73%) were extended-supine. Furthermore, 36 of these 61 had both arms extended alongside the body, with the hands either on or underneath the hips. Of the remaining 25, 2 had slightly flexed arms with the hands on the abdomen (B 81, 86), 1 had the left arm folded at the elbow and resting on the chest (B 19), and 22 had indeterminable arm positions, due to disturbance or poor preservation.

Less frequently, individuals were buried supine with both legs laterally splayed, and knees raised and flexed (B 24, 34, 51). Two of these individuals had flexed arms, with hands on the abdomen (B 34, 51), while the third had arms extended alongside the body (B 24). It was unclear whether the splayed body positions reflected the positions in which the individuals were interred, or taphonomic processes related to decomposition

(Roksandic 2002; Weitzel 2005). One individual was also found with both legs flexed to one side, and arms extended alongside the body (B 71).

In some cases, it was only possible to ascertain the position of either the legs or the torso, but not both. For Burial Nos. 25 and 47, the torso was clearly supine, but the position of the legs was unknown, while for Burial Nos. 12, 22, and 82 the legs were flexed, but it was impossible to determine whether the torso was supine or lying on its side. In the cases where it was only possible to see that the lower legs were extended and supine (B 31, 74, 75), it was assumed that the torso was also extended and supine, since other positions were difficult to imagine. In some cases, parts of the body appeared to be extended and supine, while other parts were disarticulated, probably due to disturbance events (B 52, 59-2). In such situations, burials were classified as extended-supine.

The splayed and flexed burials were dispersed throughout the cemetery, and exhibited no spatial tendencies. In terms of demographic characteristics, two individuals in splayed position were adults (B 24, 34), while one was an adolescent (B 51); and three of the four individuals with evidence for flexed legs were adults (B 12, 22, 82), while one was an adolescent (B 71, 12–15 years). Sex could not be determined for any of these individuals.

4.8.4 Use of Fire

The use of fire at KN XIV was extremely variable, and affected both the features (paving stones and sediment) and the burials, but not necessarily both simultaneously (Weitzel 2005). Twenty burials from 17 graves exhibited some degree of charring on the skeletal elements (Figures 4.17–4.18). In three cases, the entire length of the skeleton showed evidence of charring, although not every element was equally affected (B 52, 54, 57-2).

In two cases, the entire length of the body was affected, including the cranium, but the charring was predominantly limited to the right side of the body (B 57-1, 62-1). In five cases, the charring was limited to the skull and upper torso and arms (B 9, 25, 29, 43, 66); of these, in three individuals a bias was again seen towards the right-hand side of the body (B 9, 25, 29). In four cases, the cranium was the only element affected (B 37-1, 37-2, 38, 65); for one other individual, the charring was limited to the area of the left hip (B 24); and for yet another individual, the charring was limited to the right patella (B 34). Burial No. 28, previously defined as a secondary partial burial, showed only localized charring in the western part of the bone bundle. In Burial No. 41, all of the preserved skeletal elements were charred, although the incomplete nature of that burial made it difficult to say how representative this was of the entire body. Burial No. 62-2 was entirely disarticulated, and exhibited charring on the cranium and some long bones; because of the skeletal incompleteness, it was difficult to reconstruct whether this charring occurred before or after disarticulation. Finally, slightly charred long-bone fragments were found in Grave No. 82, but the small number of skeletal elements present made it impossible to determine how extensive the fire use was on the entire body.

Variations in the colour and condition of the charred bones also indicated that the temperature and duration of fires in the pits varied. In some cases, the bones were simply discoloured (ranging from black to white), while in other cases the bones were also fragmented transversely. Weitzel (2005) considers the taphonomic response of bone to fire, and its relevance to KN XIV.

Fire not only affected the skeletons, it also influenced other aspects of the graves, including the paving stones and sediment. In some graves, it was clear that a single firing event was responsible for both the charring of the bones and the discolouration of the surrounding stones and sediment (black and red). In other cases, it appeared that there was evidence for more than one fire affecting the grave, ranging from a few pieces of charcoal to defined patches of sediment, charcoal, and burned birch bark. In all cases where the skeletal remains exhibited charring, the surrounding sediment also exhibited a blackish discolouration, often containing pieces of charcoal and charred birch bark. It was also interesting that in some cases where the skeletal charring was limited to a small area, charred sediment was found distributed throughout the pit (G 37, 38). Occasionally, traces of fire were recorded at burial levels that did not affect the bones (G 27, 36, 47, 68, 72, 84, 85); there were also cases in which the burial levels showed no evidence of fire, but the upper layers of the grave did (G 26, 32, 34, 35, 36, 42, 44, 45, 46, 50, 51, 63, 64, 70, 73, 81, 82). Finally, there were cases in which evidence for fire use was found beside or near the graves but not actually within the confines of the grave pits (G 9, 11, 22, 41, 42, 43, 45, 46, 51, 52, 68, 72, 84).

This great extent of observed diversity made it difficult to interpret the intentions behind the use of fire. In some cases, the fires were apparently of sufficient temperature and duration to cremate the entire body, while in other cases they were only small, localized fires that barely affected the skeletal remains, if at all. The evidence for fires above burial level was even more ambiguous but, intriguingly, may reflect instances when people revisited the graves in order to perform acts of remembrance. If so, caution must be taken when interpreting radiocarbon dates based on charcoal rather than human bone, since the two materials may provide information on entirely different events. The following analyses considered only those graves in which skeletal remains exhibited charring.

Charred burials were found predominantly in the Centre Cluster, with only two burials from the West Cluster (B 9, 24) and one from the East Cluster (B 82; Figure 4.19) affected. Not surprisingly, when the cemetery as a whole was considered, statistically significant relationships existed between skeletal charring, spatial cluster, and interment in rows (Table 4.6). However, when the Centre Cluster is examined on its own, the association between rows and charring disappears, since charred individuals from this cluster were just as likely to be found in rows as not. Similarly, despite the concentration of multiple graves in the Centre Cluster, the proportion of charred individuals found in single and multiple graves was virtually identical. Finally, it was surprising to note that skeletal charring exhibited no significant relationship with age-at-death or grave type—which were both significantly associated with the Centre Cluster. Indeed, despite the abundance of subadult burials in the Centre Cluster, 11 charred individuals from this area were adult, while only 2 were children and only 3 were adolescent. The concentration of skeletal charring in the Centre Cluster, then, seems to be unrelated to the concentration of subadults, rows, and multiple graves in the same cluster. This provides perhaps the best evidence that the spatial clusters at KN XIV reflect an intersection of multiple social distinctions.

4.9 GRAVE INCLUSIONS LEVEL

In this section, I describe the artifacts recovered from KN XIV graves, classify them according to general form and raw material and examine their distribution across space and demographic categories. While future studies intend to quantify the relative "wealth" of each burial in terms of both artifact abundance and diversity, here I only point out a few burials that are exceptional in both the quantity and diversity of goods with which they were interred. In addition, because of small sample sizes, in this study I evaluated statistically only the presence and absence of artifact types, not their relative abundance. Statistically significant results for the association of grave inclusions with other mortuary attributes are summarized in Table 4.7.

At KN XIV, grave inclusions were generally placed around the upper body, and were especially prevalent under and around the head. Occasionally, clusters of artifacts were found around the waist, and likely represented toolkits interred in organic satchels or pouches that were not preserved. The same pattern has been noted at other contemporary sites in the region (Goriunova 1995).

As with mortuary variability in general, it was necessary to construct a typology of artifacts that could satisfy the requirements of the present study. Based on the history of archaeological research in the Cis-Baikal, three major distinctions were seen to be important: general function, raw material, and form. First, grave inclusions were grouped into three main classes, based on their general function as implements, ornaments, or unmodified animal remains. Next, objects were divided into broad categories of raw material, including lithic, organic, and metal. Finally, their specific form and raw material composition were considered, and the presence/absence and frequency of each inclusion type recorded for every burial. It must be noted that the above-described typology was not designed to replicate any "real" or "native" classification, nor to distinguish stylistic or symbolic items versus functional items; as Sackett (1977) points out, all objects can be at once "functional" and "stylistic", and there is no inherent reason why ornaments should be more symbolic than scrapers or axes.

In addition, for the purpose of this study it was sufficient to classify some objects according to general form and raw material only. For example, all the flakes in a particular grave were considered together, whether they were primary, secondary, retouched, etc. Likewise, with the exception of nephrite objects, most lithic artifacts were not broken down into more specific raw materials. In part, this decision was made to prevent the number of variables from becoming unmanageably large; partly it was to keep the sample sizes large enough for meaningful statistical interpretation; and partly because it will allow wider comparability with published reports in which specific artifact morphology or raw material is often not described in sufficient detail. Exact form and raw material of each artifact can be found in Weber and Goriunova (n.d.).

In many cases, it was difficult, impossible, or too arbitrary to determine whether items found in the top levels of graves should be associated with the burials or not, especially in cases of disturbed graves. Certainly it is possible that the goods were displaced from the burial levels during disturbances; however, it is equally plausible that the artifacts could have been deposited during later events, including disturbances. This is especially true at KN XIV, where the evidence for the use of fire suggests that people may have been repeatedly revisiting graves, even long after the original burials. Multiple graves also presented challenges in that it was often difficult to determine to which individual certain artifacts should be assigned. As a result, the current analysis excludes those objects that were not clearly associated with a particular burial through spatial proximity to the skeletal remains or the grave pit.

Numerous ceramic fragments were discovered at KN XIV; however, most exhibited characteristics of a later era—the Iron Age. Moreover, in all but one grave (G 16), the ceramics were found above burial level, and so could not be directly associated with the burials. As a result, ceramics were excluded from this analysis.

4.9.1 Implements

In this study, *implements* are defined as any grave inclusion for which a clear utilitarian function can be established; however, as mentioned above this does not imply that the objects would have been devoid of symbolic meaning. Nephrite axes, for example, have been interpreted as symbols of prestige in the Cis–Baikal (Okladnikov 1950, 1955).

Polished Stone Implements

Ground, or polished, stone tools are one of the hallmarks of the Neolithic Age in Siberia (Okladnikov 1950, 1955), just as they were for the original definition of the Neolithic in Europe (Lubbock 1865). Especially important are the polished nephrite and serpentine axes/adzes and knives, which have been cited as markers of social differentiation or prestige (Okladnikov 1950, 1955). Nephrite exists in the Cis-Baikal in several different colours, and comes from a range of locations. Dark-green nephrite is found in the Sayan

Mountains west of Lake Baikal, while nephrite in a range of colours—including pale green and white—is found in the region of the Vitim River northeast of Lake Baikal (Sekerin and Sekerina 2000). Besides various articles of nephrite, abraders made of ground slate were also recovered at the KN XIV cemetery.

Nephrite/Serpentine Axes and Adzes

At KN XIV, eleven polished stone axes/adzes were found in eight graves—two each from Grave Nos. 2, 74, and 86, and one each from Grave Nos. 4, 9, 84, 85, and 87 (Figure 4.20). Nine axes/adzes were found within grave pits and were thus associated with the burials, while two axes were not found in direct association with any particular individual. One of these latter two axes was found outside an extensively disturbed grave pit (G 74); however, the presence of another axe in the same grave suggests that both were likely associated. Likewise, while the axe from Grave No. 4 was not found directly associated with the skeleton, it was located beneath the paving stones and so is included in this discussion. Ten of the polished axes/adzes were made of green nephrite, and one (G 87) was made of green serpentine. Although the form of the axes/adzes exhibited some minor variation in size and shape, they were treated together for the purpose of this study.

The distribution of axes/adzes between the three main spatial clusters displays a statistically significant relationship (Table 4.7). Five of the eight graves (containing 6 of the 10 axes) were found in the East Cluster. Within this cluster, three of the graves were located in a tight group on the eastern edge of the site (G 84, 85, 86). The remaining three graves that were not found in the East Cluster but contained nephrite axes/adzes were all unique. Grave No. 2 was spatially separated from the main concentration of graves at KN XIV; Grave No. 9 was the only grave in the West Cluster containing a nephrite axe, and also one of only three graves with skeletal charring found outside the Centre Cluster. Finally, Grave No. 4 was the only grave in the Centre Cluster containing a nephrite axe. No statistically significant relationships existed between nephrite axes and age-at-death, either across or within the spatial clusters. However, it is interesting to note that none of the children at KN XIV were buried with axes, while adults from all age classes were (one young–young adult, one young adult, one middle adult, one old adult, and one mature individual), as well as one older adolescent (15–20 years). Two of the six individuals were male (B 9 and 74) while the sex of the remaining four individuals could not be determined. One adult male (B 74, 25–35 years), one adult of undetermined sex (B 86, 20–25 years), and one individual of unknown age or sex (B 2) had two axes/adzes each in their graves, while the remaining five individuals were interred with only one.

Polished Nephrite Knives

In addition to axes and adzes, nephrite was also used to make polished knives (Figure 4.21). Six nephrite knives were discovered at KN XIV, in association with six different burials (B 2, 45, 72, 73, 78, 86). Two basic forms could be identified: the first was small and triangular (B 45, 73, 78), and the second could be described as semilunar (B 72, 86).[10] Because these two forms did not show any significant variation at KN XIV in terms of their distribution through time, across space, or across demographic classes, they were grouped together for the discussion below.

[10] The available description of the nephrite knife found in Grave No. 2 (Goriunova 1995) does not permit classification by form.

Nephrite knives exhibited a statistically significant relationship with spatial cluster, with the majority (four out of six) found in the East Cluster (Table 4.7). Grave No. 2 was again an exception to this trend, as was the subadult Burial No. 45. Grave Nos. 2 and 86 were also unique in that they were the only two to contain both a nephrite axe and a nephrite knife.

Nephrite knives were found with four adults, one subadult (B 45), and one individual of unknown age (B 2). One of the adults (B 86) was determined to be 20–25 years; unfortunately, more specific ages could not be determined for the other three adults, and sex could not be determined for any of these six individuals. Burial No. 45 was a unique case, being the only child interment at KN XIV associated with a nephrite implement.

Overall, the concentration of nephrite axes and knives in the East Cluster at KN XIV seems to suggest that this might have been an area in which individuals of distinct social standing were interred. The spatial isolation of Grave No. 2, along with the presence in it of a nephrite knife and two nephrite axes, indicates that this was likely also a notable individual. Similarly, the presence of nephrite tools in Grave Nos. 4 and 45, and the use of fire and the presence of a nephrite axe in Grave No. 9, suggest that these were also individuals of distinctive social standing.

Ground Stone Abraders (hones)

At KN XIV, ten ground slate or sandstone abraders were found in association with five graves. Three graves contained a single abrader (G 14, 75, 78), one grave contained two (G 79), and one grave contained five (G 86). The great number of abraders in Grave No. 86, combined with the nephrite axe and knife there, would seem to indicate that this individual was particularly distinctive. One abrader was also found during the excavation of Grave No. 39; however, its association with the grave pit was questionable, and so it is not included in this analysis.

Four of the five graves containing abraders were in the East Cluster, including both graves with multiple occurrences, while the fifth grave was in the West Cluster. As with the nephrite artifacts, the graves in the East Cluster were statistically found to be more likely to contain abraders than the graves in the other two clusters—which again suggests that this area reflected a social distinction (Table 4.7).

Of the five individuals found with an abrader, one was identified as an adult male (B 14, 35–50 years), one individual was of undetermined sex (B 86, 20–25 years), and three could not be classified more precisely than adults (20+ years) of unknown sex (B 75, 78, 79).

Flaked Stone Implements

In addition to polished/ground stone tools, KN XIV graves contained the usual hunter-gatherer assortment of flaked stone tools, including arrowheads, scrapers, bifaces, flakes, blades, and blade insert tools.

Arrowheads

Eighty-seven lithic arrowheads were recovered from 24 graves at KN XIV; however, 12 of these could not be confidently associated with a particular burial. In total, then, 75 arrowheads could be associated with 20 burials (B 2, 4, 9, 35-1, 37-2, 38, 52, 57-2, 58-1, 64, 71, 74, 77, 78, 79, 81, 82, 83, 85, 86). The 12 arrowheads found in questionable contexts were not included in this discussion. Although a number of forms could be identified—including triangular with a straight base, triangular with a concave base, and triangular with a convex base—for the purpose of this paper we treated all arrowheads together (Figure 4.22). Future analyses are planned to examine the distributions of each projectile point type.

Eleven individuals were found with a single arrowhead (B 2, 9, 37-2, 38, 52, 58-1, 64, 71, 77, 79, 81), three with two arrowheads (B 35-1, 57-2, 82), two with three arrowheads (B 78, 85), one with four arrowheads (B 83), one with seven arrowheads (B 4), one with 17 arrowheads (B 74), and one with 18 arrowheads (B 86). The large number of arrowheads associated with these last two individuals clearly set them apart—and it is worth noting that they were both located in the East Cluster.

Although only half of the KN XIV graves containing arrowheads were located in the East Cluster, graves in this area were statistically more likely to contain an arrowhead than in either of the other two clusters (Table 4.7). In addition, the East Cluster contained six of the nine graves with multiple arrowheads—including, as mentioned above, the two graves with by far the greatest number (B 74, 87).

A statistically significant relationship was also determined between the presence of arrowheads and age-at-death (Table 4.7). In particular, adults were distinguished from children, who were never buried with arrowheads at KN XIV. Proportionately, 20–25 years adults were most likely to be interred with an arrowhead (67%), followed by 25–35 years individuals (40%). Old adults (50+ years) were the least likely to be interred with an arrowhead (14.3%). It appears, then, the older an individual was, the less likely they were to be interred with an arrowhead. It is also interesting to note that the two individuals with unusually large numbers of arrowheads (B 74 and 86, with 17 and 18 arrowheads, respectively) were relatively young adults—a 25–35 years male and a 20–25-years of unknown sex. Seven individuals with arrowheads were male, while 13 individuals could not be assigned a sex. None of the female individuals were found with these items.

Finally, it is worth noting that Burial No. 9—which was already observed to be distinctive because of the presence of skeletal charring and a nephrite axe—was again anomalous in that it was the only burial in the West Cluster associated with a lithic arrowhead.

Scrapers

Eighteen scrapers were found in direct association with ten grave pits at KN XIV. Five individuals were interred with a single scraper (B 3, 5, 25, 43, 76), three graves contained two scrapers (B 4, 73, 86), one grave contained three scrapers (B 2), and one grave contained four (B 74). Two more scrapers were found during the excavation of Grave Nos. 38 and 72; however, their association with the grave pits was questionable, and so they will not be discussed here.

Five of the ten burials with associated scrapers were located in the East Cluster, including three of the five graves with multiple scrapers. Three burials with scrapers were found in the Centre Cluster, and one in the West Cluster. Finally, as noted, the isolated Grave No. 2 contained three scrapers. The association between scrapers and burial cluster was determined to be statistically significant when all three clusters were considered at once, but pairwise comparisons showed only the Centre and East Clusters to be significantly different from each other (Table 4.7).

Only adult individuals were interred with scrapers at KN XIV; however, the small sample sizes prevented this relationship from being statistically significant (Table 4.7). Three of the burials were determined to be male, seven were classified as undetermined sex, and again no females possessed the items.

Bifaces

Seven lanceolate bifaces (Figure 4.23) were found associated with six burials at KN XIV: five individuals were associated with a single item (B 1, 57-2, 75, 78, 82), and one individual was found with two (B 87).

Four of the burials with bifacial knives were located in the East Cluster, while two were found in the Centre Cluster; however, the only statistically significant difference was found between the East Cluster and the other two clusters combined (Table 4.7).

Like axes, abraders, points, and scrapers, no children at KN XIV were found with bifaces, but the relationship was not statistically significant owing to the small sample sizes. More specifically, bifaces were found with one adult (20–25 years) of unknown sex, two adult males (35–50 years), two adults (20+ years) of unknown sex, and one individual of unknown age and sex.

Flakes and Blades

Flakes and blades were associated with 21 graves at KN XIV. Only one or two items were recovered in 15 graves (G 9, 11, 14, 21, 35-1, 46, 50, 51, 57, 61, 64, 68, 73, 76, 83); between four and six items were found in 4 cases (G 10, 70, 82, 86); and in 2 exceptional graves (G 4, 74) there were 19 or more flakes/blades.

These items were found in all areas of the KN XIV cemetery; however, the East Cluster had a higher proportion of burials interred with more than one item. The only statistically significant difference existed between the Centre Cluster and the other two clusters combined (Table 4.7).

As with most of the other implements discussed so far, flakes and blades were never associated with children, and in this case, the sample size was sufficient for the association to be statistically significant (Table 4.7). Interestingly, while adults of all ages were associated with these objects, only older adolescents (>15 years) were interred with such items—which may be a clue regarding the timing of the transition to adulthood.

Other Flaked Stone Implements

A number of other stone implements were found in limited quantities, or in a limited number of graves—including drills (G 74, 83, 86), burins (G 46, 74), and microblade insert tools (G 82, 83; Figure 4.24). Due to the low sample sizes, measures of statistical association were not applied, but it is worth noting that with the exception of the single burin in Grave No. 46, all of these lithic tools were located in the East Cluster, and all were associated exclusively with adults. No female individuals were interred with any of these implements.

Organic Implements

In addition to lithic tools, a number of items made of bone, antler, and teeth were also recovered from KN XIV. Those items that were used as implements were predominantly made of the antlers and tubular bones of roe deer, red deer, and moose.

Bone/Antler Points

The most abundant organic tools at KN XIV were antler or bone points, which were associated with ten burials (Figure 4.25). Although the forms of the points varied in size and shape, for the purpose of this study they were all treated together. Seven of the ten graves contained only one bone/antler point (G 3, 9, 31, 61, 80, 85, 86), one grave contained two points (G 14), one grave contained at least 11 points and additional bone and antler fragments (G 2), and one grave contained 13 specimens (G 74). It is worth noting that Grave Nos. 2 and 74 were already mentioned as being exceptional with regards to other implements.

Seven of the graves containing organic points were from the East Cluster, two were from the West Cluster, and one from the Centre Cluster of KN XIV. The final, tenth instance was the spatially isolated Grave No. 2. When all the clusters were considered together, there was a statistically significant association between cluster and the presence/absence of organic points, but the only statistically significant pairwise difference was between the East and Centre Clusters (Table 4.7). Like other implements, bone and antler points are associated with adults of all ages, but never with children or adolescents. Four of the individuals were male, and five were of unknown sex.

Harpoons

Antler or bone harpoons (Figure 4.26) were found associated with three burials at KN XIV—those of an adult (20–25 years) of unknown sex (B 86), an adult (20+ years) of unknown sex (B 75), and an individual of unknown age or sex (B 2).

Two of the harpoons were found in the Centre Cluster (B 75, 86), while the third was found in the spatially isolated Burial No. 2. The presence of this relatively rare artifact in these graves seems to indicate that the interred individuals were, in some way, unique—especially considering that all three of these graves were previously identified as unique in a number of other respects.

Spoons

Bone/antler spoons were found associated with three burials at KN XIV: an adult male (B 74, 25–35 years) and two adults (20+ years) of unknown sex (B 31, 61). Two of these individuals were interred in the East Cluster (B 31, 61), while the third was located in the Centre Cluster (B 31). Interestingly, Grave No. 31 was also one of the minority of graves outside of the East Cluster to contain an organic point.

Other Antler/Bone Implements

A number of other bone/antler implements were found in limited quantities, or in a limited number of graves including fishhook shanks (Figure 4.27; G 2, 74), a needle (G 61), and bone arrowheads (G 2, 86). With the exception of those recovered from the spatially isolated Grave No. 2, all of these bone/antler tools were located in the East Cluster, and all were associated exclusively with adult males or adults of unknown sex.

Metal Implements

Five copper/bronze items were recovered from KN XIV, including two knives (G 4, 74), two needles (G 11, 62), and a tube (G 55); however, none of these objects could be unambiguously associated with a particular grave pit. It should be noted, however, that Grave Nos. 4 and 74 contained atypically high numbers of other artifacts, which might suggest that the metal knives were a part of the original toolkits.

4.9.2 Ornaments

Often found on or around the head and wrists, ornaments are defined in this study as those grave inclusions that appear to have been primarily decorative in function.

Cylindrical Beads

In terms of raw numbers, the most abundant grave inclusions at KN XIV were cylindrical beads, made of either talc or antler (Figure 4.28). Therer were 5,179 beads recovered from 39 graves (30 single graves, 7 double graves, one triple grave, and one grave with no skeletal remains). Of the total, all could be confidently associated with particular grave pits, and the overwhelming majority (5,108) could be clearly associated with one of 45 particular individuals. The remaining 71 beads were found in ambiguous locations between or around multiple individuals, and so could not be positively assigned to any particular burial. In the case of Grave No. 30, there was no individual to which the single recovered bead could be assigned.

Talc beads—by far the most common (5,160 of 5,179)—were found in 39 graves, and ranged from a single bead in Grave Nos. 30 and 74 to 650 beads in Grave No. 38. The 19 antler beads were associated with five burials (B 47, 51, 57-2, 59-2, 68), and they were always found in association with talc beads.

Graves containing cylindrical beads were found almost exclusively in the Centre Cluster (Figure 4.29). Within this cluster, 37 of the 43 graves (86%) contained beads, which is statistically significant compared to the other two clusters (Table 4.7). It is also interesting that the two graves containing beads that were located outside of the Centre Cluster (G 21, 74) contained comparatively fewer beads than the graves located within it. Grave No. 74 was heavily disturbed, and contained only a single bead fragment that may or may not have been associated with the original interment; meanwhile, in Grave No. 21, the beads were clearly associated with the burial, but numbered only a total of five. While the extensive disturbance of graves in the East Cluster is a possible cause of the lack of beads in that area, the presence of beads in disturbed graves in the Centre Cluster, as well as the presence of numerous other artifacts in disturbed graves, would seem to speak against this. Instead, it seems clear that beads in the Centre Cluster were being used to distinguish these individuals from those in other parts of the cemetery. This interpretation was strengthened when we noted that the Centre Cluster had already been identified as distinctive by virtue of the arrangement of its graves in rows, the high number of multiple graves, the extensive use of fire, and the high proportion of children. Interestingly, like the use of fire, the presence/absence of beads was unrelated to any other mortuary attributes when the Centre Cluster was examined on its own.

Beads were associated with all age classes at KN XIV except neonates and 20–25-year-olds; however, the lack of association is likely caused by the small number of individuals in these two age classes. Overall, beads were found with four adult females, 20 adult males, 11 subadults, and 10 individuals for whom sex could not be determined. Seventy-three percent of children and 72 percent of adolescents at the site were interred with beads, compared with only 46 percent of adults; however, when we looked at the Centre Cluster on its own, the proportion of adults interred with beads (85%) was actually higher than that of children (78%), and every adolescent in this cluster was interred with beads. Interestingly, the three burials with an unusually large number of beads (more than 200) were all 35–50 year old males.

Finally, it was interesting to examine the six graves from the Centre Cluster that did not contain any beads. I previously identified Grave Nos. 26 and 41 as secondary separate cranium interments based on the fact that they were only represented by a cranium (G 26) and a mandible (G 41). If the beads were sewn on clothing, as is generally believed, it would not be surprising for separate cranium interments to lack beads. The same situation might have existed for Grave No. 41, which we were unable to classify by burial type due to the poor preservation of the skeletal elements. Burial No. 41 consisted of a very small number of charred skeletal elements, under what appeared to be an undisturbed paving. The lack of beads may have indicated that this burial was also secondary; however, it should also be noted that the two burials identified as secondary bundle interments did possess beads (G 28, 36-1). Grave Nos. 1 and 4 were unusual in that neither was interred within a row, and both were on the outskirts of the Centre Cluster. In addition, as we noted earlier, Grave No. 4 was unique due to the presence of a nephrite axe as well as atypically large numbers of flakes, blades, and arrowheads. Grave No. 4 also contained a metal knife—although, as was mentioned above, this knife could not be unambiguously associated with the burial. Finally, Grave No. 31 was unique in that it was one of only five graves in the Centre Cluster to be extensively disturbed, and it was the only burial in the Centre Cluster interred with an organic point. It would appear, then, that the absence of beads in these graves was meaningful and may relate to other unique characteristics.

<u>Red Deer Canine Pendants</u>

Common throughout northern Eurasia during the Mesolithic and Neolithic, the perforated canines of red deer were also frequently found at KN XIV (Figure 4.28). In total, 125 canines were found in 17 graves (16 single burials, 1 double burial). In all cases, the artifacts could be clearly associated with one of the 18 specific individuals (B 16, 24, 35-1, 36-2, 37-1, 37-2, 45, 49, 59-2, 61, 68, 70, 77, 79, 80-2, 87), and ranged from a low of one canine per individual (B 24, 59-2, 61, 68, 70) to a high of 26 per individual (B 37-2).

Red-deer canine pendants were found in all areas of the cemetery; like all artifacts, they were least frequent in the West Cluster, where only two graves included them. The four individuals with the highest number of pendants were all interred in the same row (B 35-1, 36-2, 37-1, 37-2), which provides additional evidence that rows at KN XIV likely represented social groupings, such as a clan or kinship lineages.

Canine pendants were associated with all age classes except neonates and 20–25 year-olds. The broad range of ages apparently indicates that age was not an important consideration for interment with pendants; however, it should be noted that proportionately, almost half of the adolescents (12–20 years) and old adults (50+ years) at KN XIV possessed pendants, while in all other age classes fewer than 20% of the individuals were buried with these objects. In addition, five of the six burials with more than ten pendants were adolescents—including the burial with the highest number (B 37-1). None of the identified female burials possessed pendants.

Ground Stone Discs

Besides cylindrical beads and red-deer canine pendants, the most frequent decorative items at KN XIV were ground stone discs with a central aperture, which were usually found on or around the head or upper chest region, and were assumed to have been part of the headgear or clothing of the deceased individuals (Okladnikov 1950). In total, 27 discs[11] were recovered, 26 of which could be clearly associated with one of 17 individuals from 17 different graves (15 single graves, 1 double grave, 1 triple grave).

[11] The disc from Grave No. 60 is described as a ring in Weber et al. (n.d.); however, I believe that disc is a more appropriate classification.

One disc was found in a questionable context (G 84), and so was not included in this discussion.

The discs at KN XIV were made of either limestone or nephrite, and were classified into two sizes; large discs measured 4–6 cm in diameter, while small discs measured 1–2 cm in diameter. Discs of both sizes were less than 5 mm in thickness. For the present discussion, I treated all discs together, but future studies will examine the size, shape, and location of the discs in KN XIV graves in more detail. It is interesting that the graves containing multiple discs often consisted of pairs of small and large varieties. In Grave No. 42, this was made even more obvious by the selection of materials—two limestone discs (one large and one small) were paired with two nephrite discs that were identical in size to the limestone discs (Figure 4.30). This pattern of pairing large and small was also exhibited in the distribution of rings, which are discussed below.

Eleven individuals were interred with a single disc, seven of which were made of limestone (B 12, 33, 60, 78, 81, 82, 87), and four of nephrite (B 15, 24, 27-2, 38). Six burials contained more than one disc: two had one limestone and one nephrite disc each (B 5, 37-1), one had two limestone and two nephrite discs (B 42), two had two nephrite discs (B 25, 47), and one had three nephrite discs (B 85).

Both limestone and nephrite discs were found in all areas of the cemetery, and they were interred with individuals of all age classes except neonates. Proportionately, adults were most often interred with discs (22%), while adolescents possessed them least often (9%). The distribution was fairly even across the adult age classes, and varied only from around 18% in 25–35-year-olds to 33% in 20–25 year-olds. One female, five males, three subadults, and nine individuals of undetermined sex were associated with the items. The broad distribution of ages and sexes seems to indicate that these were not primary factors for interment with these objects.

Rings/Bracelets

In addition to discs, seven "rings" were found in six graves at KN XIV; they were made of limestone, nephrite, and copper/bronze. Two graves (B 25, 47) contained both discs and rings. Like the discs, the multiple rings were paired into large and small varieties; in Grave No. 25, two metal rings were found that were identical in diameter to the two nephrite discs found in the same grave (Figure 4.31). This is similar to the pattern observed above in Grave No. 42, where the two nephrite discs were identical in form to the two limestone discs.

Like the discs at KN XIV, many of the rings were located in the vicinity of the skull, and may have been used on clothing in the same way that discs were presumed to have been used (G 25, 35, 57). In three cases, rings were found in the region of the wrist or waist (G 25, 47, 52), while one ring was found in the area of the left elbow (G 72).

The rings varied in both diameter and thickness of the band. Two rings, one nephrite (G 35) and one copper/bronze (G 52), were large and thick (~5 cm in diameter and ~0.7 cm thickness); the latter was found in the vicinity of the right wrist, and so may have functioned as a bangle. The bronze/copper ring from Grave No. 57 also had a large diameter, and it was constructed of thin wire. As mentioned above, the two bronze/copper rings from Grave No. 25 were similar in diameter to the previously discussed nephrite and limestone discs from the same grave, as was the nephrite ring from Grave No. 72 (~3 cm in diameter). Finally, Grave No. 47 contained one very small limestone ring (1.5 cm in diameter) that was accompanied by two very small nephrite discs (1 cm in diameter each).

Five of the six burials containing rings were located in the Centre Cluster, and one was found in the East Cluster (G 72). Rings were interred with one child (3–4 years), one adolescent male (18–20 years), one adolescent female (18–20 years), one adult male (35–50 years), one adult (25–35 years) of unknown sex, and one adult (20+ years) of unknown sex.

Other Ornaments

Burial No. 42 was interred with a perforated red-deer hyoid, as well as 11 perforated roe deer phalanges, that were likely also used as pendants (Figure 4.32), or possibly as a rattle (Ovodov et al. n.d.). In addition, a child of unknown sex (12–15 years) was interred with a concentration of ten round pebbles (Figure 4.33), ranging from 0.5 cm to 0.8 cm in diameter (B 77). The pebbles were clearly water-worn, and did not originate in the immediate vicinity of the grave. The function of these pebbles is unknown; however, similar finds have been documented from other sites in the region—including Sarminskii Mys, located approximately two kilometres from KN XIV (Goriunova 1997). Grave No. 77 was located in the East Cluster, and was one of only two child burials in this area of the cemetery.

4.9.3 Unmodified Animal Remains

The final category of grave inclusions I examined for this study included the unmodified skeletal elements of animals, such as teeth, claws, jaws, scapulae, foot bones, and vertebrae (Ovodov et al. n.d.). Four graves contained the mandibles or maxillae of animals, including beaver (G 2, 74, 86), fox (G 2, 74), sable (G 74), and seal (G 3). A variety of animal teeth (other than the perforated red-deer canines discussed above) was also recovered, including a bear canine (G 2), a bear molar (G 76), a musk deer canine (G 2), a red-deer molar (G 38), and a wolf canine (G 72). Scapulae from red deer (G 2) and roe deer (G 74) were recovered, as well as five red-deer vertebrae (G 84) and a red-deer phalanx (G 50). Birds were represented by the talons of a golden eagle in Grave No. 2 and of a Eurasian eagle-owl in Grave No. 14, while fish were represented only by a single vertebra in Grave No. 11. An articulated hare's foot was found in two graves (G 3, 61), and, finally, an astragalus from a possibly domesticated ram was recovered during the excavation of Grave No. 74; however, this unit was extensively disturbed, and so it is unlikely that the bone was originally associated with the grave.

Seven out of the 12 graves containing animal remains were located in the East Cluster, and all but two were adults (B 50, 84). None of the graves contained identified females. It is noteworthy that the two graves containing by far the greatest number of animal remains have already been cited as exceptional in a number of other regards (B 2, 74).

4.9.4 *Associations between grave inclusions*

With the exception of the single nephrite knife in Grave No. 45, not a single implement or unmodified animal bone was found associated with a child's burial; meanwhile, every class of ornament was associated with at least one child. In contrast, adults at KN XIV were interred with various combinations of implements, ornaments, and unmodified animal bones. When the distribution of artifacts is examined over more specific age categories other patterns are visible.

First, when the age category of adolescents is divided into *young adolescents* (13–15 years) and *old adolescents* (15–20 years), it was determined that only one of the seven young adolescents was buried with an implement, compared to six out of nine old adolescents. In addition, no adolescent individuals aged younger than 15 years were interred with unmodified animal remains. The distribution of artifacts across the adolescent age groups, then, suggests that 15–20 year-olds were perceived to be more similar to adults than to children—at least in terms of the kinds of artifacts they were buried with. Assuming that grave inclusions reflected societal roles (e.g., Binford 1971; Tainter 1978; O'Shea 1984; Carr 1995), then the lack of implements or animal remains in children's graves may indicate that children were not involved in hunting or other domestic activities to the same extent as adults, and that this transition occurred somewhere before 15 years of age. If so, this would be broadly similar to ethnographic accounts of Siberian hunter-gatherer-fishers, which have indicated that significant participation in domestic activities began between 12 and 14 years of age (e.g., Jordan 2003:63). Recall, however, that KN XIV adolescents of all ages were more similar to children than to adults in terms of burial location in rows, multiple graves, and burial clusters. The similarity of old adolescents (15–20 years) both to adults (by types of grave inclusions) and to children (by grave location and grave type) seems to reflect the liminal state of these individuals between childhood and adulthood.

Next, it appears that 20–35 year old adults were interred with the greatest number and diversity of artifacts, while adults aged 50 years or older were buried with the fewest. This, again, may be an indication that older adults (50+ years) were perceived to hold different social roles than younger adults. When we examine an MCA map of all the KN XIV artifacts, a clear distinction is visible between implements and unmodified animal remains on the left, and ornaments on the right (Figure 4.34); this supports a distinction between individuals associated with hunting/domestic activities and those that were not.

Spatial distinctions also appeared to have been important: implements and unmodified animal remains were associated with the East Cluster (Figures 4.35–4.36), beads and rings were associated with the Centre Cluster, and red-deer canine pendants and discs were located in all three clusters (Figure 4.37). Moreover, the West Cluster contained relatively few artifacts of any type. In part, the spatial distribution of artifacts may be explicable in terms of age since children (associated with ornaments) were buried almost exclusively in the Centre, and adults (associated with implements) were interred in the East and West Clusters. However, cylindrical beads, which were found predominantly in the Centre Cluster, showed no age-related associations within that Cluster, clearly indicating that the concentration of beads in this area was related to other social distinctions. In addition, the East and West Clusters, which had similar age-at-death profiles, were very different in terms of both abundance and diversity of artifact types. More specifically, 95% of the graves in the East Cluster contained at least one implement, compared to 43% in the West Cluster, while 83% of the graves in the East Cluster contained ornaments, compared to 43% in the West Cluster. Both of these associations were statistically significant (Table 4.7). The East Cluster also contained, by far, the greatest number of artifact types, and many types were found exclusively, or almost exclusively, in this part of the cemetery (nephrite axes/adzes, nephrite knives, abraders, lanceolate bifaces).

Finally, a number of artifacts that were found throughout the cemetery (lithic projectile points, bone/antler points) were found in much higher numbers in the East Cluster than anywhere else. Taken together, these patterns suggest that the East and West Clusters contained individuals of different social standing. Furthermore, the specific toolkits associated with the individuals in the East Cluster suggest an association with hunting. The relatively larger grave carins (Robertson n.d.), the presence of nephrite implements, which have been cited as prestige items (Okladnikov 1950, 1955), and the fact that graves in this cluster were apparently targeted by grave disturbers, all further suggest that these individuals may have been perceived to hold a higher social status than those in other areas of the cemetery. Indeed, if artifact abundance and diversity can be taken as an indicator of status (e.g., Tainter 1978), then individuals buried in the West Cluster would appear to have been perceived as having a lower status than those in the other clusters. The Centre Cluster is more difficult to evaluate in such terms because of the high number of subadult individuals and intersecting dimensions.

While a statistical analysis of grave inclusions to establish the relative "wealth" of burials at KN XIV will be presented in future work, I offer here a few preliminary observations. Three burials in the cemetery can be distinguished by the unusually wide variety and high number of grave inclusions with which they are associated, and by the similarity of their toolkits. Burial Nos. 2, 74, and 86 were each interred with two nephrite axes/adzes, as well as atypically large numbers of scrapers, lithic points, bone/antler points, and unmodified animal bones. In addition, these three burials are also similar in that they all lacked ornaments, with the exception of a single bead of questionable association in Grave No. 74. Clearly, these three individuals were distinctive, and based on their toolkits it would appear that they were identified as hunters. Although located outside of the East Cluster, Burial Nos. 4 and 9 can likely also be included in this group. Burial No. 4 was associated with a nephrite axe (the only axe interred in the Central Cluster), numerous lithic points, flakes, blades, and scrapers; moreover, it possessed no ornaments, despite its location in the Centre Cluster where, as discussed previously, over 85% of the graves contained cylindrical beads. Grave No. 9 also contained a nephrite axe/adze (the only axe/adze in the West Cluster), and it was also the only grave in the West Cluster to contain a lithic point. It was also one of only two graves in this cluster to be associated with a bone/antler point. Finally, Burial No. 9 possessed no ornaments and was one of only three burials in the West Cluster (out of 20) to exhibit skeletal charring. While the demographic characteristics of Burial Nos. 2 and 4 are unknown, the other three individuals were all male. Interestingly, the ages of the three males were 20–25 years (B 86), 25–35 years (B 74), and 50+ years (B 9)—indicating that age-at-death was likely not the primary factor distinguishing these individuals.

Although the small number of identified female graves makes any discussion of sex variability difficult, a few tentative observations are in order. First, none of the five identified females at KN XIV were interred with implements. Two flakes were recovered from Grave No. 57, which contained one adult male (35–50 years) and one adolescent female (18–20 years), but the objects could not be associated confidently with either individual. In terms of ornaments, one female was interred with a disc (B 60), and another female was buried with a ring (B 57-1). Four out of the five identified females were associated with cylindrical beads, but we have seen that this is likely a product of their location in the Centre Cluster. Indeed, the sole female interred without cylindrical beads was located outside of the Centre Cluster (B 19). The lack of implements and the presence of ornaments in female graves is more similar to the pattern observed for children than for adult males; however, the extremely small number of identified females and the large number of individuals of unidentified sex make it impossible to generalize for the entire KN XIV population.

4.10 CONCLUSIONS

Overall, the analysis presented in this study indicates that a primary dimension of mortuary variability at KN XIV was the division of the cemetery into three well-defined spatial clusters. The East Cluster is characterized by larger grave cairns, a lack of subadults, the presence of more abundant, more diverse, and rarer grave inclusions, and extensive grave disturbance. The Centre Cluster, while generally possessing fewer and less diverse grave inclusions than those in the East Cluster, is distinguished by the abundance of cylindrical beads, extensive skeletal charring, interment of burials in rows, the presence of multiple graves, and by the overwhelming majority of subadult individuals. The West Cluster, in contrast, is characterized by a general absence of all attributes common in the other areas of the cemetery including disturbed graves, multiple graves, secondary burials, use of fire, rows, and by comparatively fewer artifacts and artifact classes. Interestingly, these spatial clusters do not appear to reflect a single social distinction, but rather they seem to encode a number of intersecting distinctions making it difficult to offer conclusive statements as to their meaning.

Part of the problem is that it we currently have a poor understanding of the scale of the social units that were associated with Little Sea mortuary sites. Do individual mortuary sites represent individual communities? Did multiple contemporaneous communities use the same cemeteries? Or did individual communities use multiple sites to inter smaller social units such as kinship lineages, status groups, or individuals? To answer such questions a regional approach is clearly required, and I address this topic in Chapter 5; however, based on the available evidence from KN XIV, it is possible to make some preliminary statements—at least with respect to this one site.

When KN XIV is considered as a whole, the inclusion of children, adolescents and adults implies that the site likely would have acted as a community cemetery in which a broad cross-section of the population was interred. This is not to say that every individual in the community would have been buried at KN XIV, it is only to say that, in general, it does not appear that the site was particularly restrictive—at least in terms of age and sex. The one exception to this statement is that infants (< 3 years old) appear to have been deliberately excluded from KN XIV.

It is, of course, possible that the three spatial clusters at KN XIV represent three different communities; however, this would require us to conclude that only one of the communities interred their children at KN XIV (Centre Cluster). Instead, it seems more likely that the three clusters represent one of the means used by Bronze Age peoples to signify intra-community social distinctions.

Age-at-death was clearly one of the important distinctions encoded at KN XIV since subadult, adolescent and adult individuals were treated differently in death. Children were interred almost exclusively in rows within the Centre Cluster, which in turn usually contained more than one child grave. In addition, children were more often interred in multiple graves than adults. Finally, children were not buried with implements of any kind, but they were usually buried with some form of ornament. To the extent that grave inclusions can be taken as evidence for social roles, this would seem to indicate that children were not perceived to possess the knowledge or skills associated with independent living, and that they were instead interred in larger social collectives such as family or clan groups, which were manifested in multiple graves and rows.

In contrast, adults were buried in single graves throughout the entire cemetery, and with both implements and ornaments. In general, younger adults (20–35) were interred with a greater number and variety of artifacts than old adults (>50 years of age), which may indicate that they were perceived to hold different social roles; however, the relative samples sizes of each group is likely also partly responsible for this pattern. Adolescent individuals were afforded mortuary treatments that in some ways resembled the treatment of children but in other ways resembled the treatment of adults. More specifically, like children, adolescents of all ages were concentrated in the rows and multiple graves of the Centre Cluster. Unlike children, however, adolescents older than 15 years of age were often interred with implements in addition to ornaments. It could be that this represents evidence that the social transition from childhood to adulthood occurred somewhere just before 15 years of age. Jordan notes that among contemporary Khanty hunter-gatherer groups in Western Siberia ". . . young boys are taken hunting and trapping by older males [and] by the age of twelve or fourteen most are able to conduct these tasks independently (2002:63)."

Treatment at death also distinguished individuals with respect to social distinctions that were only partly related to the age of the individual. The larger grave cairns, the lack of subadults, the presence of more abundant, more diverse, and rarer grave inclusions, and the extensive disturbance of burials in the East Cluster all suggest that these individuals were likely perceived to hold a higher status in relation to individuals buried in other parts of the cemetery. Furthermore, the specific toolkits associated with these individuals suggest an association with hunting. Note, however, that an isolated number of individuals in other parts of the cemetery also seem to have been perceived in similar ways (B 2, 4, 9).

Group affiliation also appears to have been an important social distinction reproduced in mortuary treatment. Individuals in the Centre Cluster, while generally possessing fewer grave inclusions than those in the East, were distinguished by the abundance of cylindrical beads, extensive skeletal charring, interment of burials in rows, the presence of multiple graves, and by the overwhelming majority of subadult individuals. Interestingly, these attributes were determined not to be mutually related, and it appears that the Centre Cluster was a nexus for the complex interaction of a number of social distinctions. First, as already mentioned, statistical associations were found between subadults, interment in rows, and multiple graves. Unrelated to these attributes, but still associated with the Centre Cluster, were the use of fire and the presence of cylindrical beads. Thus, individuals in the Centre Cluster seem to have been distinguished not only by their age-at-death, but also on the basis of some other social distinction. The nature of this additional social distinction is, for the moment, unclear, but Carr (1995:165) notes that worldwide intra-cemetery grave location is most commonly associated with horizontal social positions, such as kin groupings. Ongoing genetic and stable isotope analysis of the KN XIV skeletal remains may also help to evaluate this possibility.

Overall, then, the research described in this chapter demonstrates very clearly that microscale analysis offers an important perspective on Cis-Baikal mortuary practices that has been missing to date. In particular, examination of the spatial dimension of mortuary variability has revealed some important trends relating to the scale and nature of the social unit(s) using KN XIV. Cannon suggests that "spatial representations of death develop over time as historical narratives of social memory [that were] created and partially understood by people in the past . . . (2002:192)." In the case of KN XIV, the fact that the three spatial clusters apparently remained meaningful over the estimated 340–660 years of cemetery use clearly indicates that the spatial representation of death was understood and actively maintained by Glazkovo peoples over numerous generations. This, in turn, suggests that social and political relations were reasonably stable over this period. The next step is to investigate how historical narratives at individual sites relate to each other, and how they combine to form regional mortuary landscapes. This is the topic of Chapters 5 and 6.

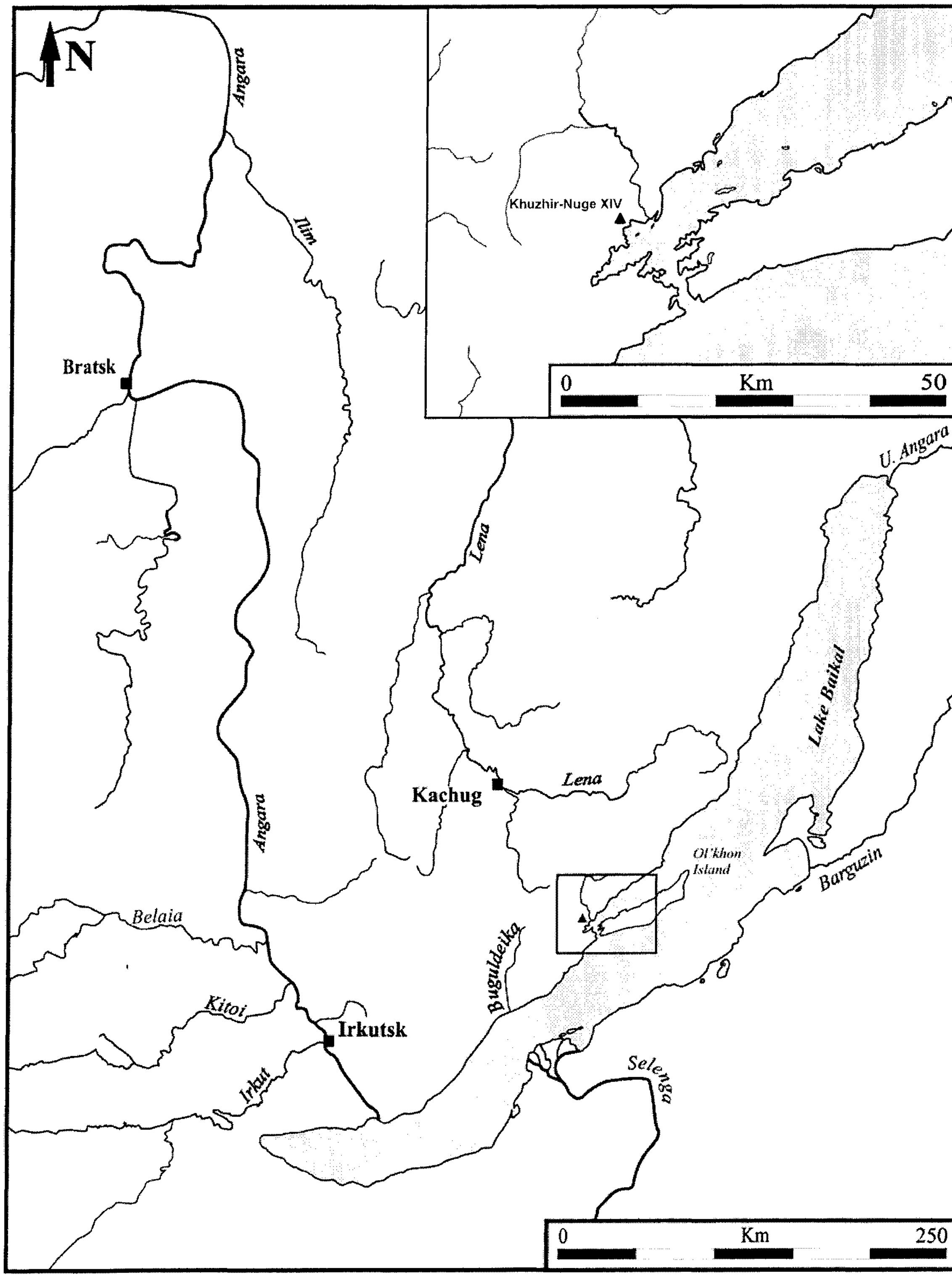

Figure 4.1: Map of Cis-Baikal, with inset to Little Sea and Khuzhir-Nuge XIV site

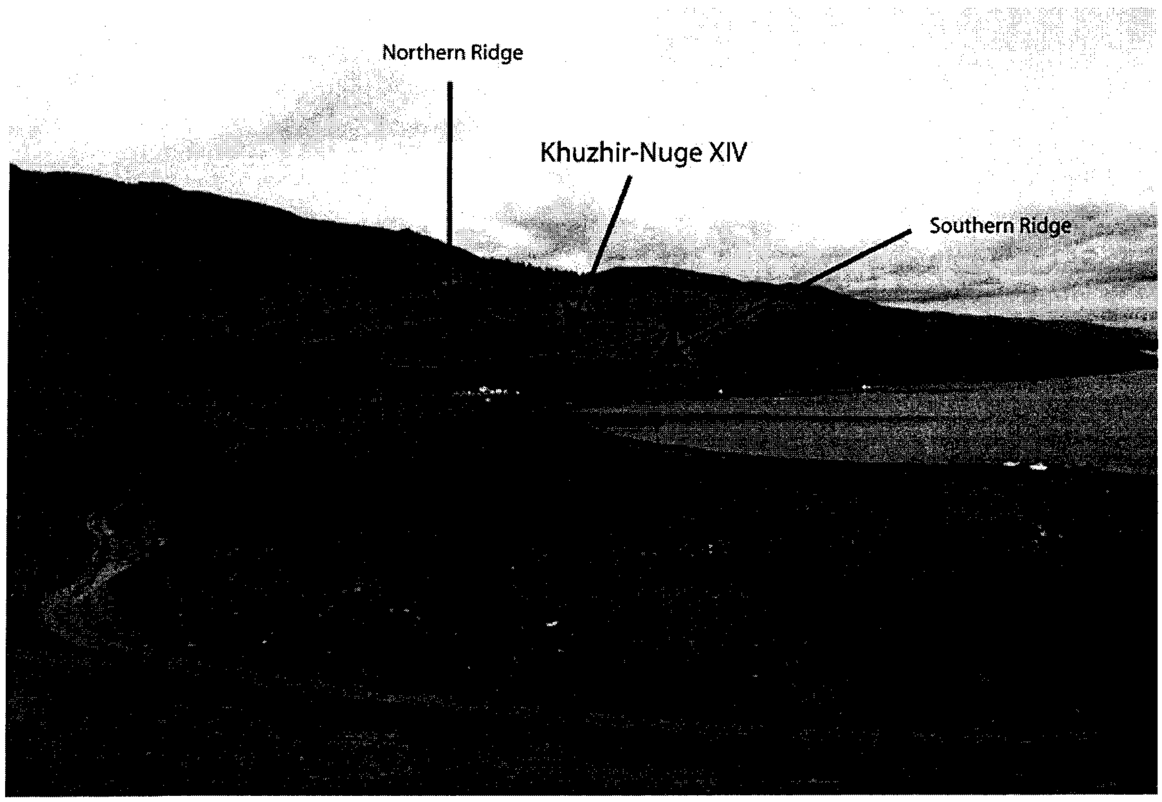

Figure 4.2: Location of the Khuzhir-Nuge XIV cemetery (from the southwest); photo A Weber

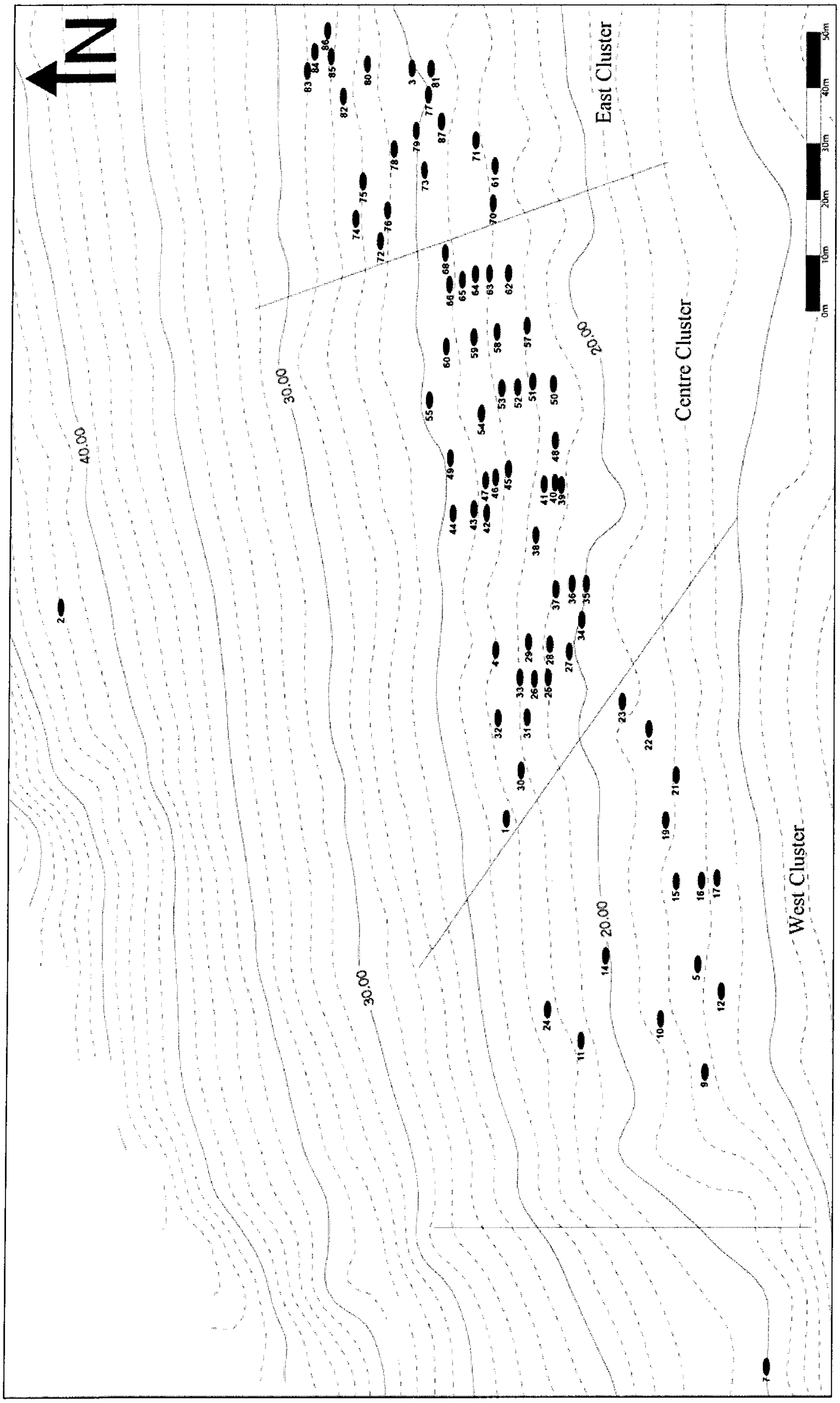

Figure 4.3: General site plan of Khuzhir-Nuge XIV cemetery, indicating analytical clusters

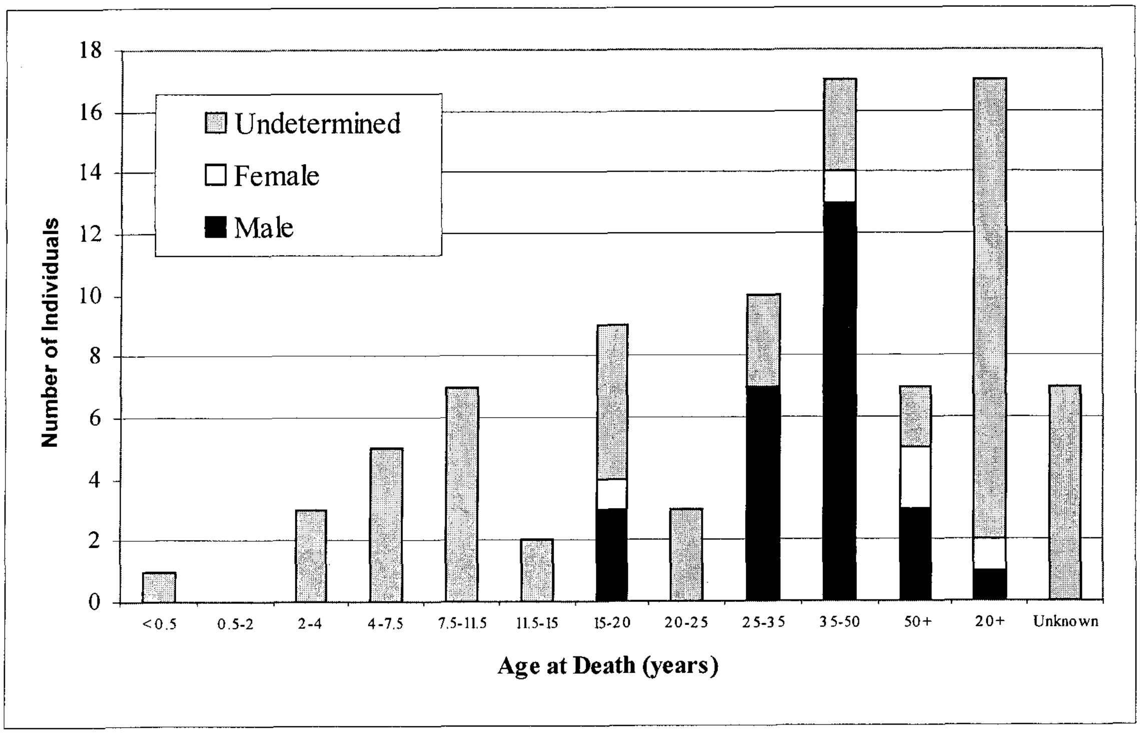

Figure 4.4: Demographic profile of Glazkovo individuals at Khuzhir-Nuge XIV (n=88)

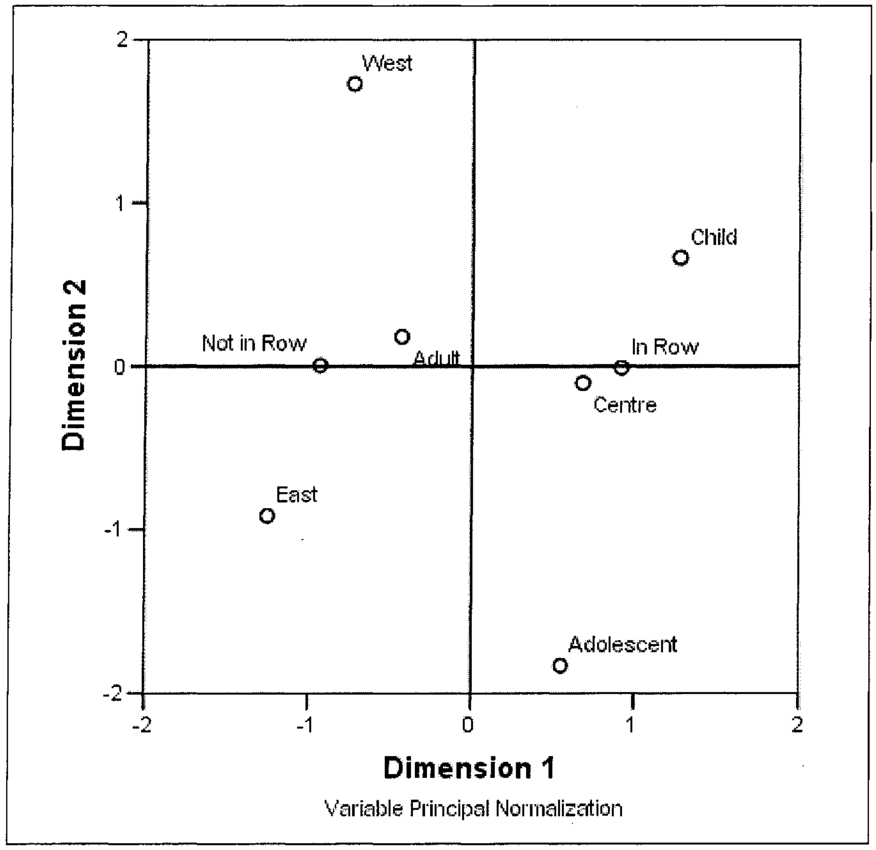

Figure 4.5: Multiple correspondence analysis map of core attributes at Khuzhir-Nuge XIV

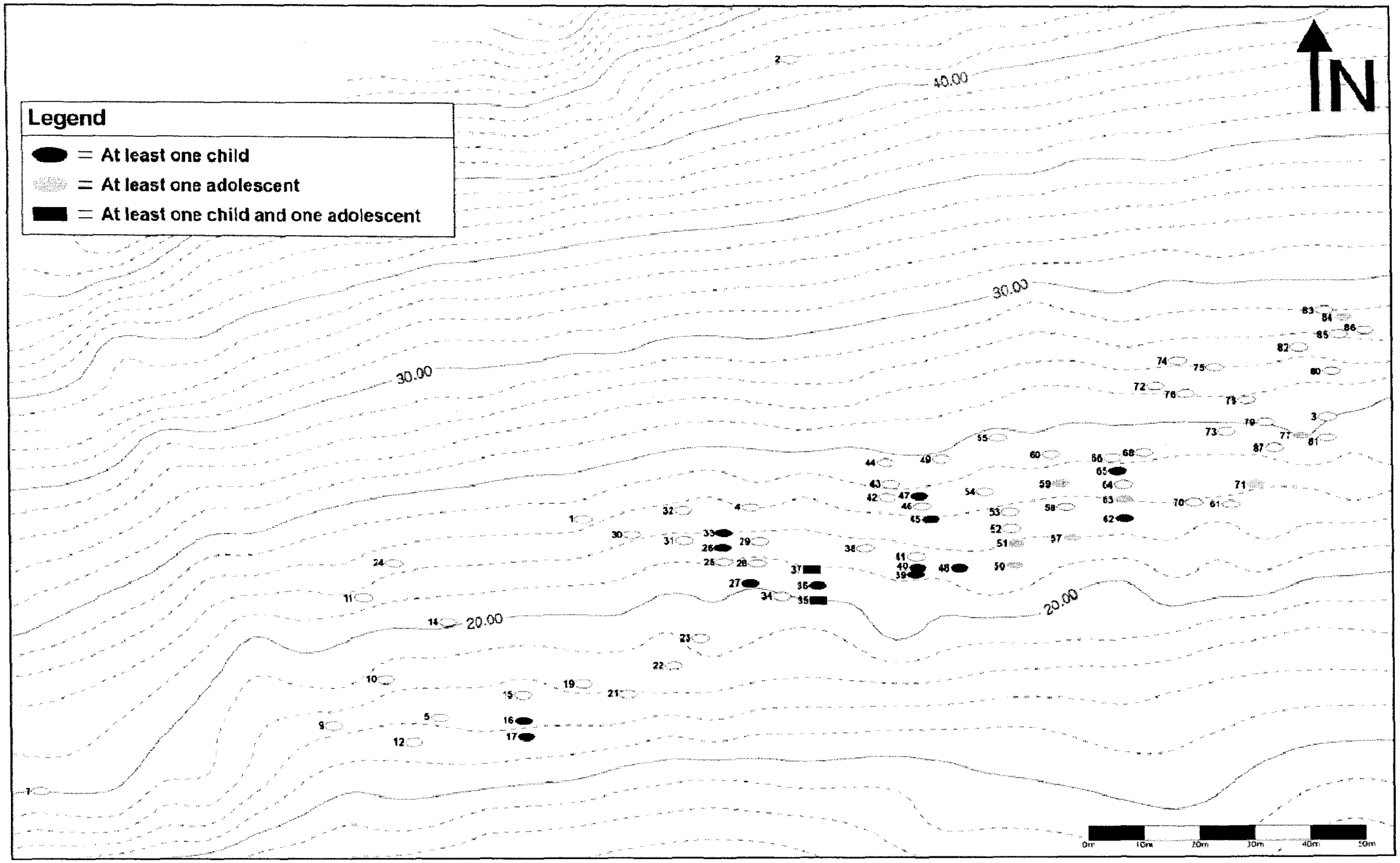

Figure 4.6: Spatial distribution of child and adolescent burials at Khuzhir-Nuge XIV

Figure 4.7: The first excavation level of an undisturbed grave at Khuzhir-Nuge XIV; photo A Weber

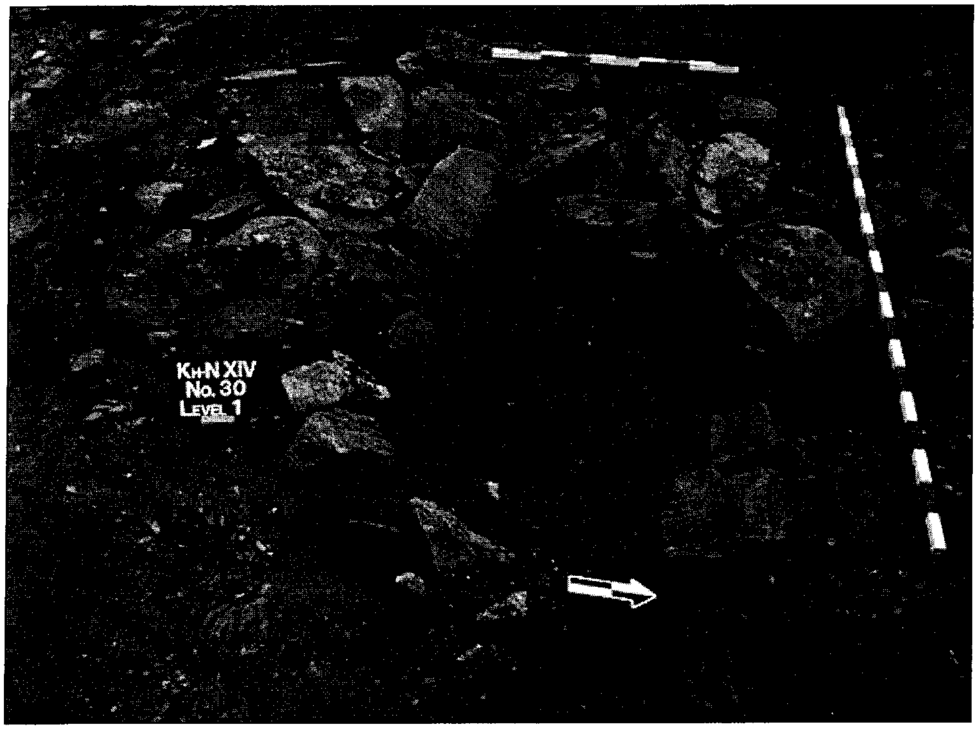

Figure 4.8: Burial level of a disturbed grave at Khuzhir-Nuge XIV; photo A Weber

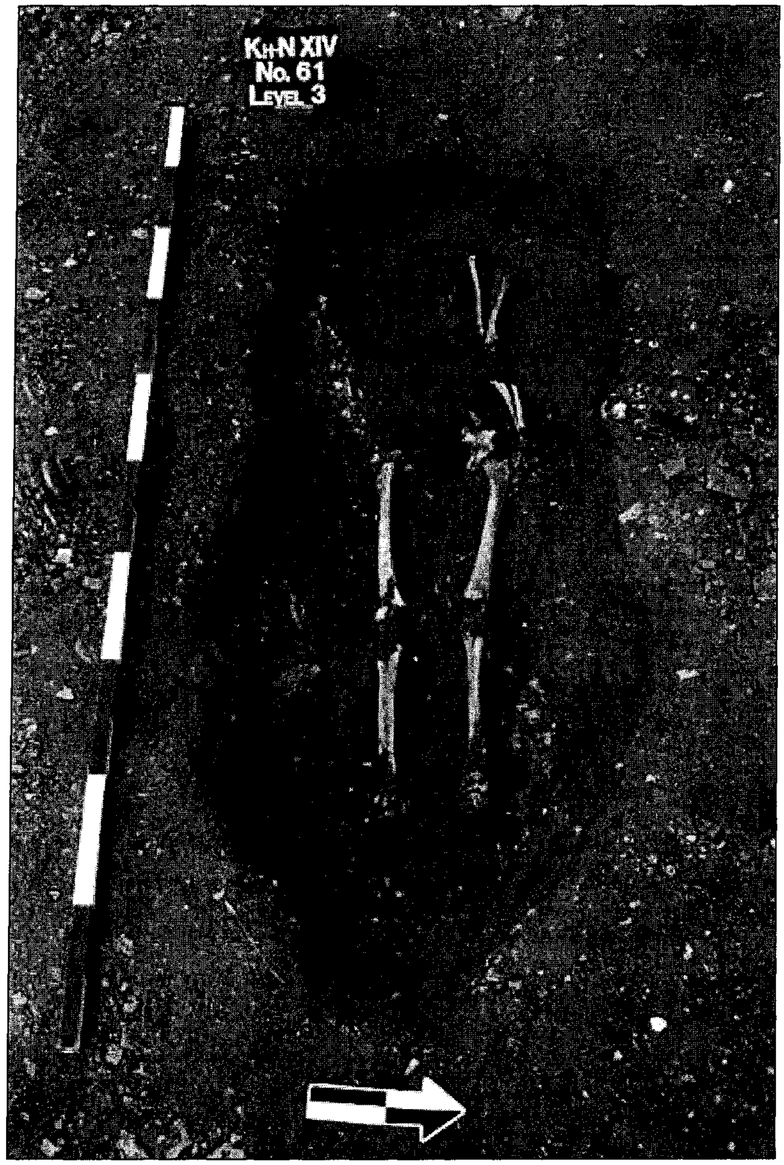

Figure 4.9: Example of the burial level of a disturbed grave at Khuzhir-Nuge XIV; photo A Weber

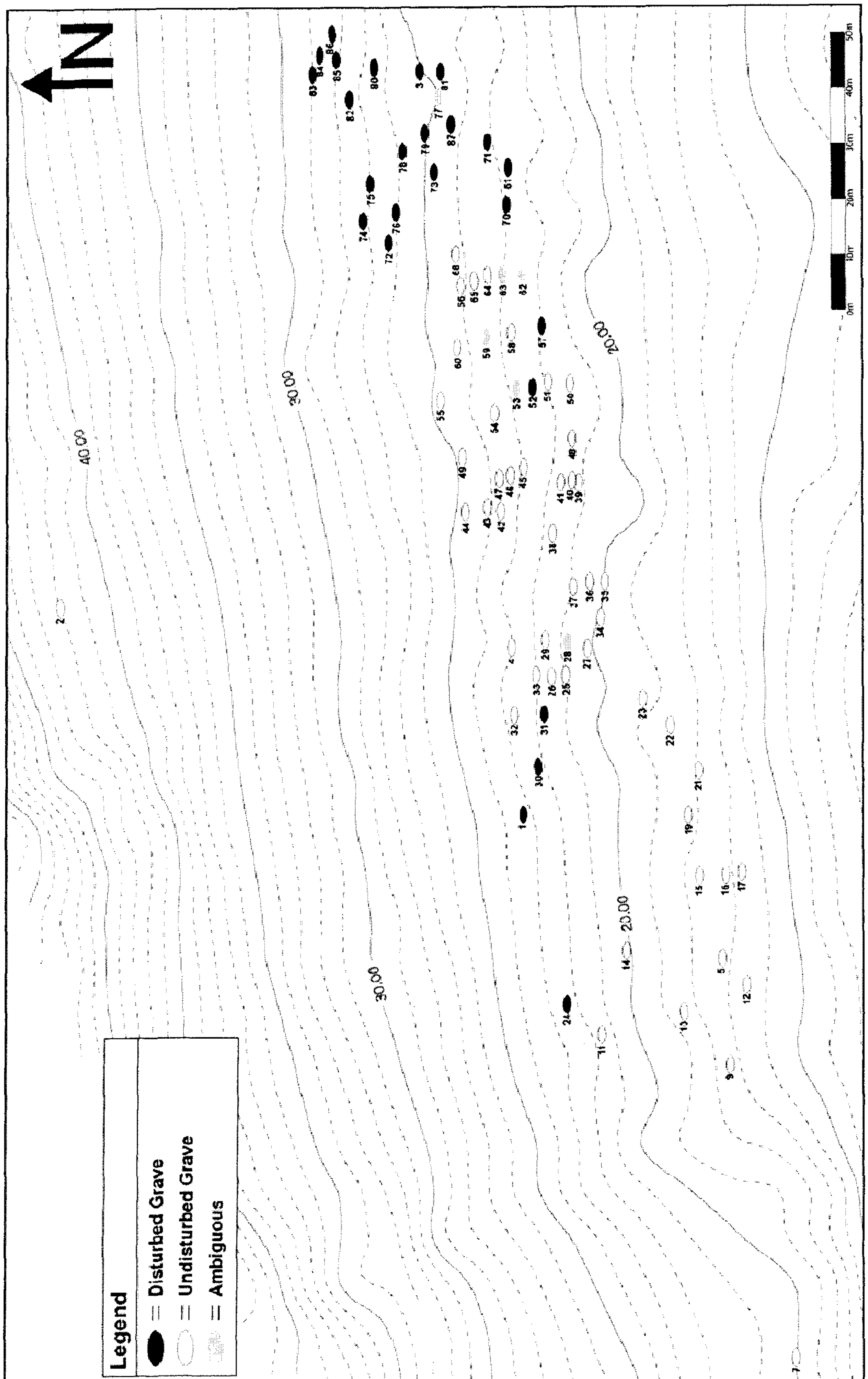

Figure 4.10: Spatial distribution of disturbed graves at Khuzhir-Nuge XIV.

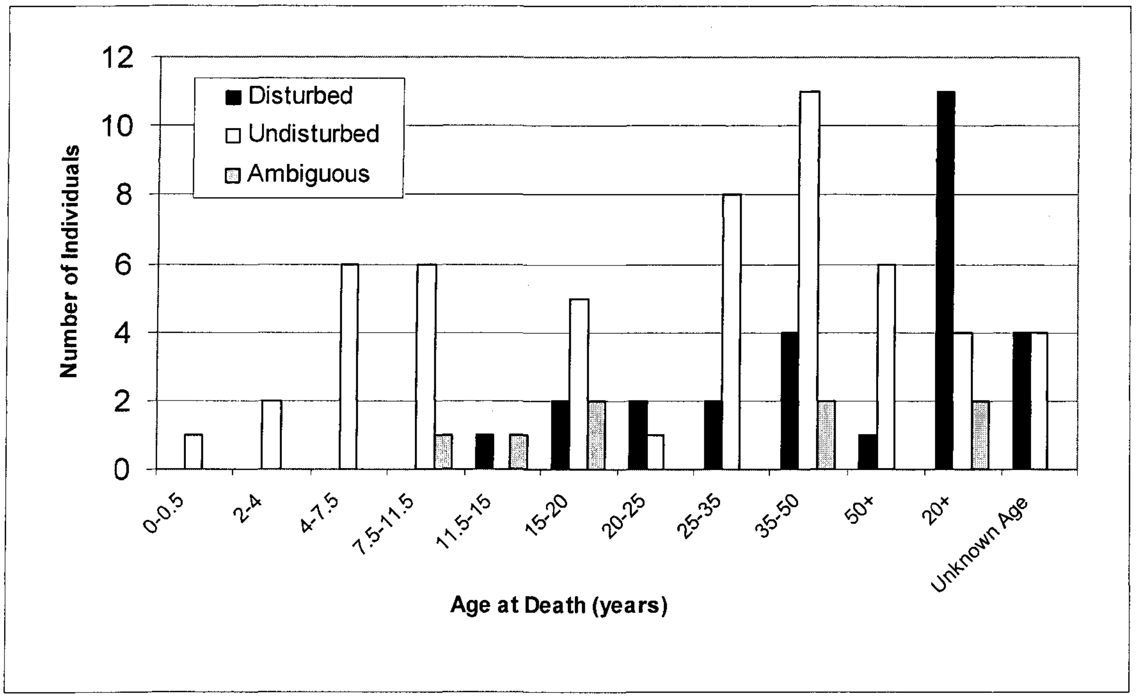

Figure 4.11: Age-at-death of individuals at Khuzhir-Nuge XIV, classified by level of grave disturbance (n=89)

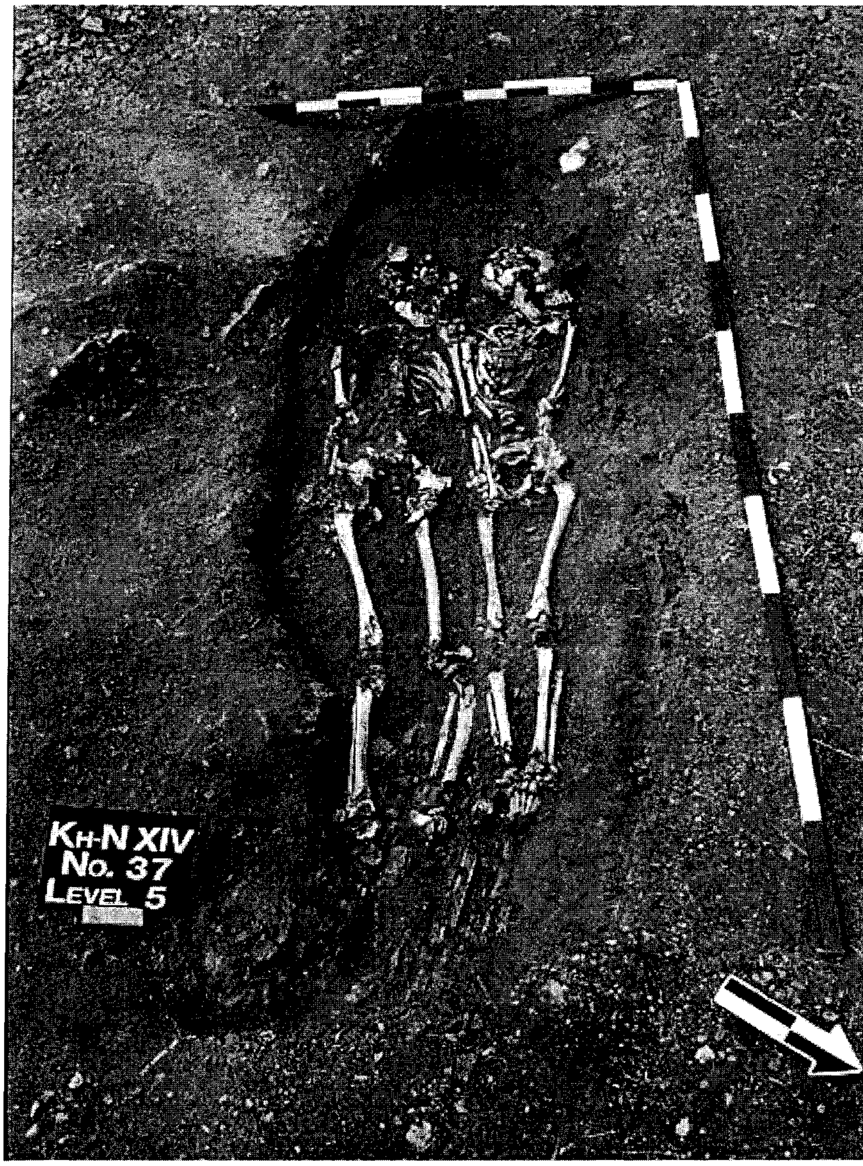

Figure 4.12: Example of side-by-side double burial from Khuzhir-Nuge XIV; photo A Weber

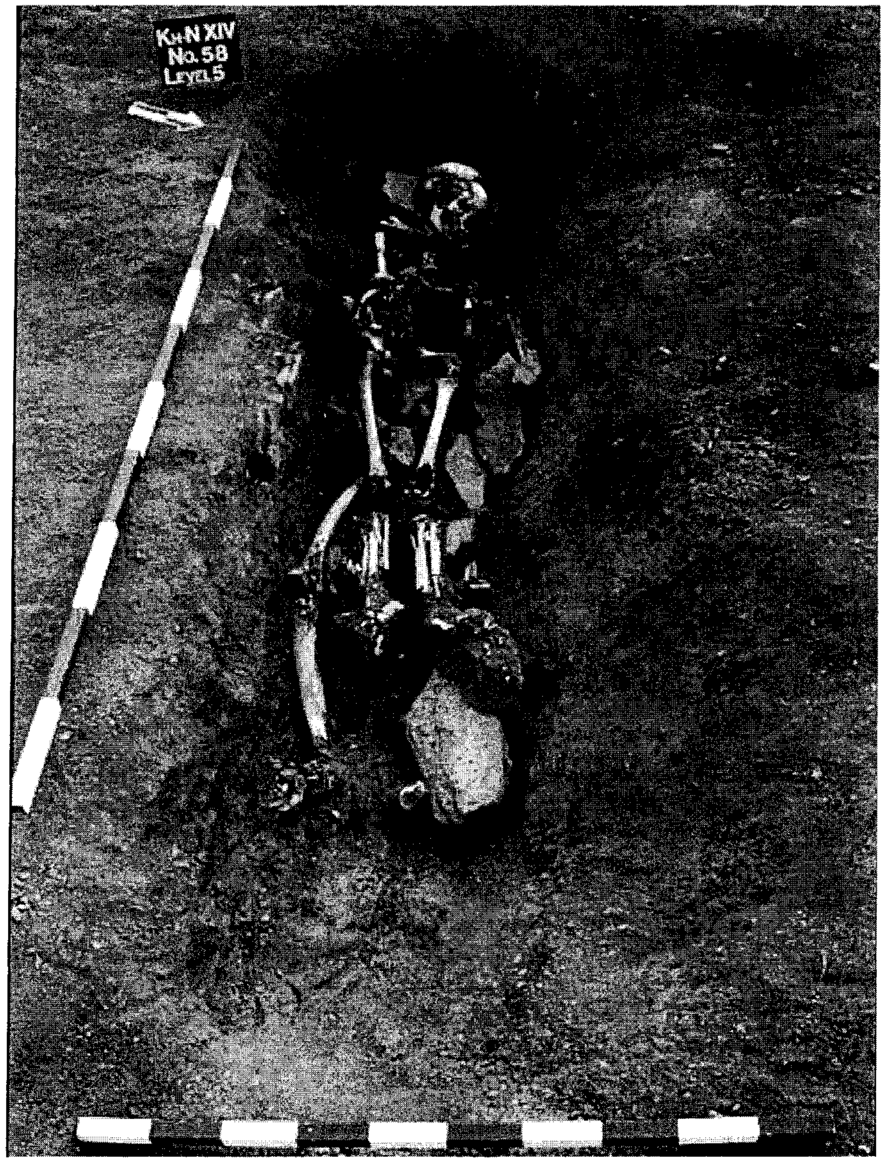

Figure 4.13: Example of a stacked double burial from Khuzhir-Nuge XIV; photo A Weber

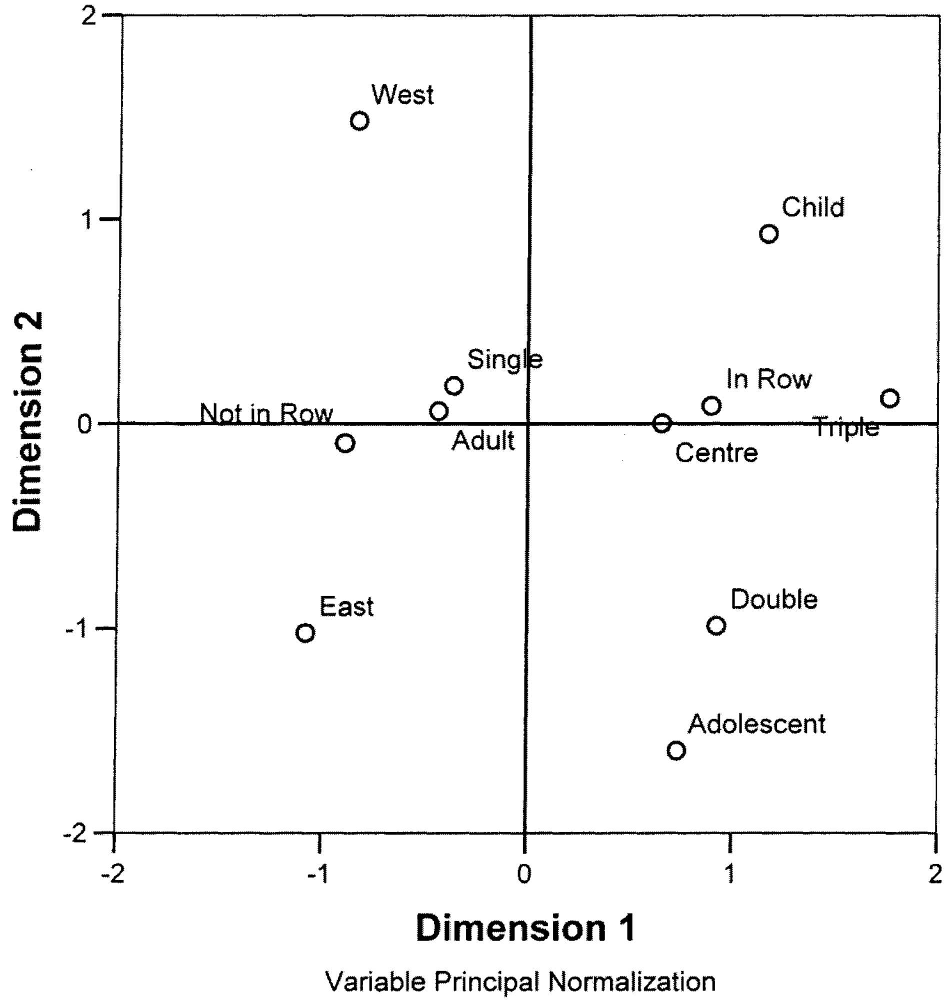

Figure 4.14: Multiple correspondence analysis map of spatial cluster, age-at-death, interment in rows, and grave type at Khuzhir-Nuge XIV

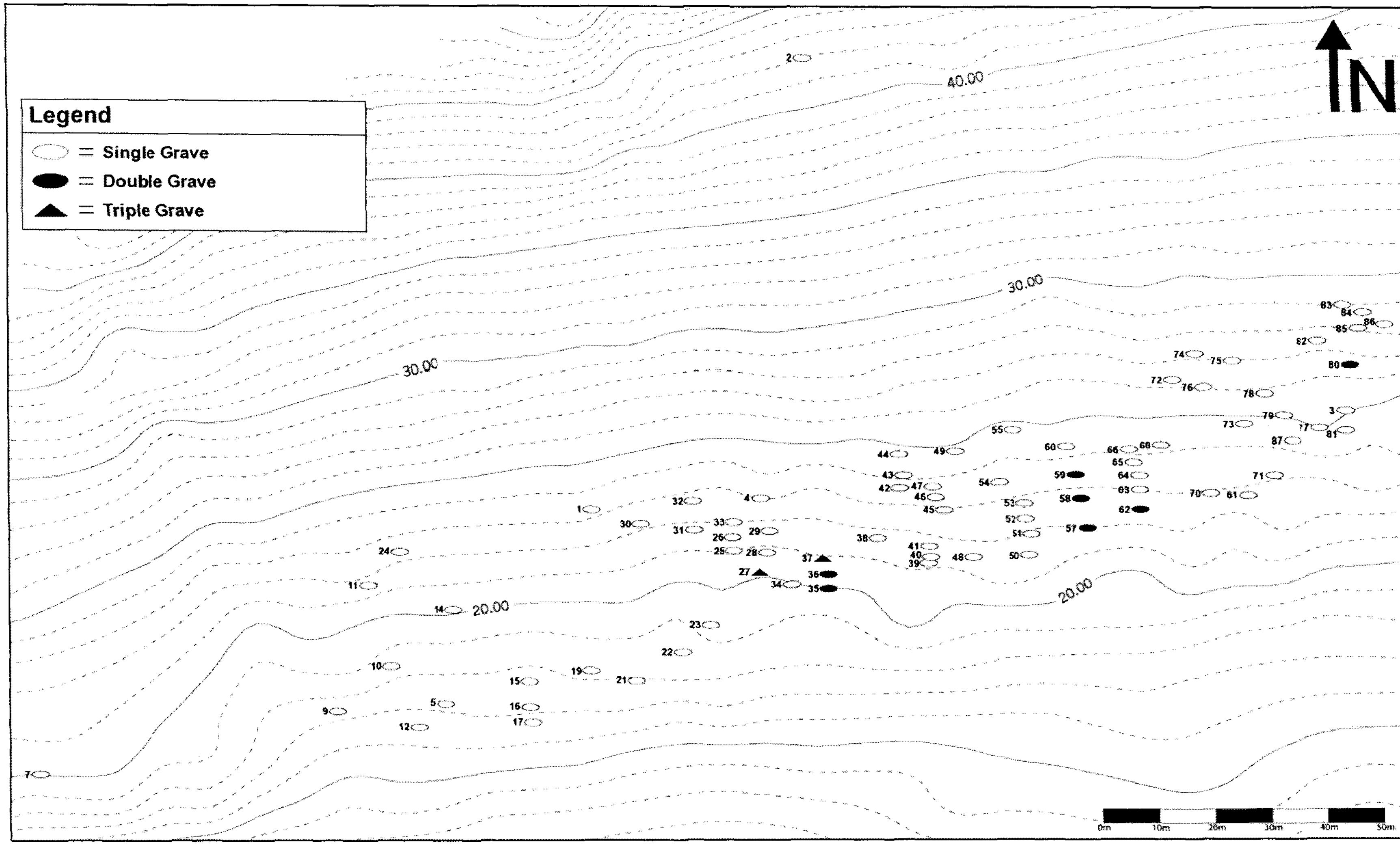

Figure 4.15: Spatial distribution of grave types at Khuzhir-Nuge XIV

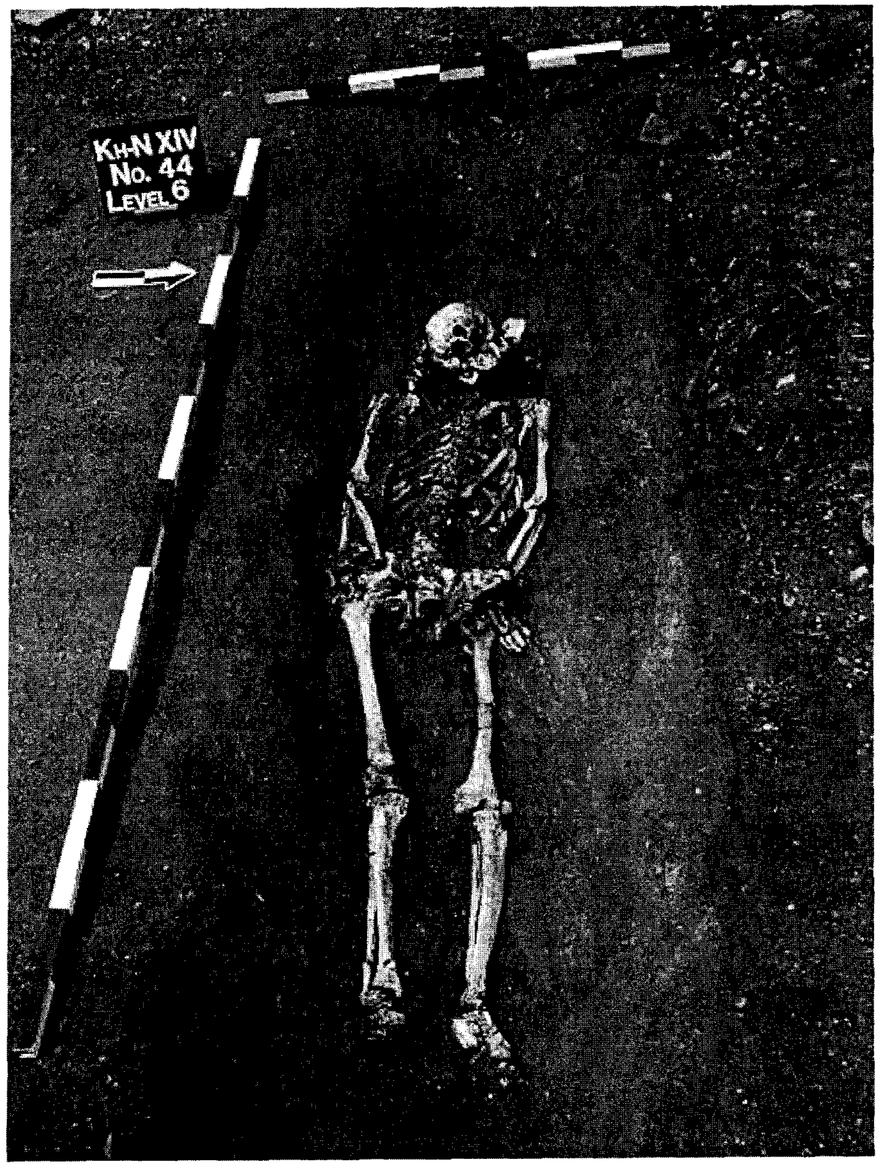

Figure 4.16: Example of a burial with a dislocated skull from Khuzhir-Nuge XIV; photo A Weber

Figure 4.17: Example of a fully cremated burial from Khuzhir-Nuge XIV; photo A Weber

Figure 4.18: Example of a partially cremated burial from Khuzhir-Nuge XIV; photo A Weber

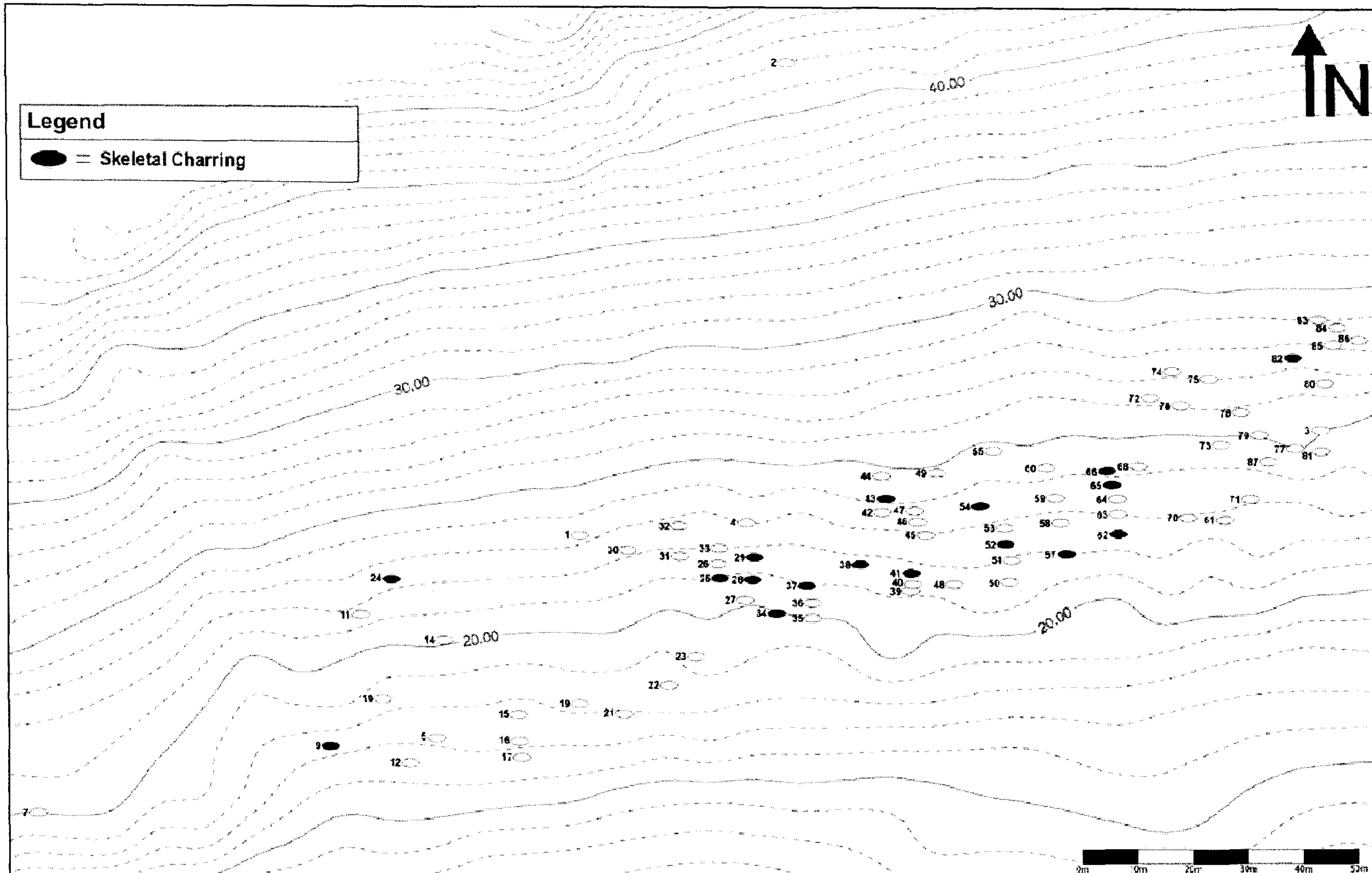

Figure 4.19: Spatial distribution of skeletal charring at Khuzhir-Nuge XIV

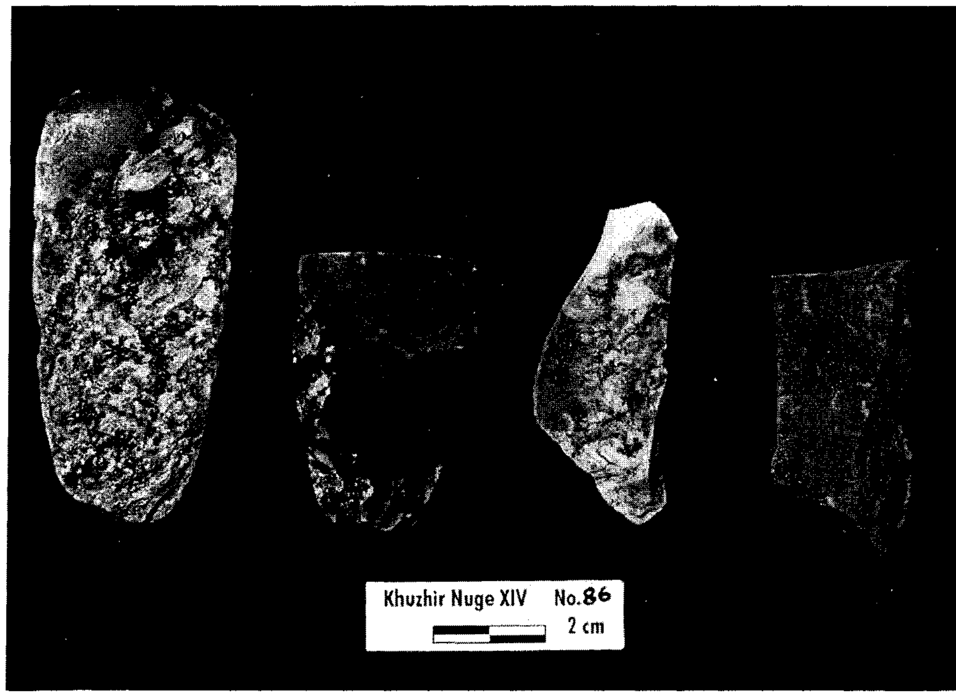

Figure 4.20: Examples of two nephrite axes (on left) from Grave No 86 at Khuzhir-Nuge XIV; photo A Weber

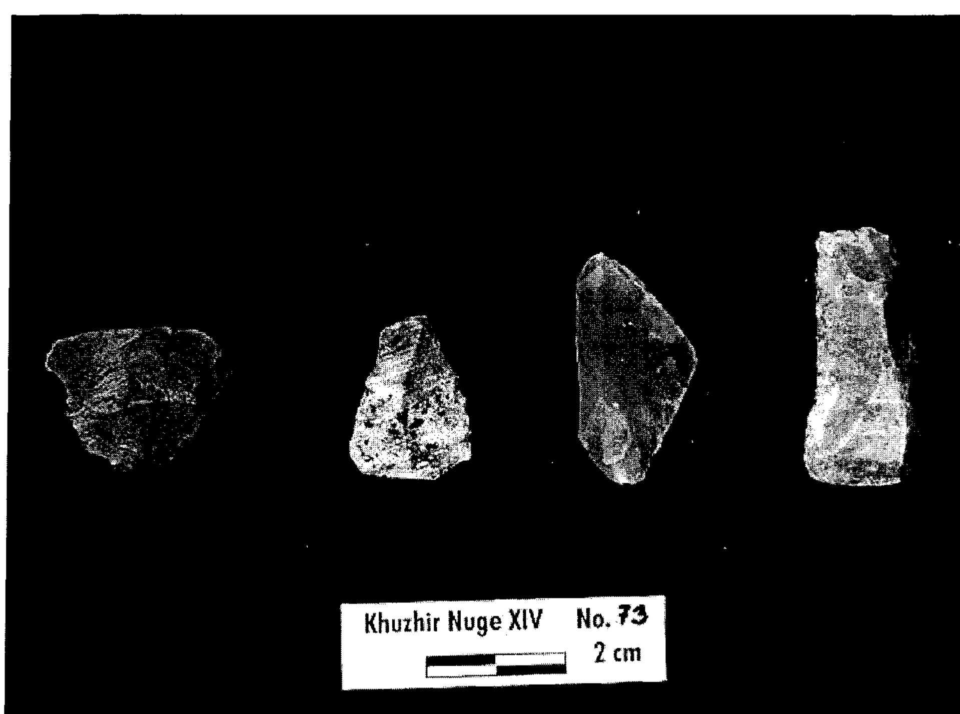

Figure 4.21: Examples of 1 nephrite knife (second from right) from Grave No 73 at Khuzhir-Nuge XIV; photo A Weber

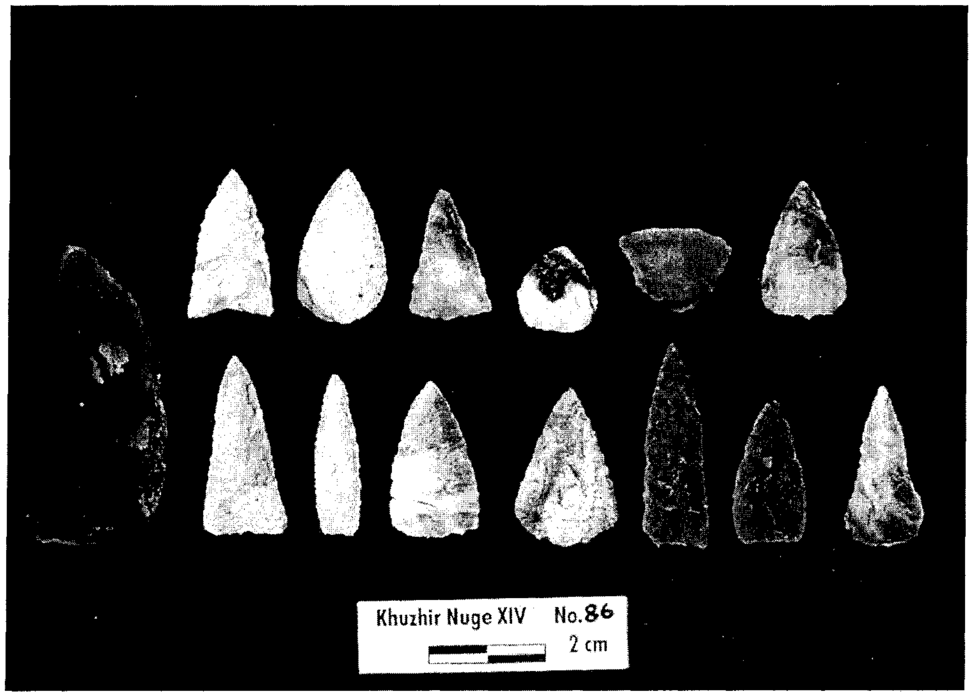

Figure 4.22: Examples of lithic arrowheads from Grave No 86 at Khuzhir-Nuge XIV; photo A Weber

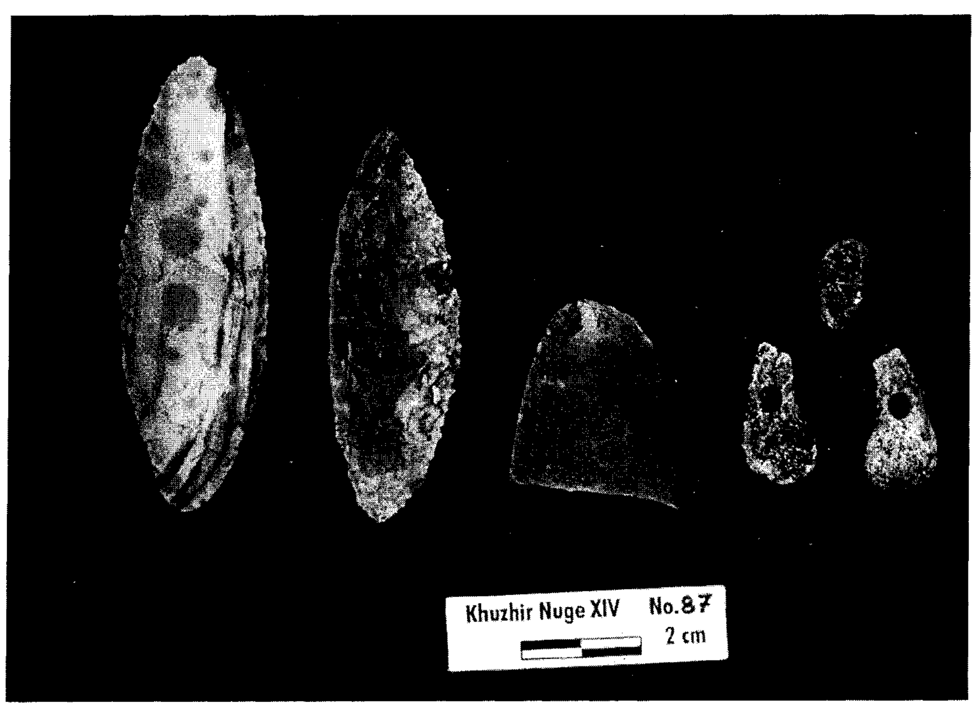

Figure 4.23: Examples of two lanceolate bifaces (on left) from Grave No 87 at Khuzhir-Nuge XIV; photo A Weber

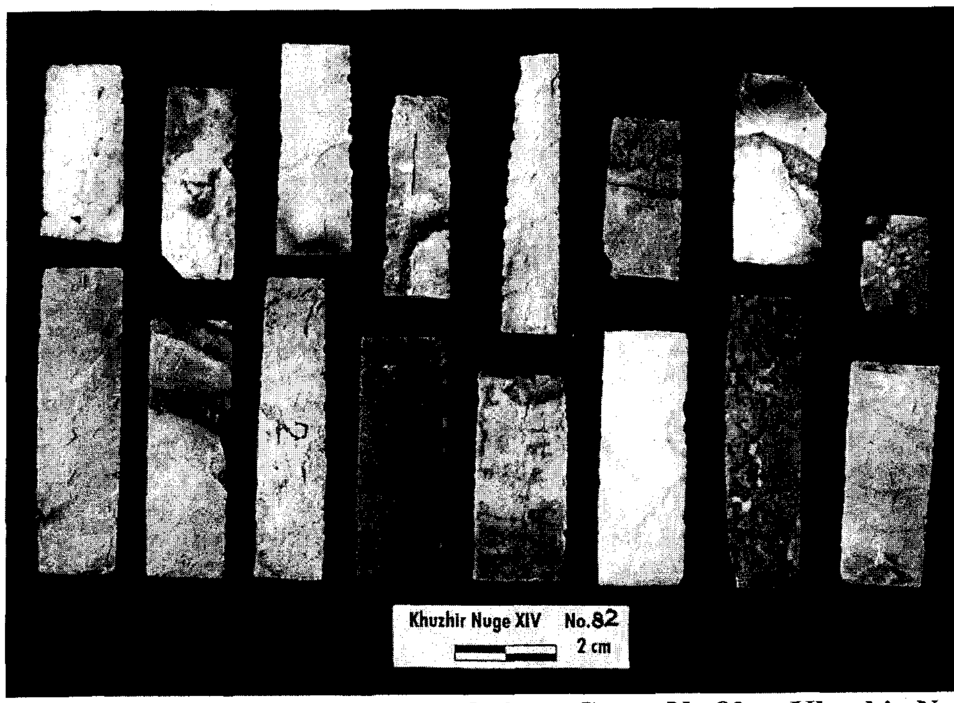

Figure 4.24: Examples of lithic insert tools from Grave No 82 at Khuzhir-Nuge XIV; photo A Weber

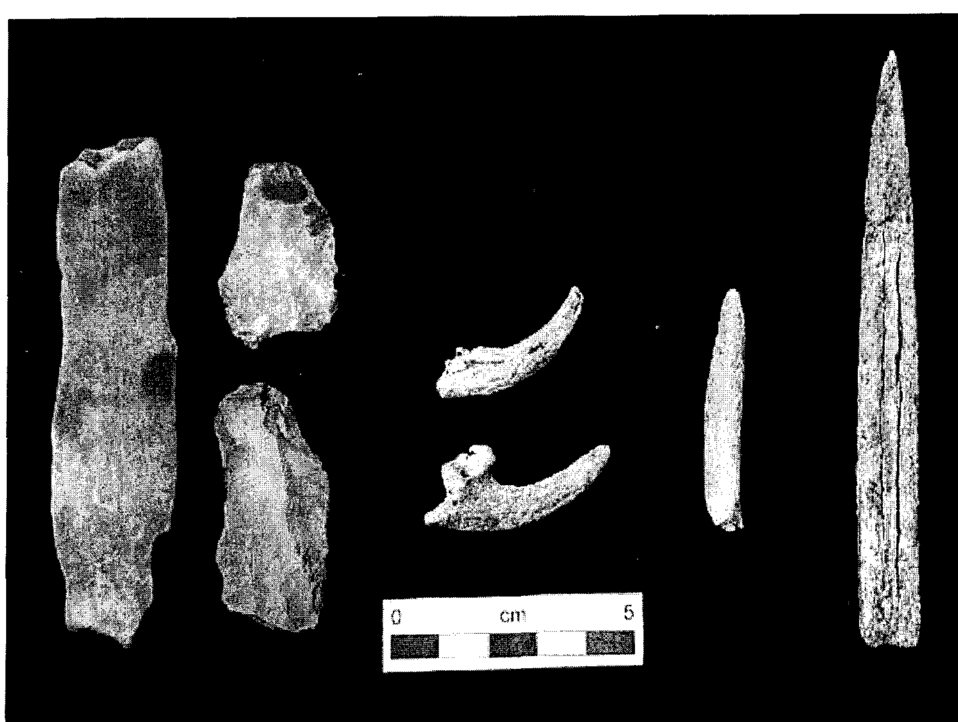

Figure 4.25: Example of two bone points (at right) from Grave No 14 at Khuzhir-Nuge XIV; photo A Weber

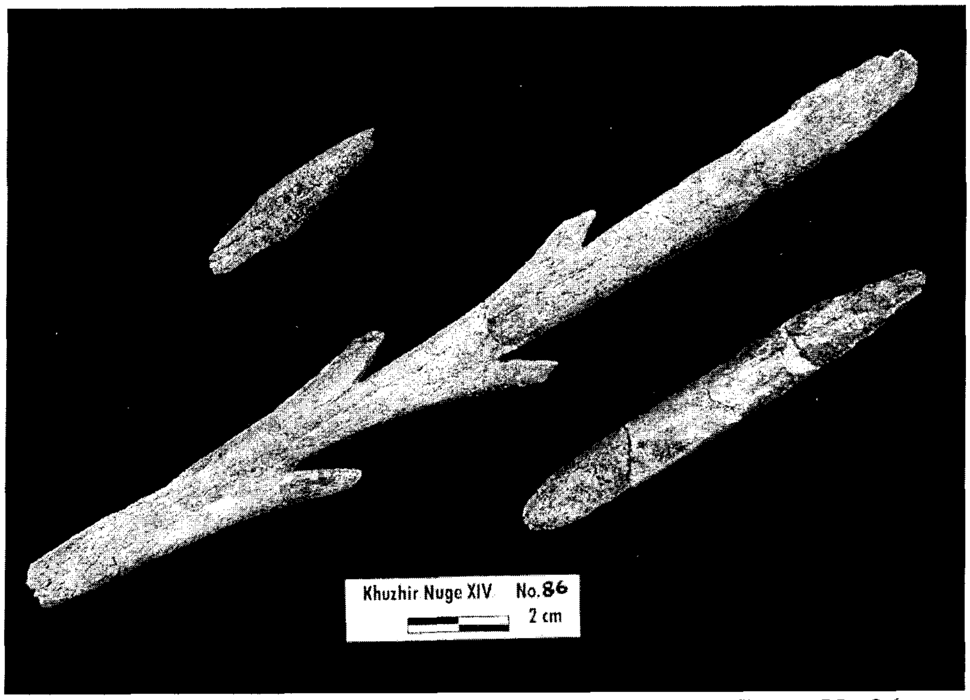

Figure 4.26: Example of bone/antler harpoon (centre) from Grave No 86 at Khuzhir-Nuge XIV; photo A Weber

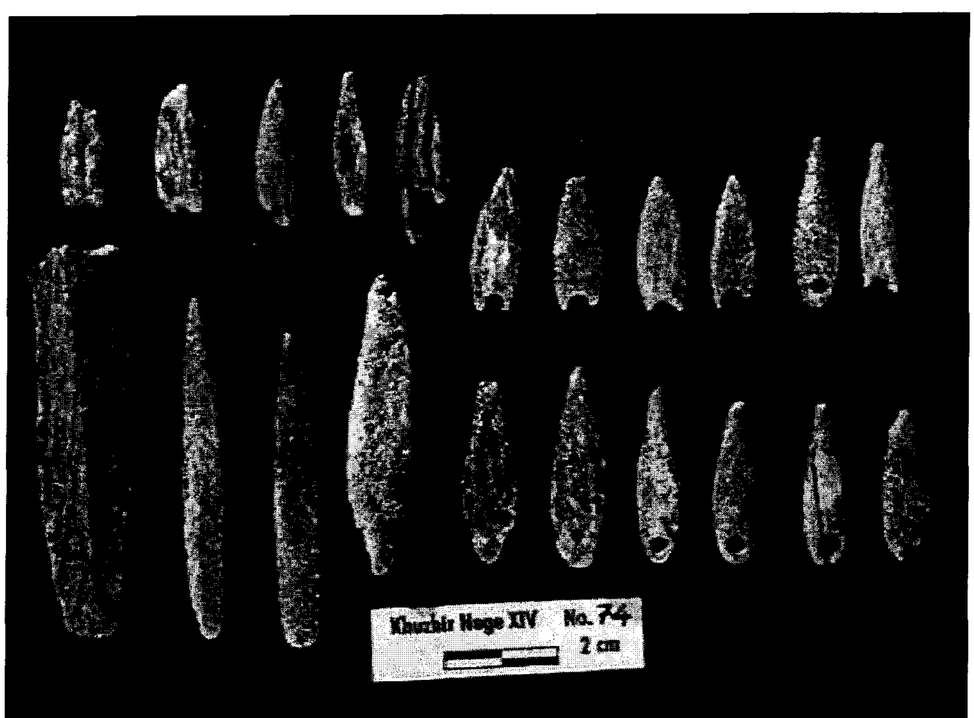

Figure 4.27: Example of bone/antler fishhook shanks (at right) from Grave No 74 at Khuzhir-Nuge XIV; photo A Weber

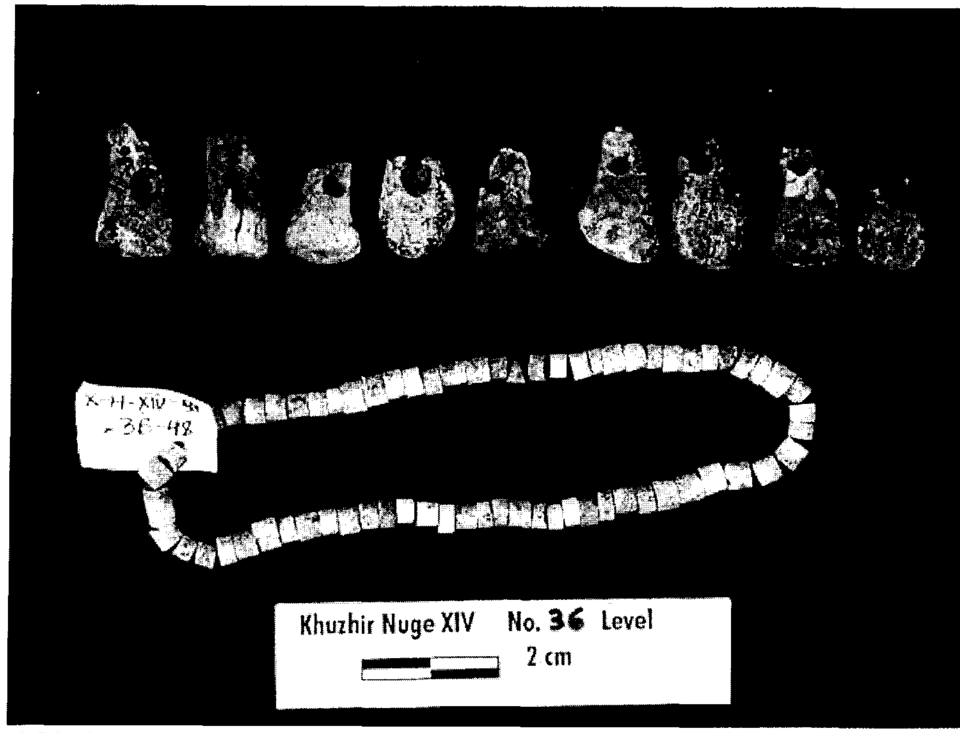

Figure 4.28: Example of cylindrical beads and red deer canine pendants from Grave No 36 at Khuzhir-Nuge XIV; photo A Weber

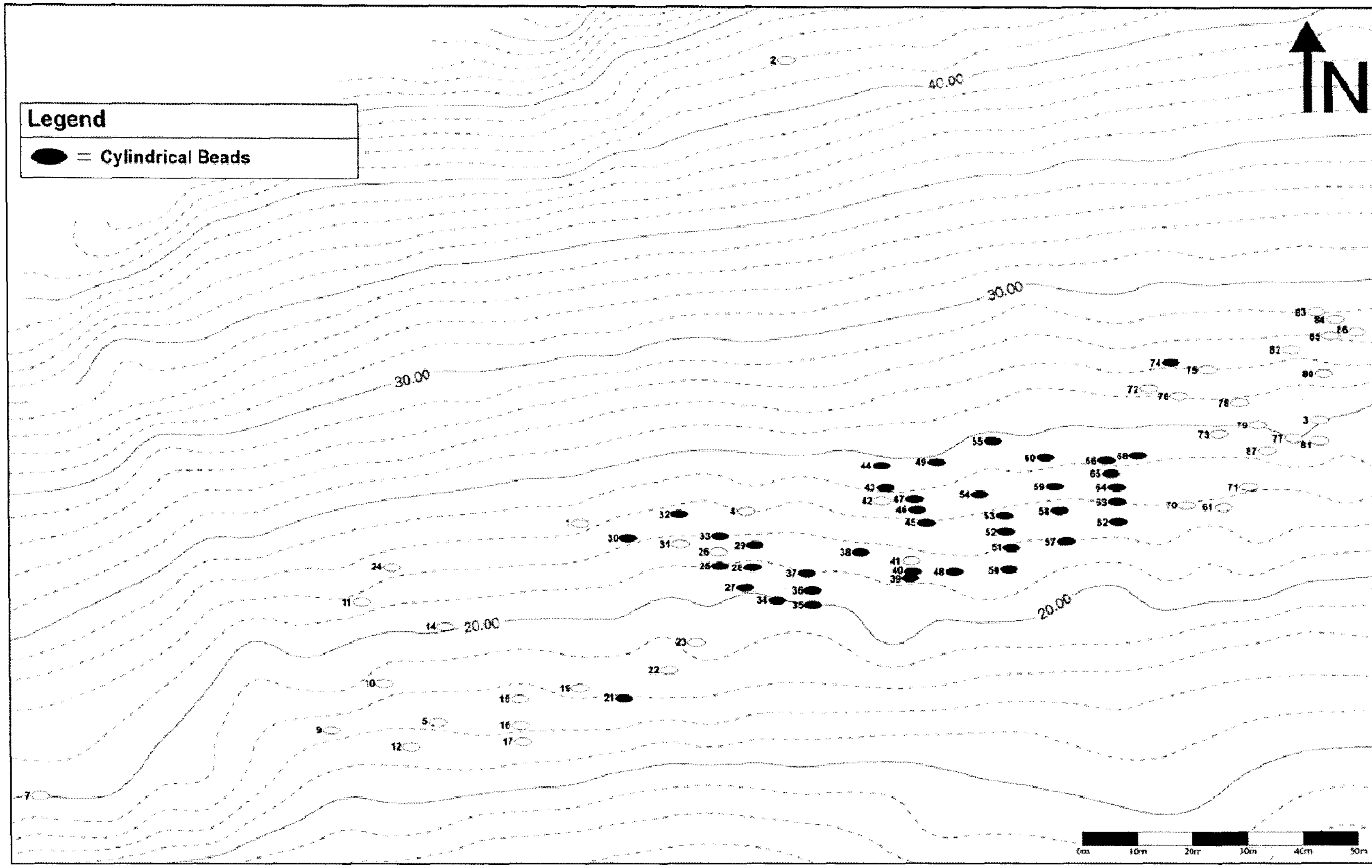

Figure 4.29: Spatial distribution of cylindrical beads at Khuzhir-Nuge XIV

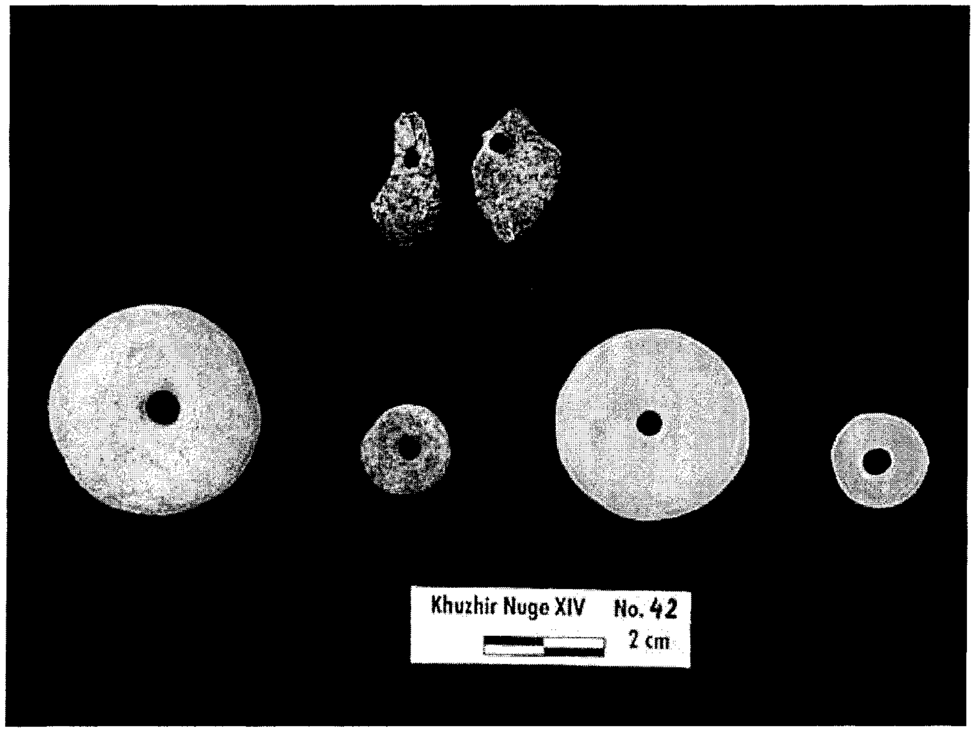

Figure 4.30: Ground stone discs from Grave No 42 at Khuzhir-Nuge XIV; photo A Weber

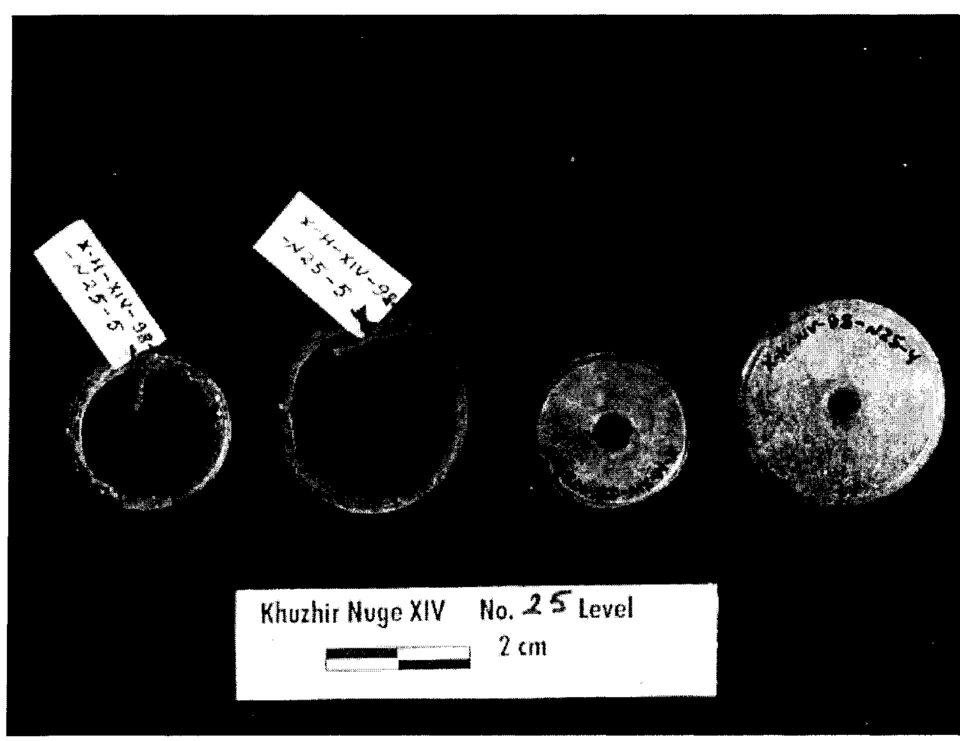

Figure 4.31: Metal rings and Nephrite discs from Grave No 25 at Khuzhir-Nuge XIV; photo A Weber

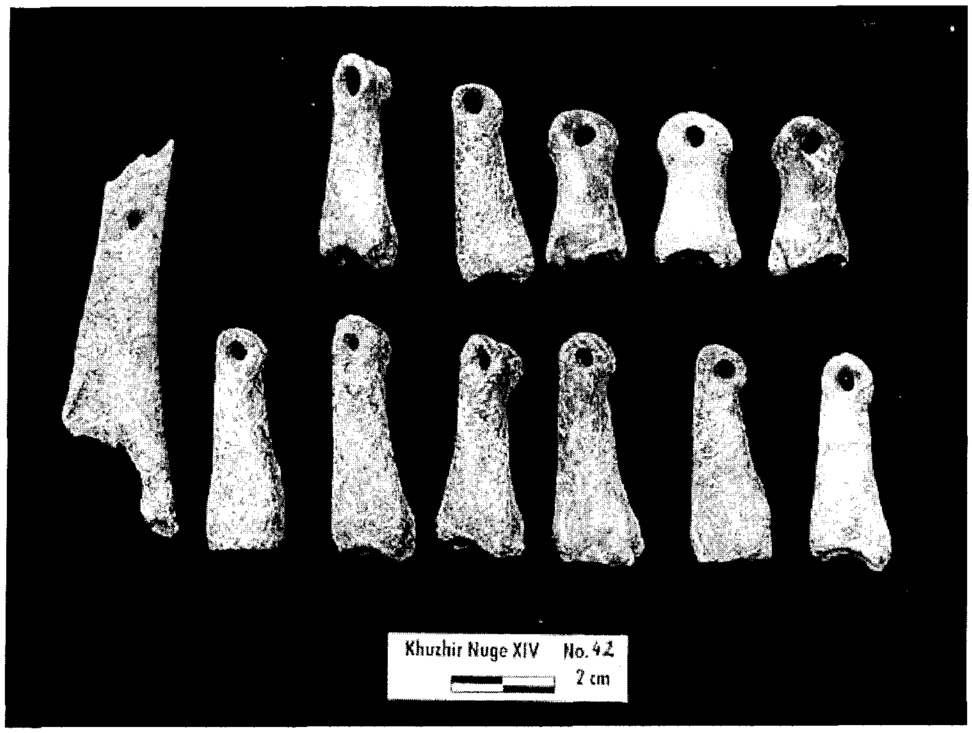

Figure 4.32: Perforated roe deer phalanges from Grave No 42 at Khuzhir-Nuge XIV; photo A Weber

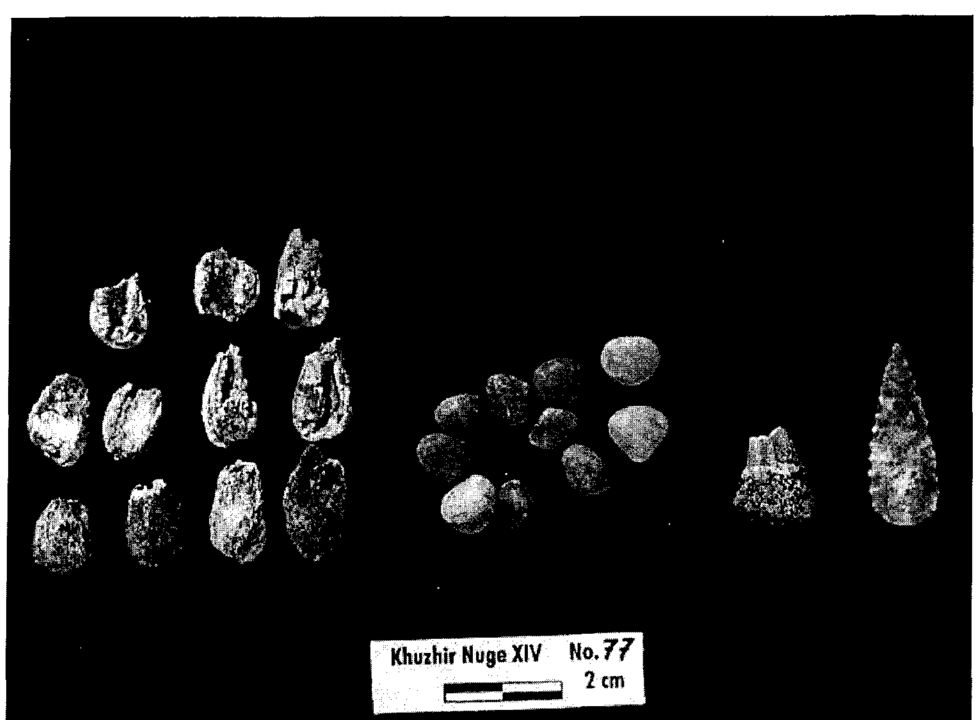

Figure 4.33: Round pebbles (centre) from Grave No 77 at Khuzhir-Nuge XIV; photo A Weber

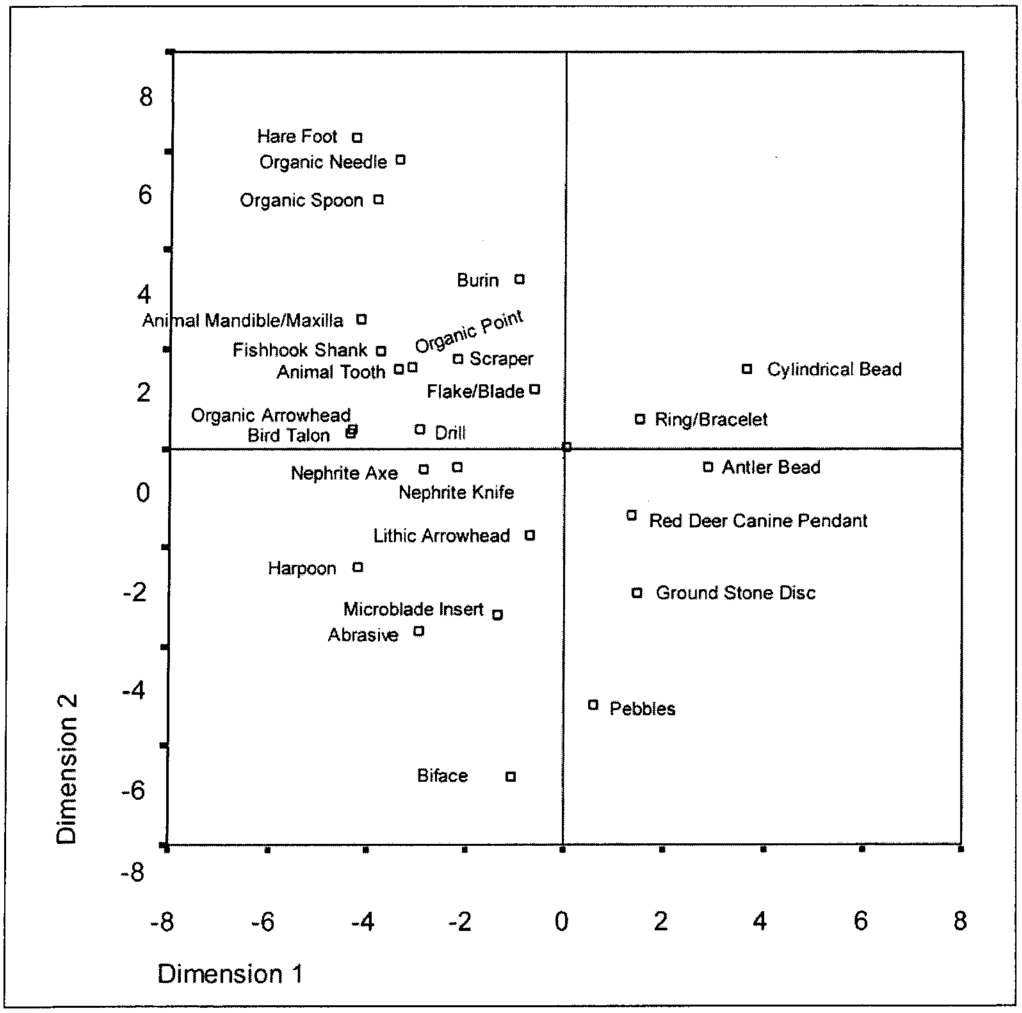

Figure 4.34: Multiple correspondence analysis map of major artifact types at Khuzhir-Nuge XIV

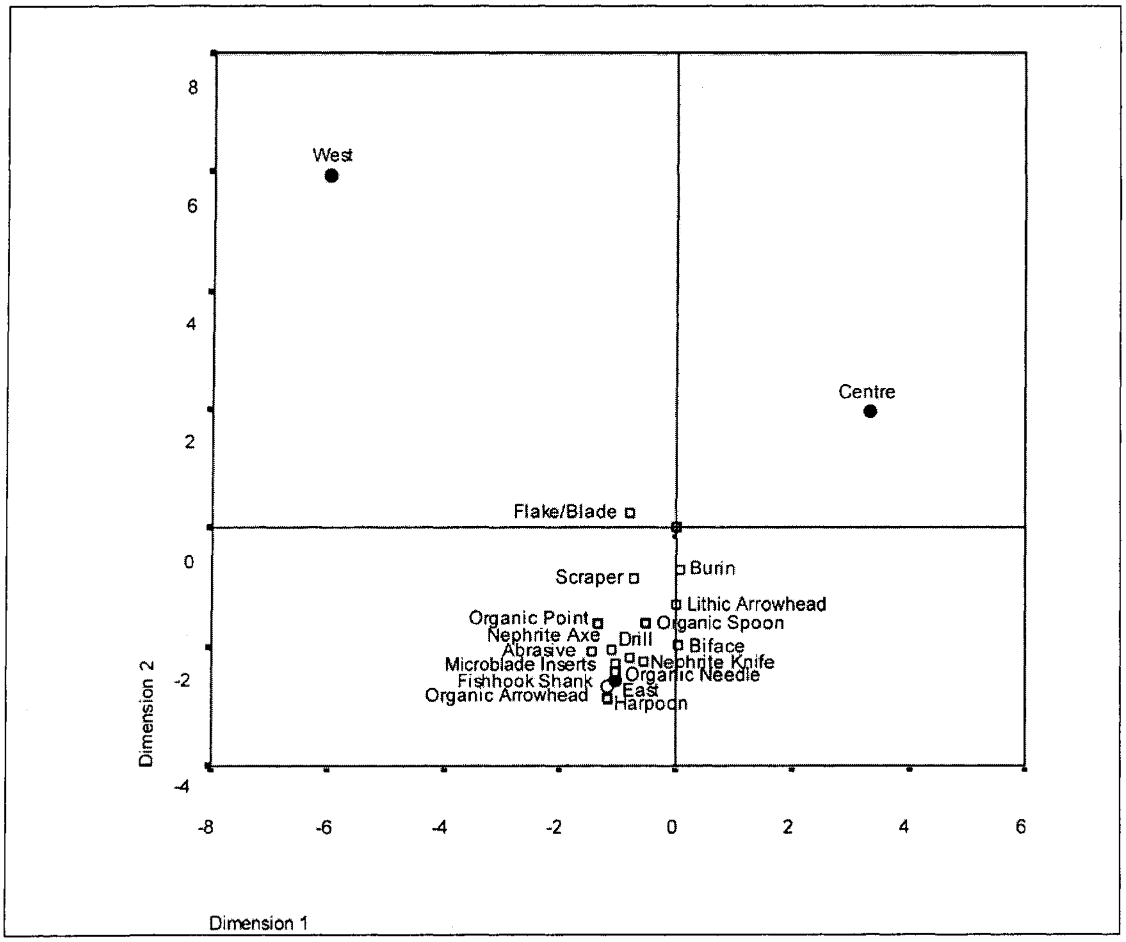

Figure 4.35: Multiple correspondence analysis map of implements and spatial cluster at Khuzhir-Nuge XIV

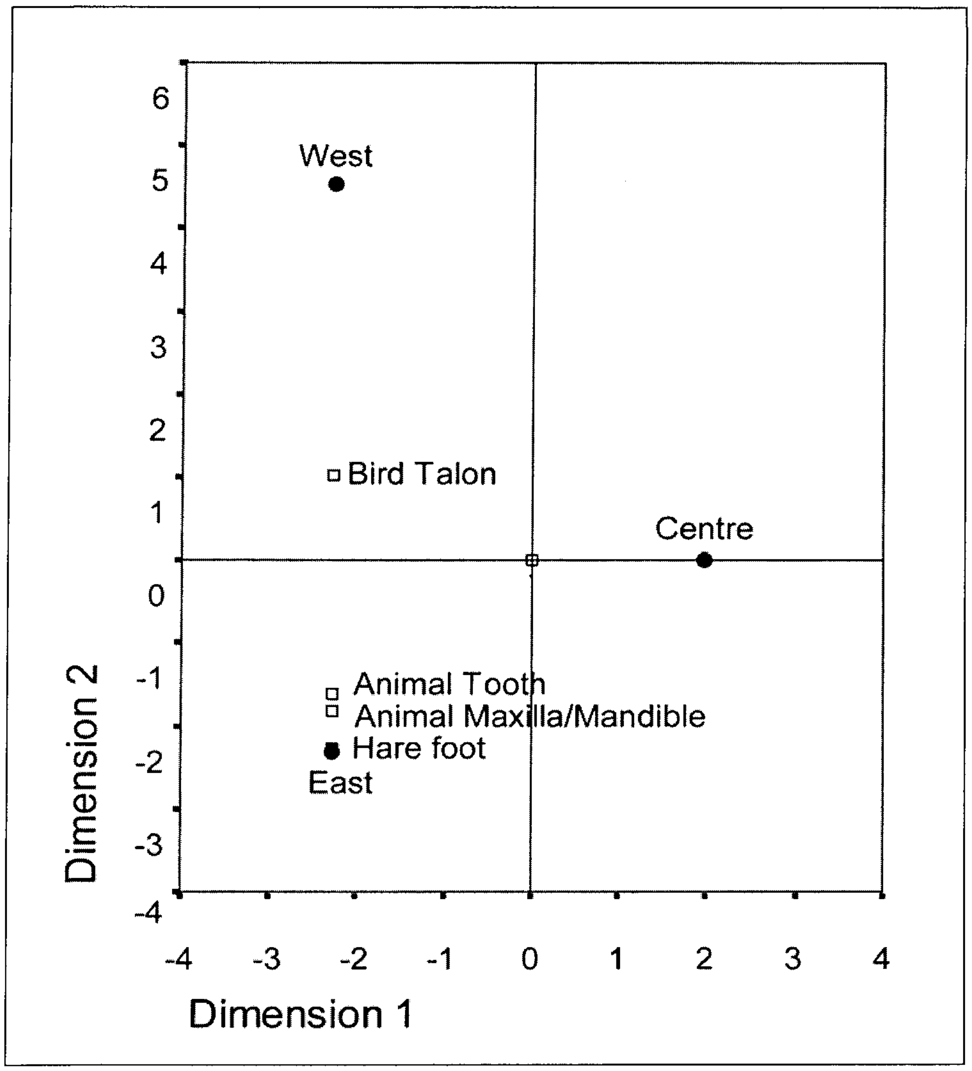

Figure 4.36: Multiple correspondence analysis of unmodified animal remains and spatial cluster at Khuzhir-Nuge XIV

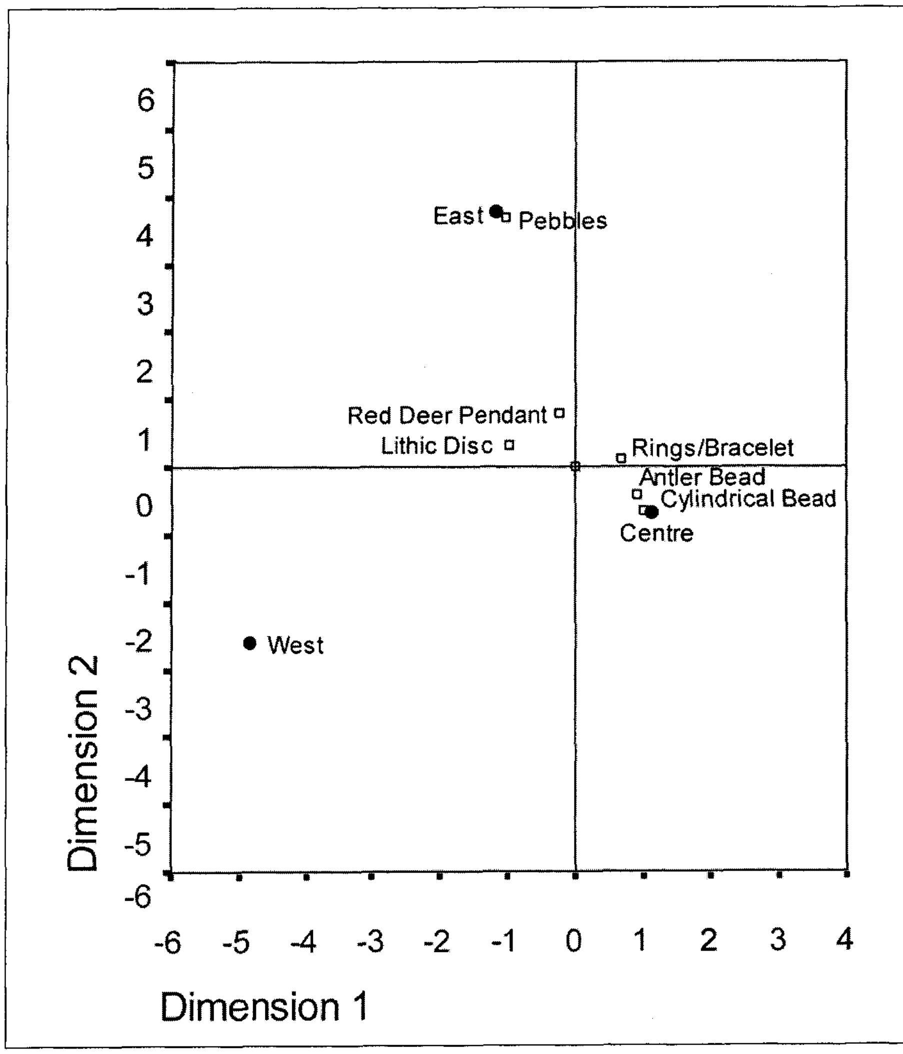

Figure 4.37: Multiple correspondence analysis map of ornaments and spatial cluster at Khuzhir-Nuge XIV

Table 4.1: Binomial Tests of simulated numbers of males and females at Khuzhir-Nuge XIV

	# Glazkovo Individuals	Observed Proportion	Test Proportion	Significance (2-tailed) *
Male	40	0.63	0.50	0.043
Female	23	0.37		
Totals	63	1.00		
Male	39	0.62	0.50	0.077
Female	24	0.38		
Totals	63	1.00		
Male	38	0.60	0.50	0.130
Female	25	0.40		
Totals	63	1.00		

*. Based on Z Approximation

Table 4.2: Age at death by culture group at Khuzhir-Nuge XIV

Culture Group	Neonate (<1 yr)	Subadult (<12)	Adolescent (12–20)	Young–Young Adult (20–25)	Young Adult (25–35)	Middle Adult (35–50)	Old Adult (50+)	Adult (20+)	Unknown Age	Totals
				Frequency						
Glazkovo	1	15	11	3	10	17	7	17	7	88
Serovo	0	0	0	0	1	0	0	0	0	1
Totals	1	15	11	3	11	17	7	17	7	89
				Row %						
Glazkovo	1.1	17.0	12.5	3.4	11.4	19.3	8.0	19.3	8.0	100.0
Serovo	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0
Totals	1.1	16.9	12.4	3.4	12.4	19.1	7.9	19.1	7.9	100.0
				Column %						
Glazkovo	100.0	100.0	100.0	100.0	90.9	100.0	100.0	100.0	100.0	98.9
Serovo	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	1.1
Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.3: Results of two-tailed Fisher Exact Test for the distributions of Glazkovo adults (>20 y.o.), adolescents (12–20 y.o.), children (<12 y.o.) and subadults (<20 y.o.) across the three main burial clusters at Khuzhir-Nuge XIV (W=West, C=Centre, E=East)

	W–C–E	W–C	W–E	C–E	(W+C)–E	(W+E)–C	(C+E)–W
Adult–Children	0.009	0.301	0.192	0.006	0.015	0.009	0.718
Adult–Adolescent	0.262	0.169	0.279	0.728	1.00	0.201	0.187
Adolescent–Children	0.030	0.536	0.100	0.072	0.056	0.370	0.499
Adult–Children–Adolescent	0.017	0.145	0.095	0.012	0.023	0.013	0.274
Adult–Subadult	0.023	0.062	1.000	0.029	0.015	0.009	0.718

Table 4.4: Results of two-tailed Fisher Exact Test for the spatial and demographic distributions of Grave Types at Khuzhir-Nuge XIV (W=West, C=Centre, E=East)

	Single–Double–Triple	Single–Multiple
Adult–Children	0.027	0.072
Adult–Adolescent	0.023	0.035
Adolescent–Children	0.868	0.710
Adult–Children–Adolescent	0.019	0.028
Adult–Subadult	0.010	0.013
W–C–E	0.442	0.140
W–C	0.360	0.180
W–E	1.000	1.000
C–E	0.371	0.249
(W+C)–E	0.820	0.431
(W+E)–C	0.100	0.037
(C+E)–W	0.558	0.197
Rows vs Non-Row	0.002	0.009

Table 4.5: Summary of atypical cranial treatments at Khuzhir-Nuge XIV

Grave #	Skull Treatment	Interpretation	Age (years)	Sex
24	Missing Skull	Disturbance	20+	?
61	Missing Skull	Disturbance	20+	?
76	Missing Skull	Disturbance	20+	?
78	Missing Skull	Disturbance	20+	?
87	Missing Skull	Disturbance	35–50	Male
41	Missing Skull	Preservation?	?	?
21	Missing Skull	Preservation?	20+	?
75	Missing Skull	Preservation/Disturbance?	20+	?
83	Missing Skull	Preservation/Disturbance?	20+	?
84	Missing Skull	Preservation/Disturbance?	13–19	?
85	Missing Skull	Preservation/Disturbance?	20+	?
16	Disarticulated	Secondary Treatment	7–9	?
38	Disarticulated	Secondary Treatment	35–50	Male
44	Disarticulated	Secondary Treatment	35–50	Male
51	Disarticulated	Secondary Treatment	18–20	Male
53	Disarticulated	Secondary/Disturbance?	35–50	Male
59.2	Disarticulated	Secondary/Disturbance?	18–20	Male
63	Disarticulated	Secondary/Disturbance?	16–18	?
80.2	Disarticulated	Secondary/Disturbance?	50+	Male
77	Mandible w/post-cranial	Secondary Treatment?	12–15	?
58.2	Mandible w/post-cranial	Disturbance?	35–50	Male
74	Mandible w/post-cranial	Disturbance	25–35	Male
71	Teeth w/post-cranial	Disturbance	12–15	?
73	Teeth w/post-cranial	Disturbance	20+	?
81	Teeth w/post-cranial	Disturbance	35–50	Male
82	Teeth w/post-cranial	Disturbance	20–25	?
86	Teeth w/post-cranial	Disturbance	20–25	?
59.1	Cranium Only	Secondary Treatment	35–50	?
80.1	Cranium Only	Secondary Treatment	?	?
26	Cranium Only	Secondary Treatment	4–6	?
42	Mandible Only	Secondary Treatment	50+	?

Table 4.6: Results of two-tailed Fisher Exact Test for the spatial and demographic distributions of skeletal charring at Khuzhir-Nuge XIV

	Charred Burials	Graves Containing Charred Burials	Charred Burials from the Centre Cluster
Adult–Children	0.329	n/a	0.156
Adult–Adolescent	1.000	n/a	1.000
Adolescent–Children	0.370	n/a	0.297
Adult–Children–Adolescent	0.582	n/a	0.257
Adult–Subadult	0.582	n/a	0.229
W–C–E	0.024	0.067	n/a
W–C	0.318	0.487	n/a
W–E	0.551	0.551	n/a
C–E	0.015	0.030	n/a
(W+C)–E	0.034	0.059	n/a
(W+E)–C	0.010	0.031	n/a
(C+E)–W	0.509	1.000	n/a
Rows vs Non-Row	0.045	0.175	1.000
Grave Type (Single–Multiple)	0.378	0.405	1.000

Table 4.7: **Summary of statistically significant results of two-tailed Fisher's Exact Test ($p<0.05$) for the association of artifacts with various mortuary attributes at Khuzhir-Nuge XIV (black=significant; W=West, C=Centre, E=East, N=North)**

	Nephrite Axe	Nephrite Knife	Abrader	Lithic Arrowhead	Scraper	Biface	Flakes/Blades	Organic Points	Cylindrical Beads	Red Deer Canine Pendants	Any Implement	Any Ornament
Adult–Adolescent–Child				■			■				■	
Adult–Subadult								■				
Adult–Child				■			■				■	
Adult–Adolescent												
Adolescent–Child				■			■				■	
W–E–C–N Clusters (burials)	■	■	■	■	■			■	■		■	■
W–E–C Clusters (burials)	■	■	■	■				■	■		■	■
W–C Clusters (burials)									■			■
W–E Clusters (burials)											■	■
C–E Clusters (burials)	■	■	■	■	■			■	■		■	■
(W+C)–E Clusters (burials)	■	■	■	■	■	■		■	■		■	
(W+E)–C Clusters (burials)	■		■	■			■	■	■		■	■
(C+E)–W Clusters (burials)									■			■
W–E–C–N Clusters (graves)	■	■	■	■	■			■	■		■	■
W–E–C Clusters (graves)	■	■	■	■				■	■		■	■
W–C Clusters (graves)									■			■
W–E Clusters (graves)				■							■	■
C–E Clusters (graves)	■	■	■	■				■	■		■	■
(W+C)–E Clusters (graves)	■	■	■	■	■	■		■	■		■	
(W+E)–C Clusters (graves)	■	■	■					■	■		■	■
(C+E)–W Clusters (graves)									■			■
Interment in Rows (burials)	■						■	■	■		■	■
Interment in Rows (graves)	■	■						■	■		■	■
Grave Type: Single–Multiple (burials)											■	
Grave Type: Single–Multiple (graves)									■	■		
Skeletal Charring (burials)									■			
Skeletal Charring (graves)									■			

Chapter 5
Bronze Age Mortuary Variability in the Little Sea Microregion

In the previous two chapters, I demonstrated that the Bronze Age cemetery Khuzhir-Nuge XIV (KN XIV) was divided into three well-defined spatial clusters that were created and maintained through the reproduction of enduring social practices over a period of approximately 340–660 years. I further suggested that the three spatial clusters could not be understood as signifying a single dimension of variability, but rather that they encoded multiple social distinctions including, at least, age at death, status, and group affiliation. I also noted, however, that this interpretation must be evaluated against evidence from other Bronze Age mortuary sites in the surrounding area. This being the case, it is now necessary to expand the scale of analysis to consider the place of KN XIV within its regional context.

The evaluation of radiocarbon dates conducted in Chapter 3 demonstrated that at least five other mortuary sites in the Little Sea microregion were contemporary with KN XIV, and typological assessments suggest that another 14 sites in the area also date to the Bronze Age (Figure 5.1, Table 5.1). For the most part, the extent to which these sites resemble each other has been addressed only in culture-historical terms, and existing discussions of Little Sea mortuary variability tend to concentrate instead on assigning individual graves to particular mortuary traditions (e.g., Goriunova 1997, 2002; Goriunova and Khlobystin 1992; Goriunova et al. 2004; Kharinskii and Sosnovskaia 2000; Kharinskii and Turkin 2004). By treating graves rather than sites as the primary unit of analysis, such approaches are unable to consider cemeteries as meaningful places maintaining both intra- and intersite relationships that are associated with a broad range of social, political, economic and philosophical considerations (Carr 1995). Consequently, we currently have a poor understanding of the contexts within which Bronze Age mortuary sites were used and even the scale of the social unit using them. In particular, it is unclear whether individual mortuary sites in the Little Sea area represent the burial grounds of single, local Bronze Age communities—as is assumed for KN XIV based on the demographic profile—or whether individual communities used multiple cemeteries to inter smaller social units such as households, lineages, status groups, or individuals? The goal of this chapter, then, is to determine to what extent the structure of local mortuary variability observed at Khuzhir-Nuge XIV is evident at other Bronze Age mortuary sites in the Little Sea microregion. The results of this analysis are then used in this dissertation's final analytical chapter (Chapter 6) to explore the nature of the relationships between these sites and how they may have been articulated within a dynamic cultural landscape.

Owing to the current status of the publication record, however, the survey presented here has limits. In fact, only a single Bronze Age mortuary site (Uliarba) has been excavated and published in a manner to allow for systematic analysis comparable to that conducted at KN XIV. Even at this site the sample size is such that statistical methods are generally inappropriate. Most of the other sites discussed in this chapter have seen limited or no excavation, with results that have either never been published or have been presented only in summary form—often in conference proceedings that have small print runs and only local circulation. Goriunova and Svinin (1995, 1996, 2000) have performed a valuable service to the Baikal research community by presenting a catalogue of all known archaeological sites in the Little Sea microregion, including material only available from unpublished reports; however, the level of detail they could provide in such a format was necessarily restricted, and the accounts range from only a few sentences to a few pages. Nevertheless, the data available do provide a reasonable foundation upon which to begin the process of documenting regional variability.

Given that none of this material has been published in English, and that the source literature is generally unavailable outside of Siberia, each site is described here. In the case of small cemeteries, this was best accomplished by describing each grave individually in the text, while for larger sites with more detailed information it was most efficient to collate the data in tables and only discuss general relationships or particularly unusual cases in the text. Having said that, the intent of this analysis is not simply to translate or duplicate existing descriptions, but to compare variability at these sites with that observed at KN XIV. As such, whenever possible I will examine the structure of mortuary activities at these sites by using the same categories of variation previously employed in the analysis of KN XIV (i.e., spatial organization, demography, feature level, burial level, and grave inclusions level). Therefore, unless there are unusual specific cases, I will not provide exact details on such generally uniform variables as paving or pit size, but I will provide general information on such attributes for the site as a whole when it is available.

Before describing these sites, however, it is necessary to briefly introduce some additional background on existing culture-history models for the Little Sea microregion, which differ in certain respects from the general regional model introduced in Chapter 2.

5.1 LITTLE SEA CULTURE HISTORY

While the culture history for the Little Sea microregion generally follows that of the Cis-Baikal as a whole (see discussion in Chapter 2), both Goriunova (1997, 2002; Goriunova et al. 2004) and Kharinskii (Kharinskii and Sosnovskaia 2000; Turkin and Kharinskii 2004)[1] have proposed more detailed local schemes (Figure 5.2).

Although this study focuses on Bronze Age material, it is necessary to mention briefly the Early Neolithic Kitoi since, as with the debate surrounding the culture-history for the Cis-Baikal in general, the timing of the Kitoi in the Little Sea area is also contentious. Kharinskii's model is broadly consistent with Weber's (1995, Weber et al. 2002) general model in that it locates the Kitoi within the Early Neolithic, although it expands both the Kitoi and Serovo to eliminate Weber's Middle Neolithic hiatus. It is difficult to determine whether Kharinskii doubts that such a hiatus in mortuary practices exists, or whether he is simply interpolating the presence of these groups on the basis of data from habitation sites. In contrast, Goriunova believes that the Kitoi and Serovo coexisted during the region's later Developed Neolithic (5500–4300 BP), which corresponds in time roughly with Weber's Late Neolithic and with Kharinskii's Late Neolithic/Early Bronze Age (Figure 5.2).

As documented in Chapter 3, Goriunova gives little credence to radiocarbon data from mortuary sites, and as a result her model is based primarily on typological, stratigraphic, and the few radiocarbon dates from habitation sites. In an evaluation of Goriunova's model, Weber et al. (n.d.) point out that radiocarbon dates from habitation sites are

[1] For simplicity, in the remainder of the text I will collectively refer to the models based on these publications as "Goriunova's Model" or Kharinskii's model".

almost certainly less reliable than those from mortuary sites, especially when collagen yields from the later contexts are considered in the analysis. In particular, they point out that dates on human bone from mortuary sites provide a fairly unambiguous association between the estimated date and the original behavioural event (i.e., the death and burial of the individual), while radiocarbon dates from habitation sites are typically performed on material such as faunal bones or charcoal that are not only more ambiguous in terms of their behavioural referent, but are also much more susceptible to the effects of various site formation processes[2]. As a result, the existing radiocarbon dates from habitation sites must be considered comparatively indirect and imprecise evidence of the timing of particular stratigraphic layers. Overall, then, these authors conclude that Goriunova's "preference for archaeological evidence from habitation sites over that of mortuary sites is unjustified" (Weber et al. n.d.). When we recall that the evaluation of radiocarbon dates conducted in Chapter 3 not only confirmed that the Kitoi were much earlier than the Serovo, but also suggested an expanded the time frame between these two groups, it seems warranted to put aside this component of Goriunova's model.

Goriunova and Kharinksii also differ with respect to the timing of the Serovo culture. As noted above, Kharinskii dates the Serovo earlier than do Goriunova or Weber, especially considering that Goriunova only accepts radiocarbon dates from Little Sea Serovo burials for the period between 4600–4300 BP. She refers to these graves as *Late Serovo* to distinguish them from earlier Serovo graves found in other Cis-Baikal microregions. Also, while Kharinskii and Weber both identify Serovo graves as dating to

[2] The majority of burials in Cis-Baikal are primary, and evaluation of skeletal articulation suggests that individuals were interred relatively soon after death. In other contexts, where significant time elapsed between death and interment, radiocarbon dating of human bone will not provide such a direct association with the final burial of the individual; however even in these cases the time elapsed is likely to be within the range of error of the radiocarbon method.

the *Late* Neolithic, Goriunova labels this period the *Developed* Neolithic. For Goriunova, the *Late Neolithic* in the Little Sea area is a more recent phenomenon (4200–4000 BP) and is known only from Level VIII at the stratified habitation site of Ulan-Khada. She emphasizes that "at present there is not enough data to associate any of the known graves from the Ol'khon region with the Late Neolithic complex (Goriunova 2003:30)." Although Goriunova never explicitly discusses any hiatus in mortuary practices in the Little Sea microregion, her model clearly implies a break between the Developed Neolithic and the Early Bronze Age. Again, radiocarbon evidence from the region reveals no such gap.

The second major difference between these models, and the most important for the research presented here, is the manner in which these researchers subdivide the Bronze Age. Goriunova recognizes three stages (Early Bronze Age, Developed Bronze Age, Late Bronze Age), each of which is associated with one or more mortuary traditions that are defined primarily on the basis of grave orientation, body position, and the use of ochre.

First, Goriunova's Early Bronze Age (~4000–3600 BP) is associated with *Glazkovo* graves, which are typically characterized in the Little Sea area by solid oval pavings covering pits that are occasionally lined with additional stone slabs. In addition, burials are predominantly single interments in extended supine position with their heads oriented to the southwest or west. As noted at KN XIV, there is a small degree of variation in each of these characteristics; however these variations are not believed to be important in a typological or culture-historical sense. Diagnostic grave inclusions include white nephrite rings and discs, and cylindrical beads.

Next, Goriunova associates the Developed Bronze Age (3800–3100 BP) with the *Late Glazkovo* mortuary tradition, which is distinguished from the earlier Glazkovo only by virtue of the extensive use of ochre to cover the individual. Although the use of ochre is most commonly associated with the Kitoi mortuary ritual, Goriunova et al. (2004) identify widespread ochre usage in three Bronze Age graves at each of the Little Sea sites of Uliarba (Nos. 6, 8, 10) and Kurma XI (Nos. 14, 15, 16). They also identify six graves at KN XIV (Nos. 2, 4, 5, 10, 14, 16) as exhibiting extensive ochre use, but it should be noted that this claim is seriously contested by Weitzel and Weber (n.d.) who suggest that the small degree of reddish discoloration observed in sediments or on bone is almost certainly a result of the both the oxidation of natural sediments and the use of fire at the site, rather than the use of ochre. Furthermore, they point out that only two graves at KN XIV (No. 31 and 77) is there evidence for reddish discoloration of both skeletal elements and sediments. Thus, it would seem that ochre use at KN XIV—if present at all—was limited to small applications rather than the extensive body coverage observed at Uliarba and Kurma XI, where the use of ochre is not contested. It should also be noted that radiocarbon dating of these ochre covered burials at Kurma XI reveals no chronological distinction between ochre and non-ochre covered Glazkovo burials (Weber and Goriunova 2005). This suggests that, to the extent that the ochre-covered individuals can be considered distinct from other Glazkovo graves, it is not a matter of change through time.

Neither Weber (1995; Weber et al. 2002) nor Kharinskii make any typological distinctions between different Glazkovo burials. But Kharinskii uses the term *Sagan-Nuge,* rather than Glazkovo, to describe this tradition in order to distinguish the Little Sea graves from contemporary Glazkovo graves found in other microregions. In particular, he points out that the Little Sea burials are oriented with their heads to the northwest, west, or southwest, while on the Angara and Lena rivers they tend to be oriented with their heads downstream, regardless of cardinal orientation. In addition, Kharinskii believes that Sagan-Nuge grave architecture is characterized by round pavings, but he notes that along the Angara and Lena rivers, Glazkovo grave architecture is more typically oval. It should be recalled, however, that at KN XIV round surface pavings were associated with disturbed graves and that undisturbed graves were always oval or subrectangular. Given that the vast majority of Glazkovo graves in this region were disturbed, it seems likely that an oval construction was probably more typical of the original architecture.

Finally, Goriunova identifies a Late Bronze Age during which two mortuary traditions are described as coexisting in the Little Sea area. The first tradition, referred to as the *Mukhor*, is characterized by round burial pavings, extended body positions with flexed legs, unusual burial orientation with their heads to the east or southeast (opposite orientation of Glazkovo burials), and especially by the wrapping of the deceased in birch bark. Turkin and Kharinskii (2004) point out that Goriunova's Mukhor tradition is based on only two graves in the entire Cis-Baikal: Grave No. 13 at Uliarba in the Little Sea area, and Grave No. 1 at Shumilikha. Besides the small number of cases, Turkin and Kharinskii (2004) do not see these two graves as having enough in common to be considered a single group and, therefore, dismiss altogether the notion of a Mukhor mortuary tradition in the Cis-Baikal. It should be noted, however, that like Goriunova, Turkin and Kharinskii (2004) consider Grave No. 13 at Uliarba to be distinct from the remaining graves in the region. More specifically, they believe that it likely represents evidence of an incursion from southern Baikal or northern Mongolia based on similarities with contemporaneous graves at the Fofanovo cemetery located near the mouth of the Selenga River where it enters Baikal's southeastern coast[3].

Goriunova's second Late Bronze Age mortuary tradition—the *Shumilikha*—is defined primarily by a sitting or tightly flexed body position, and is named after the site of Shumilikha on the Angara river, where a number of other such sitting burials were encountered. Goriunova et al. (2004) date these graves to the Late Bronze Age based on a typological assessment of metal working technology, the apparent presence of domesticated animal bones, and stratigraphic evidence from Grave No. 5 at Ulan-Khada IV, where a sitting burial was apparently found above a previously interred Early Bronze Age burial (Goriunova and Khlobystin 1992)[4]. Turkin and Kharinskii (2004) dispute each of Goriunova's lines of evidence, and point out that she ignores the fact that every radiocarbon date from Shumilikha dates to the beginning of the Bronze age, as do all of the dates for every other sitting burial across the entire Cis-Baikal (Figure 5.2). Consequently, Kharinskii dates the Shumilikha tradition to around the Late Neolithic–Bronze Age transition (Kharinskii and Sosnovskaia 2000; Turkin and Kharinskii 2004). Recent dates from sitting burials at Kurma XI appear to confirm this timing by demonstrating that they were contemporary with the earliest Glazkovo graves at the same site (Weber and Goriunova 2005).

Weber's (1995; Weber et al. 2002) general regional model, which is adopted for the current study, does not specifically accommodate the Shumilikha burial tradition;

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[3] In a recent publication Goriunova et al. (2005) also cite this burial from Fofanovo as an analogue for Grave No. 13 at Uliarba; however, their position that it represents a Late Bronze Age tradition has not changed.

[4] See discussion of Ulan-Khada IV below for more discussion of this grave and its role in establishing culture history.

however, on the basis of radiocarbon dates from Kurma XI, I have modified this scheme to incorporate sitting burials as contemporary with early Glazkovo (Figure 5.2). Whether these two burial protocols represent separate culture groups living side-by-side in the same region, as suggested by Goriunova and implied by Kharinskii, or whether they represent some sort of intragroup social distinction is presently unclear. This problem requires extensive reevaluation, including comparison with sites in the Trans-Baikal and northern Mongolia, and is beyond the scope of the current study.

5.2 BRONZE AGE MORTUARY SITES IN THE LITTLE SEA MICROREGION

Including KN XIV, 20 Bronze Age mortuary sites have been documented to date in the Little Sea microregion (Table 5.1). As discussed in Chapter 3 (Figure 3.11), radiocarbon dates confirm the timing of six of these Bronze Age sites (Uliarba, Sarminskii Mys, Khadarta IV, Kurma XI Shamanskii Mys, Sokhtyer IX); however, the remaining 13 locations were dated through typological methods and so must be evaluated critically. This is especially the case for those sites that have seen no excavation and for which age is interpreted on the basis of surface remains alone (e.g., Sagan-Nuge I, Ontokhoi, and Sokhter VII). I will begin by describing the six sites for which radiocarbon data are available before moving on to the other cemeteries, which I will discuss in geographical order beginning with Shide I and moving around the perimeter of the Little Sea to finish with the site of Kharansin I on Ol'khon Island (Figure 5.1).

5.2.1 Uliarba

Uliarba is located approximately 4 km to the southwest of KN XIV and between 10–35m above Lake Baikal on several terraces of the southwest-facing slope of the large Antukhai peninsula. Overall, the site covers an area of approximately 80 m by 90 m. Forty features from various periods were excavated by L.P. Ziablin in 1959 and O.I. Goriunova in 1976. Ziablin originally identified four groups of graves that he designated Uliarba I–IV; however, in a recent reevaluation, Goriunova et al. (2004) treat the entire complex as a single multi-period site that they refer to as simply Uliarba. The following description is based on data presented in this recent publication (Goriunova et al. 2004).

Using characteristics of grave architecture, body position and orientation, burial treatment, and grave inclusions, Goriunova et al. (2004) identify six Late Neolithic graves, 27 Bronze Age graves, two Iron Age graves, and five graves that could not be assigned to any period because of extensive disturbance. Although these researchers did not evaluate the spatial dimension of mortuary variability at Uliarba, it is clear from a visual examination of the site plan that the graves were not evenly distributed throughout the cemetery (Figure 5.3). Overall, five main clusters of graves are visible, which correspond quite closely to Ziablin's original designations plus the cluster excavated by Goriunova in 1976. First, a compact cluster of 23 graves is evident in the middle of the cemetery. Within this cluster a number of rows can be defined running both parallel and perpendicular to the slope. North of this central cluster, three smaller groups of graves are visible composed of three (Nos. 26–28), 2 (Nos. 34–35) and 5 (Nos. 35–38, 40) graves respectively. Next, approximately 50 m south of the central cluster, a row of three (Nos.

1–3) or perhaps four (No. 16) graves runs roughly perpendicular to the slope's fall line (i.e., northeast–southwest). Between this row and the main cluster exists a single isolated grave (No. 19). As I will demonstrate, these spatial clusters encode a number of chronological and social distinctions much in the same way as was evident at KN XIV (Tables 5.2–5.3). The two Iron Age graves (Nos. 21–22) are not included in this discussion.

Feature and Burial Levels

Goriunova et al. (2004) divide the 27 Bronze Age graves at Uliarba into three different mortuary traditions: Glazkovo, Shumilikha, and Mukhor (Figure 5.4). As discussed above, these researchers consider the Glazkovo tradition to predate the other two, but current radiocarbon data suggests strongly that they were all contemporary, at least during the early part of the Bronze Age. As a result, I will here consider the Bronze Age graves at Uliarba as a single chronological unit that is characterized by three different mortuary protocols. As reported in Chapter 3 (Table 3.2), the three available radiocarbon dates from the site confirm that it was contemporary with the high-collagen dates at KN XIV (Figure 5.2).

First, five graves (Nos. 7, 20, 30, 33, 40) were described as single burials of unknown age or sex interred in a sitting position (Shumilikha Tradition). It should be noted however, that this description appears to be based more on an evaluation of the compact grave architecture than the actual position of the skeletal remains. In Grave Nos. 20 and 33 the burials were entirely disarticulated and spread throughout their respective grave pits. In Grave 30 only a few bone fragments preserved, and in Grave No. 7 no skeletal remains were recovered at all. Only in Grave No. 40 do we have some evidence that a few bones were ever in articulation. The two femoral bones of this individual were found parallel to each other, and the feet were apparently found in anatomical position with their soles facing down. All other skeletal elements, however, were disarticulated and dispersed across the bottom of the grave.

Although the lack of articulation and poor preservation in these five graves may be a result of the fact that they were all disturbed in antiquity, we should also not discount other possibilities. In particular, it seems possible that these graves may have contained secondary bundle burials, child interments, or both. Given that there is no evidence that Bronze Age inhabitants of the region were fully sedentary, some individuals likely died while on trips away from the Little Sea. As such, if these individuals were to be interred at one of the Little Sea mortuary sites, it seems likely that partial or complete disarticulation of the bodies would have occurred—either because of the time needed to return the body to the area or as part of the pre-interment mortuary ritual. Likewise, corpses of individuals who died during the winter months may have been stored until the spring or summer when the ground would have been easier to dig and the paving stones easier to obtain. It is also possible that many of the sitting graves for which skeletal remains were missing may simply have been the smaller graves of children, in which the skeletal remains would have been less likely to preserve. At the site of Shide I (discussed below), where all of the graves were described as sitting interments, five of the nine individuals for whom age could be estimated were children. It seems possible, therefore, that part of the confusion surrounding the timing and origin of these so-called sitting burials (e.g., Goriunova 1975) may simply be a function of the failure to distinguish true sitting burials, which certainly do occur in the region, from children's graves or secondary bundle burials, which are also known to occur (Okladnikov 1955).

In terms of spatial organization, three of the five sitting burials (Nos. 30, 33, 7) were located in a single row running generally parallel to the slope's contour line and along the northwest edge of the central cluster of graves (Figure 5.4). This suggests that the rows running parallel to the slope's contour are, perhaps, more meaningful than the rows running perpendicular, which is opposite the case at KN XIV. One of the other sitting burials is also located within the central cluster, but is found at the southwestern edge. The final sitting grave is found in a relatively isolated location in the northeastern end of the site, and it is interesting to note that this individual possessed by far the greatest number and most diverse grave inclusions of all sitting burials.

The second Bronze Age mortuary protocol identified at Uliarba by Goriunova et al. (2004) consists only of Grave No. 13, in which one ~55 year old female (B13-1) and one ~50 year old male (B 13-2) were interred roughly side-by-side in supine position with flexed legs and their heads pointing east and southeast respectively. Small spots of ochre and copper-oxide were found on a few skeletal elements, and both individuals were apparently encased in some sort of birch bark wrapping. As mentioned above, Goriunova et al. (2004) date this grave to the Late Bronze Age by virtue of similarities with Grave No. 1 at Shumilikha on the Angara River, and the child grave No. 22 at Fofanovo on the Selenga River. The single radiocarbon date from this individual (3890± 40 BP), however, places it contemporary with other Bronze Age burials at Uliarba and with the peak of cemetery use at KN XIV. As noted above, Kharinskii and Sosnovskaia (2000) suggest that this burial represents the incursion of a new group into the region from the south; however, given that there are no other examples of such a protocol in the Little Sea microregion[5], and only one other example in the entire Cis-Baikal, it seems doubtful that this can be taken as evidence of an entire group's normative burial tradition. Furthermore, the older ages of the two individuals make them unlikely candidates to be the vanguard for a population on the move. The fact that Grave No. 13 is surrounded by a larger concentration of Bronze Age graves at the site suggests that either these individuals maintained some sort of relationship with the other people using this cemetery, or that they were attempting to give the impression that such relationships existed. Given that non-normative practices can be the result of a broad range of social, political or religious practices, it is unlikely that we will be able to provide more specific interpretations of this grave with the data currently available.

Goriunova et al.'s (2004) final group of 21 Bronze Age graves is typical of the Glazkovo mortuary protocol described extensively with reference to KN XIV (Chapter 4). Burials were, with slight variations, generally found within oval grave constructions in extended supine position with their heads to the west or southwest. Nineteen of the 21 graves contained a single individual, 1 grave contained 2 burials (No. 3), and 2 graves contained 3 individuals (Nos. 1–2).

Age was estimated for 18 of the 24 Glazkovo individuals (8 adults, 4 adolescents, 6 children; Table 5.2), and sex was determined for 7 of the adults (3 males, 4 females) and 2 of the adolescents (both male). At this point it is necessary to make a few comments at

[5] Although Goriunova does not include any other Little Sea graves in the Mukhor tradition, both Grave No. 1 at Shrakshura II and Grave No. 2 at Sagan-Nuge I (discussed below) exhibit a similar body position and orientation. Neither of these other two graves, however, contained evidence of birch bark wrappings.

with respect to the age and sex estimates provided for burials at all of the sites addressed in this study.

Link (1996:34) notes that Russian and Western physical anthropologists differ with respect to the methods they employ and the relative degree of accuracy they claim to be able to obtain. In particular, he notes that Russian determinations "typically include some child sexing and claimed 100% success rates for adult sexing and aging [which is] not in keeping with Western schools of thought (Link 1996:34)." In addition, cranial suture closure is a preferred method among Russian anthropologists for estimating age-at-death; however, this method is believed to be somewhat less accurate than are methods based on degeneration of the pubic symphysis or sternal rib ends (Buikstra and Ubelaker 1994:32). Therefore, while I employ the age and sex estimates for Little Sea burials as they are reported in the literature, there is probably good reason to treat these data with a reasonable degree of caution, especially considering that the methods used to derive these estimates are rarely reported.

Returning to Uliarba, it is interesting to note that, similar to KN XIV, Glazkovo children were preferentially interred in multiple graves and these graves were all located in a single row at the southern edge of the cemetery (Grave Nos. 1–3). Grave No. 1 contained three 6–7 year old children, Grave No. 2 contained one 6 year-old child and two male adolescents of approximately 16 years of age, and in Grave No. 3 an 11 year-old child was interred with an older male (>50 years). Grave No. 16, located along the same axis as Grave Nos. 1–3 also contained an adolescent (16–17 years) as did Grave No. 8 (~17 years old), which was the only subadult buried outside of the southern row. This latter burial (No. 8) was the eldest adolescent at the site and was also unique in that it was one of only three graves with large amounts of ochre covering the body (see below). It should be noted that all of the adolescents at Uliarba were older than the transition age from childhood–adulthood (~15 years) identified during the analysis of KN XIV in the previous chapter.

One significant difference with KN XIV—where subadult burials were all incorporated within the largest cluster of graves—is that the row of subadult graves at Uliarba was spatially segregated from the remainder of the cemetery.

When we look at the spatial distribution of males and female individuals for the entire set of Bronze Age graves at Uliarba, it is interesting that three of the four burials in the northeastern cluster were female (Nos. 35–37), and all of the adolescents and adults that were interred together with children were determined to be male (Figure 5.5). Given the large number of individuals for whom sex could not be determined, however, any sex specific patterns must be seen as tentative.

In terms of burial treatment, three Glazkovo individuals were described as having extensive ochre coverage of both the bones and sediments (Nos. 5, 8, 10). Burial No. 8 was a 14–18 year old of unknown sex, Burial No. 10 was a 36–50 year old male, and we have no information on the age or sex of Burial No. 5. Two of these graves (Nos. 5, 8) were located immediately beside each other, while Grave No.10 was placed only two graves away. As discussed above, there appears to be no chronological difference between ochre covered and non-ochre covered burials (see also discussion in Kurma XI below); however, the nature of the distinction is still unclear.

Finally, it should be noted that none of the Bronze Age graves at Uliarba—Glazkovo or otherwise—exhibited evidence for the use of fire on any of the skeletal remains. It will be recalled that such evidence was common in the centre cluster at KN XIV.

Grave Inclusions Level

Grave inclusions in Bronze Age graves at Uliarba were typical of material from this period throughout the region (Table 5.3). While small sample sizes make statistical analyses inappropriate, it is still possible to identify some interesting patterns.

First, if we classify and then rank each grave according to the number of artifact classes present (Table 5.4), two individual graves are clear outliers: Nos. 19 and 35. Grave No. 19, which is the spatially isolated grave in the southern part of the cemetery, contained a broad range of goods located in three distinct clusters that likely reflect their interment within organic sacks or pouches that did not preserve. Of particular interest in this grave were the fragmentary remains of a large bronze medallion that appears to be similar to an item recently found at Kurma XI (Goriunova and Weber 2005; Goriunova and Pavlova 2003). To date, these are the only two such items known from the entire Cis-Baikal.

Grave No. 35 also contained both a large number and wide variety of artifacts including both ornaments as well as various lithic, bone and metal implements found in a number of distinct clusters. Perhaps the most interesting aspect of Grave No. 35, however, was the fact that a dog was interred in the same grave above the human individual, and that this dog was spatially associated with a chert arrowhead.

Dog burials, while rare, are known from other Cis-Baikal cemeteries from both the Early Neolithic and the Bronze Age. In particular, Early Neolithic graves at Shamanskii Mys (No. 1[1972]) and Shamanka II (Baziliiskii 2005) contained dogs, as did Glazkovo graves at the unpublished sites of Obkhoi and Borki on the Upper Lena (Weber personal communication). A wolf burial was also found at the Late Mesolithic/Early Neolithic site of Lokomotiv on the Angara River (Bazaliiskii 2003). Other hunter-gatherer cemeteries across northern Eurasia are also known to contain canine burials, including the well-known site of Skateholm II in Sweden (Larsson 1990). Konopatskii (1982) reasons that the animals may have been employed for hunting the Lake Baikal seal as is documented, for example, among the Nenets in northern Siberia (Forsyth 1992:18). The use of dogs to control the movements of both wild and domestic deer is also noted among such groups as the Samoyeds, Nenets, and Dolgans (Forsyth 1992), and among these and other more northerly Siberian groups such as the Chukchis and Koraks, dogs were also used to pull sleds. Such relationships are, of course, also well documented from a number of Native North American cultures (Schwartz 1997:36-41).

Besides the functional uses as hunting aids and pack labour, there appears to be strong a tendency in these hunting and gathering cultures to consider dogs, and other canines, as not only sentient beings but as a form of non-human people with which social and kinship relations must be established. As such, dogs were often given residences and burials that closely resembled those of humans (Schwartz 1997:36–41). For many groups, canines were also seen as important spiritual resources for shamans. Among the Gilyaks in Eastern Siberia, for example, dogs were sacrificed during the Bear Festival in order to ensure that their spirits would return as bears (Schwartz 1997:77–85). Chukchis and

Koriaks also used the fat from sacrificed dogs to anoint wooden and stone spirit effigies in order to repel evil spirits (Forsyth 1992: 73). Finally, in some North American groups, it was the role of shamans to prepare the hunters, including the dogs, before they would go out in search of game. In some cases, this preparation would involve consuming dog meat, which would allow the shaman to channel wolf spirits (Schwartz 1997:35–36). In this context, it is interesting to note that Burial No. 35—which was that of a 30–35 year old woman—was also associated with a large number and diversity of objects that could be categorized as hunting/fishing implements, including 35 arrowheads, a spear point, a flesher, a fishhook, etc. Although it seems unlikely that we will ever be able to determine the exact nature of the role of dogs in Cis-Baikal prehistory, it is probably safe to conclude that the individual interred in Grave No. 35 would have maintained a strong relationship—probably social—with this particular dog and more likely with canines and canine spirits in general. Furthermore, it seems likely that such a relationship would have been associated with hunting, both on a practical and spiritual level.

A similar arrangement of animal bones found above another adult female burial was also documented in the neighbouring Grave No. 36; however it is not reported whether or not the faunal remains were canine. In Grave No. 16, dog phalanges were also present, along with a unique "sword" composed of 15 rectangular microliths that would have been set lengthwise along a bone or wooden shaft.

Four other graves are worth mentioning as exceptional in the diversity, quantity, and rarity of the associated inclusions. First, Grave No. 40 contained an unusually large number of items that were, again, found in three distinct clusters. As mentioned above, this was the only sitting burial to possess a significant number of grave inclusions, and it was also the most spatially isolated of the sitting graves.

Grave No. 2, which included two adolescent males and an infant, contained two very large clusters of goods just behind and between the heads of the burials. The first cluster, which Goriunova et al. (2004) associate with Burial No. 2-1, contained close to 140 flakes and blades placed in a circle within which were found an astounding 100 arrowheads, 2 scrapers and an abrader. Similarly, another cluster of lithic artifacts located between the heads of Burial Nos. 2-2 and 2-3 encircled a collection of ~100 small round pebbles. This cluster also contained two beaver mandibles, one fox mandible and one wolf mandible. Given the close relationships between foxes, wolves and dogs, it is not inconceivable that this may represent some of the same sorts of relationships as described above for Grave No. 35. Goriunova et al. (2004) do not believe that this artifact cluster can be associated with either of the two individuals; however, it seems unlikely that such a rich assemblage would have been associated with the 6 year-old child (No. 2.3) rather than the 14–18 year old adolescent (No. 2.2). On the other hand, in Grave No. 77 at KN XIV a group of 10 such pebbles was associated with a 12–15 year old young adolescent. The overall assemblage, including the beaver and fox mandibles, is also very similar to Grave No. 74 at KN XIV.

Grave No. 3, located immediately beside Grave No. 2, is also notable for the number of implements it contained, including such rare items as a bone harpoon, a nephrite blade, and a metal knife (Tables 5.3–5.4). Although Grave No. 3 was a double burial, all of the grave inclusions were associated with the senescent male (>50 years of age) rather than the 11 year-old child.

Finally, the two individuals in Grave No. 13, of the Mukhor type, were associated with a large number of both implements and ornaments. It is interesting, however, that all of the implements could be described as domestic: scrapers, flakes, a spoon, a needle and needle case. Considering the advanced age of both individuals (> 50 years), this may be an indication that they were no longer physically involved in hunting activities as appears to be the case for other burials possessing large assemblages.

When we examine the associations between Bronze Age grave inclusions and other mortuary variables, a number of patterns are obvious. First, graves in both the northeast and southern clusters can be clearly distinguished from those in the centre cluster. Five of the six graves with the greatest diversity of grave inclusions, as measured by number of artifact classes, are located outside of the central cluster (Nos. 19, 35, 2, 40, 3). The single highly ranked grave located within this area was the atypical Grave No. 13. Next, from the reverse perspective, 9 of the 11 lowest ranked graves are all located within the center cluster. The two low ranked graves found outside of the centre cluster were the double infant Grave No. 1 and Grave No. 24, which was spatially associated with an older Serovo grave. When we examine the spatial distribution of individual artifact classes, the distinction between the various areas of the cemetery is even more obvious.

Despite the fact that the centre cluster comprises more than half of the Bronze Age graves at Uliarba, almost all artifact classes are found in greater abundance outside of this area (Figures 5.6–5.14). Interestingly, the relationship is reversed for ground stone discs and rings: seven graves from the centre cluster contain these ornaments as opposed to only three from other areas (Figure 5.15). Like KN XIV, red deer canine pendants seem to be found in all areas of the site (Figure 5.16). The distribution of red deer canine pendants is also worth drawing attention to since it highlights at least one row in the centre cluster, which again seems to confirm that horizontal rows were more important than vertical rows at this site.

It is also worth noting that at both KN XIV and Uliarba the central cluster contains a greater proportion of ornaments to implements, while spatially segregated graves exhibit the reverse pattern. Although the concentration of ornaments in the centre cluster at KN XIV was partly explicable by the high concentration of subadults, this is clearly not the case at Uliarba, where children were not interred in the main cluster. Like at KN XIV, however, children were still never associated with implements. The only grave at Uliarba composed exclusively of children included only four small calcite discs and three red deer canine pendants. The two other graves that included children (Nos. 2–3) did contained a large number of implements; however, it seems more plausible that these would have been associated with the older accompanying individuals. While one adolescent (No. 8) was interred with very few items, the adolescents found in the southern row of graves (Nos. 2, 16) were associated with very large assemblages.

In general, then, it seems that the graves located outside of the main cluster were perceived as socially distinctive. As with the graves from the spatially distinct eastern cluster at KN XIV, both the size and the diversity of grave good assemblages found in these segregated graves is greater than those found in the main cluster of graves, and the composition of the assemblages appears to relate to hunting and fishing activities. Unlike KN XIV, however, the "rich" graves at Uliarba also contained an assortment of ornaments in addition to implements. In particular, the unusual bronze medallion in Grave No. 19, and the presence of a dog burial in Grave No. 35 and perhaps No. 36, suggests that at least some of these individuals may have been perceived to have important spiritual skills. The fact that three of the six graves in the northeast cluster at Uliarba were female indicates that Bronze Age women were not restricted from obtaining such positions of power (*contra* Okladnikov 1955). This is, however, unlike KN XIV where none of the five identified females were interred with any implements; however, the high number of graves at both sites for which sex could not be determined makes any examination of gender relationships tentative.

Summary of Bronze Age Graves at Uliarba

Overall, then, a number of very strong similarities can be seen between the Bronze Age components at Uliarba and KN XIV. First, as with KN XIV, a primary dimension of Bronze Age mortuary variability at Uliarba was the division of the cemetery into well-defined spatial clusters. The southern cluster of graves was associated with subadult burials, as well as with adult and adolescent burials containing atypically large and diverse artifact assemblages. Likewise, the graves in the northeast cluster of the site are also characterized by burials containing exceptional collections of grave inclusions. As at KN XIV, these exceptional burials seem to be associated with hunting activities, but it would appear that at Uliarba some of these individuals were also perceived to possess certain spiritual qualities. Interestingly, this spatial pattern holds true for both sitting burials and burials in extended-supine position, which implies that the two protocols were certainly integrated within a larger system. Unfortunately, the exact nature of the relationship between these protocols is still unclear.

Next, like at KN XIV, the centre cluster at Uliarba seems to encode a number of intersecting social distinctions. First, all four of the mortuary protocols identified by Goriunova et al. (2004) are found in this area. Next, in contrast to graves in other areas of the cemetery, burials in the centre cluster possessed proportionately fewer grave inclusions; however, they did posses a greater number of ornaments. Finally, within the centre cluster, rows of graves are clearly visible and appear to relate to larger social groupings as evidenced by both the distribution of the three sitting burials within a single row and the distribution of red deer canine pendants across several rows.

The third similarity between the two sites is that children seem to be distinguished from adults along the same dimensions of mortuary variability. Like at KN XIV, children were never buried with implements, and they were preferentially interred in multiple graves, suggesting that they may not have been perceived as wholly independent individuals and consequently were interred in larger social collectives. It is also interesting to note that the burials of adolescents at Uliarba were indistinguishable from those of adults. This is unsurprising given that all of these adolescents were older than 15 years, which was identified at KN XIV as the cutoff for child vs. adult mortuary treatment.

Despite these similarities between Uliarba and KN XIV, there are also some important differences. First, as noted above, children at both sites were preferentially interred in multiple graves and rows located in close proximity to other child graves, but at Uliarba these graves were segregated from the main cluster at the site whereas at KN XIV they were integrated within the main cluster. In addition, children from multiple graves at KN XIV were interred with adults or adolescents possessing relatively few grave inclusions, but at Uliarba the accompanying individuals were exceptional for the high volume and diversity of grave goods.

Second, although rows of graves were clearly meaningful at Uliarba, they were oriented perpendicular to the slope's fall line rather than parallel as at KN XIV. Given the importance that cardinal directions played in burial orientation, it would seem peculiar if the orientation of rows was not equally meaningful. Interestingly, the three Late Neolithic Serovo graves located in the north cluster of the site do form a row running parallel to the fall line.

Next, while the lack of age and sex data makes it difficult to draw firm conclusions, it was noted that both female and adolescent individuals at Uliarba were associated with abundant and diverse artifacts, which suggests that the power structure of Bronze Age societies was not based exclusively on age or sex. As noted above, at KN XIV female burials were never interred with implements, although the sample size was extremely small (n=5).

Fourth, the overall assemblage of grave inclusions at Uliarba was very similar to that at KN XIV, but one important class is almost entirely missing: cylindrical beads. At KN XIV virtually every grave in the centre cluster contained beads, but at Uliarba only the burials from the atypical Grave No. 13 possessed them. Likewise, the use of fire in Bronze Age graves, which was also a common feature of burial treatment at KN XIV, is entirely absent from Uliarba. Given that both beads and the use of fire were strongly correlated with only one cluster at KN XIV, and so seemed to encode a distinct social relationship, it may be the case that this relationship was not represented at Uliarba, or that it was represented in a different way. At the same time, other sorts of social relationships were present that we did not observe at KN XIV, as evidenced by the presence of sitting burials and the atypical Grave No. 13.

Finally, while at KN XIV the Bronze Age burials were spatially segregated from the single Late Neolithic Serovo burial, such was not the case at Uliarba. In fact, it seems that Bronze Age graves at this site were placed in reference to at least some of the older graves. Interestingly, the Serovo graves around which the Bronze Age graves were placed were those of children (Nos. 39, 41).

5.2.2 Sarminskii Mys

Sarminskii Mys is located on the south and southwestern facing slope of a short peninsula approximately 2 km to the northeast of KN XIV, and on the same shallow bay (Figure 5.1). Graves dating to both the Late Neolithic and the Bronze Age are located on a number of terraces between 21–52 m above the level of Lake Baikal, and the site occupies an oval area roughly 170 m by 120 m oriented roughly northwest–southeast (Figure 5.17). It was excavated for two field seasons in 1986 and 1987, during which 33 features were identified (Goriunova 1997, 2002). Primarily on the basis of burial orientation and treatment, 13 of these features were determined to be Late Neolithic Serovo graves and 13 were classified as Late Glazkovo graves. The remaining seven features were most recently designated as ritual structures (Goriunova 2002); however, the original excavators also considered the possibility that these may have constituted the graves of Glazkovo children whose skeletal remains did not preserve (Goriunova 1997). Given that trained osteologists were not present during most of the excavations described in this study, it would not be surprising if small and fragmentary skeletal or dental fragments might have been overlooked.

As discussed in Chapter 3, the radiocarbon dates for the Serovo component of the cemetery appear to be inaccurate because of contamination associated with low collagen yields and the extensive use of fire in the grave pit. Five dates obtained from Glazkovo burials at the site are consistent with those at KN XIV and fall between ~4500–3500 BP. Importantly, none of the Glazkovo burials exhibited skeletal charring to the extent observed in the Serovo burials, and in fact four of the five Glazkovo radiocarbon dates were derived from burials that exhibited no charring whatsoever. The single dated burial that was affected by fire showed only localized charring on the skull (No. 21). Given the chronological parallels with KN XIV, I will consider all of the Bronze Age graves at Sarminskii Mys as simply Glazkovo, rather than Late Glazkovo (*contra* Goriunova 1997, 2002).

Unfortunately, while Goriunova (1997) provides detailed descriptions of each Serovo grave at the site, the Bronze Age Glazkovo component has only been published in the form of a brief summary (Goriunova 2002) making comprehensive analysis of the sort conducted at KN XIV or Uliarba impossible (Table 5.5).

Feature and Burial Levels

Bronze Age graves at Sarminskii Mys were located on two main terraces between 21–48 m above the level of Lake Baikal. Three general clusters of graves can be identified (Figure 5.17). First, at the southern edge of the site, five relatively isolated graves extend south of a larger row of Serovo graves running across with the slope. Three of these Bronze Age graves are, in fact, aligned with this older row of Late Neolithic graves, while the other two create a pair oriented parallel to the slope's fall line. Next, on the site's central terrace, two groups of Bronze Age graves can be identified. First, a relatively compact cluster of six graves is found in the northeastern section of this terrace. If Grave Nos. 14 and 15 are considered to represent Bronze Age children's burials rather than cenotaphs or ritual structures, then the number increases to eight. Within this group there are no conspicuous spatial patterns of the sort observed at KN XIV or Uliarba. Two (Nos. 9-10) or perhaps four (Nos. 3, 16) additional graves are found along the southwest aspect of the same terrace, and an isolated grave (No. 7) is located roughly equidistant between these groups. Finally, two features (Nos. 5, 18) were located on the upper and most northern terrace at Sarminskii Mys, in an alternating line with two Late Neolithic Serovo graves; however, it is again unclear whether these two features represent ritual structures or Bronze Age child burials in which the skeletal remains did not preserve.

All of the Bronze Age graves at Sarminskii Mys were located below the typical architecture of overlapping paving stones covering a shallow grave pit (40–60 cm). In six cases (4, 12, 26, 27, 32, 33) the uppermost paving was a solid oval, while six graves exhibited the ring-like distribution of scattered stones typical of disturbed graves (2, 9, 10, 13, 21, 25).

All of the graves were single interments placed in extended supine position, and all were oriented with their heads to the northwest, with the exception of Burial No. 21, which was oriented to the west (No. 21). No skeletal remains were found within Grave Nos. 26–28, but based on the small size of the grave pits (~1.0–1.2 x 0.6 m) and the apparent lack of disturbance to the grave architecture, Goriunova (2002) infers that they likely contained infant burials (<1 year). She does not, however, rule out the idea that these could represent cenotaphs.

The only burial for which age and sex is reported based on skeletal remains is No. 12 ("older adult" female). Goriunova (1997) specifically mentions that subadult graves were spatially segregated from adult graves, but it is not clear whether this includes only the three empty graves, or whether additional subadult burials were recovered from the same northeastern cluster of graves. If we assume that all of the ritual structures were, in fact, children's graves as Goriunova (1997) originally suggested, then half of the graves at the site would have contained subadults. Unfortunately, at least on the basis of available data, there does not seem to be any way to evaluate this possibility.

The use of fire was identified in four graves (Nos. 2, 4, 21, 32), but only Burials No. 21 and 32 exhibited skeletal charring on the skull and lower vertebrae respectively. In Grave Nos. 2 and 4 the evidence was limited to small concentrations of charred sediment and charcoal in the layers above the burial.

Grave Inclusions Level

Unfortunately, only very general details are provided regarding the grave inclusions in Glazkovo graves at Sarminskii Mys. Goriunova (2002) describes the overall inventory as typical of the region's Bronze Age, and she notes that inclusions tended to be located near the head, chest or waist of the individuals. Burial No. 12, an adult female, was the only individual who could be distinguished by both the abundance and composition of the burial assemblage, which included several zoomorphic bone pendants shaped like bullhead fish, a bone spoon, a metal knife, bird bones, a pike mandible, and an unusual lunar-shaped pendant of green nephrite. Two other examples of this type of pendant are known from the Little Sea. One was found in another woman's grave at Shamanskii Mys (No. 1-1972), and another was recently uncovered during BAP's excavations at the nearby site of Kurma XI (see discussion of both of these sites below). Given the relative abundance of the items interred with this woman, it seems likely that she was perceived in similar ways as were the female burials at Uliarba. Once again, the presence of both animal bones and zoomorphic figurines may relate to this individual's ability to communicate with animal spirits.

Nephrite and calcite discs were found in three graves (Nos. 2, 4, 33), and red deer canines were distributed throughout the cemetery. In addition to the mandible and bird bones found in Grave No. 12, an articulated hare paw was also found in Grave No. 33. Once again, no mention is made of any cylindrical beads at this site.

Given the relative lack of available data, it is difficult to derive much in the way of general conclusions regarding the intrasite structure of Bronze Age mortuary variability at Sarminskii Mys. With the exception of the possible concentration of children within the northeastern cluster, no other categories of mortuary practice exhibited a conspicuous spatial component. In fact, the lack of spatial associations in the form of rows is, perhaps, the most noticeable pattern at this site. Again, beads are absent as is the extensive use of fire within the grave pit. Also, as with Uliarba, a female burial was particularly distinct in the quantity, diversity, and rarity of the grave inclusions. Finally, it is worth noting that Bronze Age graves at Sarminskii Mys never interfered with existing Late Neolithic graves at the site, despite the comparatively large number of interments from each period. Most of the Glazkovo graves were spatially segregated from the earlier Serovo features; however like at Uliarba, it appears that at least some Bronze Age graves (e.g., Nos. 12, 13, 21) were placed quite near to existing Serovo burials. The referencing of older graves by later peoples is an intriguing phenomenon that will be touched on during the discussion in Chapter 6.

5.2.3 Kurma XI

Kurma XI is located around 15 km northeast of KN XIV on three terraces along a southeastern and eastern slope of the Primorskii foothills (Figure 5.1). The graves are found around 300–400m from the Baikal shoreline and between 7–32 m above the level of Lake Baikal (Figure 5.18–5.21).

Twenty-six graves have been documented at the site, one of which was excavated in 1994 by A.V. Kharinskii (Sosnovskaia 1995), and 25 that were excavated by BAP in 2002 and 2003. Unfortunately, grave specific information is not yet available for this site, although a full analysis is currently being conducted as part of a Master's thesis at the University of Alberta (Metcalf n.d.). Weber and Goriunova (2005) do, however, present a brief summary of mortuary variability at Kurma XI in the context of evaluating the site's radiocarbon chronology (see also Goriunova and Pavlova 2003).

In addition to six Early Neolithic graves, Weber and Goriunova (2005) identify two types of Bronze Age graves. First, three graves were identified as sitting burials based on their small pit size and compact arrangement of skeletal remains. Grave inclusions included an axe/adze and disc made from green nephrite, as well as bone spoons and points. Interestingly, two of these sitting burials (Nos. 25, 26) were placed relatively near to the much older Early Neolithic Grave No. 24. The third sitting burial (No. 19) constitutes the easternmost grave in a 200 m long file of 19 graves—the remaining 18 of which comprise the second group of Bronze Age graves.

The 18 graves spread across a ~200 m long row along the base of the hill were determined to be Early Bronze Age Glazkovo based on both archaeological and radiocarbon data[6]. Fifteen of the 17 excavated graves contained a single individual, one grave was a double side-by-side interment (No. 7), and one grave contained no skeletal remains at all (No. 2). All 18 individuals were placed in extended supine position with the heads oriented to the southwest, or generally parallel to the shoreline. Three burials were completely covered in ochre (Nos. 14, 16, 17), which, as discussed above, Goriunova et al. (2004) associate with the Late Glazkovo tradition. Radiocarbon dates for these three burials, however, place them contemporary with the remaining Glazkovo graves at the site (Weber and Goriunova 2004).

Of the 16 graves, only two were undisturbed. Despite this, a number of grave inclusions were recovered including: axes/adzes and knives made from green nephrite, white nephrite and calcite discs, lithic arrowheads of various form, bifaces, red deer canine pendants, bone needles, spoons, bone points, harpoons, and metal knives and needles. As Weber and Goriunova (2005:188) note, it is again interesting that only a single grave at Kurma XI contained cylindrical beads (No. 16). They also note that eight of the 17 Glazkovo graves at Kurma XI contained metal goods, which is considerably

[6] One grave (unnumbered) was not excavated, but it is assumed to date to the same period based on surface architecture.

more than at KN XIV (Goriunova and Pavlova 2003). In addition to these typical Bronze Age goods, Glazkovo graves at the site also contained a large number of items that have no or few previous analogues in the Cis-Baikal including: an anthropomorphic bronze medallion (Grave No. 1: Goriunova and Weber 2002, 2003), an inscribed juvenile human femur, a fishing line-sinker with an inscribed anthropomorphic face, four deliberately broken half rings of white nephrite, a silver ring, and a green nephrite lunar pendant of the type described above at Sarminskii Mys and below at Shamanskii Mys (Figure 5.21). As mentioned above, these latter lunar pendants were both found in association with female individuals; unfortunately, Burial No. 12 at Kurma XI was not well enough preserved to obtain an estimate of sex.

Overall, Kurma XI seems to more closely resemble Uliarba than KN XIV. First, like Uliarba, it contains a range of Bronze Age burial protocols including typical extended supine burials, sitting burials, and burials covered in large quantities of ochre. Next, the extensive use of fire within grave pits is entirely absent, and again, only a single grave contained cylindrical beads. Unlike any of the sites discussed so far, however, Kurma XI contained no individuals under the age of 15 years and none over 50 years, and there is only one multiple interment.

Finally, similar to Sarminskii Mys, while it may be possible to identify spatial groups within the collection of Glazkovo graves at Kurma XI (e.g., Nos. 3–6; Nos. 9–13), there is little indication of the types of obvious rows or exclusionary clusters observed at either KN XIV or Uliarba; however, ongoing research may reveal the existence of more subtle patterns (Metcalf n.d.).

5.2.4 Khadarta IV

Khadarta IV is located 15–30 m above Lake Baikal on a southwest-facing slope of the Khaglan-Dalai bay, approximately 11.5 km northeast of KN XIV and 3.5 km southwest of Kurma XI (Figure 5.1). In 1991, 14 oval surface pavings were documented over an area of 70 m from west to east between two parallel bedrock ridges running approximately 40 m apart (Figure 5.22). In 1994, Kharinskii excavated three of these features (Nos. 1, 2, 13), and in 2005, BAP excavated an additional two (Nos. 11–12). Radiocarbon dates were obtained from two burials (Nos. 1, 13) confirming that they were, indeed, Bronze Age Glazkovo graves (Kharinskii and Sosnovskaia 2000). Two of the excavated graves were located in the western part of the cemetery (Nos. 1, 2), while the other three were found in the site's eastern half (Nos. 11–13). The following summary comes from the description provided by Kharinskii and Sosnovskaia (2000) and from BAP's unpublished field notes.

All five of the excavated graves exhibited the same basic architectural characteristics as the extensively disturbed graves at other contemporary sites: empty ovals of paving stones surrounding a rather shallow grave pit (<50 cm). Although extensively disturbed, skeletal remains were found in four of the five graves (Nos. 1, 11–13), and in three of these cases it was possible to determine that the individuals were each placed in extended supine position with their heads oriented to the southwest (No. 1), south-southwest (No. 13), or west (No. 12). Grave No. 2 contained no skeletal remains, and Grave No. 12 contained only a single mandible.

The individual in Grave No. 1 was a 25–30 year old woman and was associated with an antler point and a bone point, both found near the pelvis. Similarly, Grave No. 11 was an adult individual of unknown sex buried with a large concentration of artifacts in the pelvic region including: an antler flesher, a bone spoon, an awl, a chalcedony flake, and a fragmented nephrite knife. Around the ankles of this individual another concentration of goods was found that included two nephrite axes/adzes, an abrader, a second nephrite knife, an elk scapula, a bone spoon/shovel, a bone spoon/flesher and one unidentified bone tool. Grave No. 13 contained a 30–40 year old woman, as well as a cluster of nine lithic objects including: a chert scraper, a fragment of a chert scraper, a chert knife, a green nephrite adze, a chert spokeshave (?), and four quartzite flakes. While Grave No. 2 did not contain any skeletal remains, a single white nephrite disc and 15 calcite discs were recovered from the burial pit. Grave No. 12 did not contain any grave inclusions.

Examination of the site map reveals few obvious patterns. The graves in the western end of the cemetery do seem to be more closely associated with each other than the graves in the eastern end, and it is possible to interpret pairs of graves; however, neither of these patterns is as obvious or convincing as was the case at KN XIV or Uliarba. It is interesting to note that Grave Nos. 11 and 13, which contained nephrite axe/adzes as well as the greatest diversity of inclusions of the five excavated graves, were both located in the eastern part of the cemetery. It will be recalled that nephrite axes/adzes were generally restricted to the eastern cluster at both KN XIV and Uliarba, and that this area was also the location of burials with both the greatest number and greatest diversity of grave inclusions.

The small sample size prevents us from examining in any great detail patterns relating to age or sex, although it is worth mentioning that one of the graves with a large diversity of goods, including a nephrite axe/adze, was once again a female (No. 13).

5.2.5 Shamanskii Mys

Shamanskii Mys, also known in the literature as Khuzhir or Burkhan Mys, is located on the edge of a narrow terrace on the Khuzhir Peninsula, which juts into the Little Sea from the northwestern coast of Ol'khon Island (Figure 5.1). Just off the tip of this peninsula is a spectacular natural rock formation known as Shaman's Cape or Burkhan Cape (Figure 5.23), which contemporary Buriat peoples in the area regard as sacred. Ethnohistorical documents reveal that the perception of this place as powerful has deep roots in history, and archaeological evidence suggests that this was also the case during prehistoric times (Konopatskii 1982:100; Okladnikov and Konopatskii 1975; Weber et al. 1998, 2002). A series of excavations in 1972, 1973, and 1975 uncovered 11 graves: 1 Early Neolithic, 3 Late Neolithic, and 7 Bronze Age. Konopatskii (1982:31–63) summarizes the results of these investigations.

Six of the seven Bronze Age graves are found in a compact cluster along the eastern edge of the terrace (Figure 5.24). Within this cluster a distinct row of three or perhaps four graves is obvious. The seventh grave is found approximately 20 m south of this cluster.

Feature and Burial Level

Grave architecture was typical of the region, although all seven of the Bronze Age graves were disturbed in antiquity making it difficult to infer precise details. In a few cases, fragments of wood as well as birch and larch bark were noted within the grave pits (Nos. 1-1973, 1-1975). In five cases the graves were oriented west–east, while one grave was oriented southwest–northeast, and one grave was oriented northwest–southeast (Table 5.6). It is worth nothing that the single isolated grave (No. 1-1972) was one of the graves with the atypical orientation.

Human remains were recovered from six of the graves, while one grave contained only a dog mandible and associated artifacts. Of these six graves, five contained a single individual and the other was a double burial (No. 3-1973).

Age and sex estimates were derived for each adult individual (Table 5.6), and it is worth noting that there was only a single subadult, which was interred together with an adult female in Grave No. 3-1973. This child is also notable in that it had a lithic arrowhead embedded in its scapula, which almost certainly would have contributed to its death. Of the six adults, three were males and three females, and within the main cluster of graves there seems to be a spatial division between the two sexes (Figure 5.25). The lone isolated Bronze Age grave was also that a female (No. 1-1972). Although the sample size is small and the methods of sex determination are not provided in the available literature, it is still interesting to note that the sex ration is equitable.

Fire was not observed on any of the skeletal remains, but Konopatskii (1982) notes that there was a fire pit in the upper levels of Grave No. 2-1972, which he attributes to the individuals who disturbed the graves. Small fragments of charcoal and burned birch bark were also found in the upper levels of Grave No. 1-1973.

While the upper bodies of all Bronze Age burials at Shamanskii Mys were disturbed, Burial No.1-1975 is unique in that only the cranium was disarticulated, and it was found upside down. It is unclear whether this was a result of the grave disturbance, or whether the individual may have been interred with the head already removed, as was interpreted in a few graves at KN XIV.

Grave Inclusions Level

In one of the rare instances that mortuary sites in the Little Sea have been discussed in non culture-historical terms, Okladnikov and Konopatskii interpreted Shamanskii Mys as the burial place for "... a kind of 'aristocrats', maybe the heads of tribes or especially prominent people—the luckiest hunters (Okladnikov and Konopatskii 1975:304)." In particular, they defined Burial No. 2-1972 as a seal hunter on the basis of the quantity and form of the grave inclusions as well as on the basis of several "ritual pits" located around the graves containing seal remains (Table 5.7). One such pit was located approximately one meter from Grave No. 2-1972 and actually had human remains lying on top of it as a result of the grave disturbances. A second pit containing seal remains was found to the south of the Bronze Age Grave No.1-1975.

It is interesting, however, that Okladnikov and Konopatskii (1975) did not also mention the woman interred in Grave No. 1-1972, which was no less rich in implements than Burial No.2-1972, and considerably richer in ornaments, including a rare lunar shaped pendant of the sort described at both Sarminskii Mys and Kurma XI. It is tempting to ascribe this omission to Okladnikov's preconceived notions of gender relations among Glazkovo peoples. As a reminder, for Okladnikov (1950, 1955) the Glazkovo was the culmination of the entrenchment of patriarchal social relations, and he interpreted extensive gender inequality in mortuary ritual. The presence of a woman at what is supposed to be an especially powerful place, interred with a large collection of grave inclusions—including some rare nephrite and copper items—is clearly inconsistent with this position. As we have seen at other Bronze Age sites, women are often distinguished by the quantity and diversity of burial goods. The nephrite lunar pendant, in particular, appears to be associated with females.

With respect to spatial patterns, it is interesting that both of these "rich" graves were the only two Bronze Age graves that were not oriented west–east. In fact, a view of the site plan (Figure 5.24) reveals that Grave No. 2-1972 looks out of place within the main cluster of Glazkovo graves, which were all oriented in the same direction, and which were together placed into orderly rows. Grave No.1-1972, of course, was segregated from the remaining graves. In both cases, then, these two graves were not only distinguished by their grave inclusions, but they were also set off, whether physically (No. 1-1972) or in terms of grave orientation (No.2-1972), from the other graves.

The single Bronze Age grave with the dog mandible (No. 4-1973) should also be singled out here, if anything to highlight the continuity of practice at Shamanskii Mys throughout the Neolithic–Bronze Age. Grave No. 3-1972 contained the remains of one Early Neolithic Kitoi individual interred beside a dog. In addition, another dog was interred in its own grave approximately 1 m south of the Neolithic Burial 1-1973, and

Konopatskii (1982) believes that this dog burial was likely one of the first graves at the site. It would appear, then, that dog interments at Shamanskii Mys not only have a deep history, but that they were a consistent feature at the site for the next several thousand years.

5.2.6 Shide I

Shide I is located 3 km southwest of KN XIV and 1.5 km west of Uliarba on the slope of the Shide bay on the northwest coast of the Little Sea (Figure 5.1). It was first researched in 1959 by Gorbunova, and has seen a number of return expeditions by Svinin in 1973 and 1977, and Goriunova in 1988 (Goriunova and Svinin 1996). The following discussion is based on a short summary published by Gorbunova and Pshenitsyna (1992).

Overall, 14 graves were excavated, 9 of which were visible on the surface and 5 of which were subsequently encountered during excavation. All 14 graves were found in a compact cluster approximately 25 m by 20 m in size (Figure 5.26). The grave architecture at Shide I was characterized by rings of overlapping paving stones surrounding circular or slightly oval grave pits that ranged from 60–100 cm in diameter and 50–140 cm in depth. The pits were often lined with vertically placed paving stones and Gorbunova and Pshenitsyna (1992:65) consider it possible that these would have supported a ceiling for the grave pit. They also note that the grave itself may have been marked on the surface by an additional fence of small stones, but since all of the graves were disturbed in antiquity, it is difficult to determine the exact nature of the original architecture.

In four cases no skeletal remains were found within the grave pits (Nos. 1, 8, 13, 14), while the remaining 10 graves contained a range of skeletal elements that Gorbunova and Pshenitsyna (1992) interpret as having been placed in sitting or crouched position with the arms bent under the hips. As at Uliarba, this interpretation is based as much on the grave architecture as the actual position of the bones, since in most cases the skeletal remains were highly incomplete and disarticulated. As with the sitting burials at Uliarba, then, it seems entirely possible that some or all of these burials may represent secondary bundle burials rather than true sitting burials.

It is also notable that of the nine individuals for which an age at death could be estimated, five were children under the age of six years, and one was a 16–18 year old adolescent (Table 5.8).

The extensive use of ochre to cover all or some of the bones was observed in three graves (Nos. 2, 7, 9), but no evidence for the use of fire is reported.

Very few grave inclusions were recovered from the site, which Gorbunova and Pshenitsyna (1992) attribute to the extensive grave disturbance; however, it should be recalled that the most extensively disturbed graves at the sites already discussed also contained the greatest quantity of grave inclusions. This suggests that, perhaps, the graves at Shide I never contained particularly rich assemblages.

The original excavators assigned this site to the Late Neolithic Serovo period based on the form of the arrowheads recovered from the upper layers in Grave Nos. 8 and 9 (Gorbunova and Pshenitsyna 1992), but Goriunova and Svinin (1996) date this site to the Bronze Age by virtue of the sitting burial positions. The fact that every grave at Shide I is presumed to have been a sitting burial makes this site unique, as does the apparently high proportion of subadults. Other than the very compact nature of the site, no other spatial patterns could be identified.

5.2.7 Shide VIII

Shide VIII is located approximately 1.5 km east from Shide I. As such, unlike most other Bronze Age cemeteries, which tend to be found near and overlooking Lake Baikal, Shide VIII is situated on the southwest slope of a small hill located well inland from the Shide Bay (Figure 5.1). Seven surface pavings were documented, but none have been excavated and the site is only tentatively dated to the Bronze Age based on the grave architecture visible on the surface (Goriunova and Svinin 1996:103).

5.2.8 Skrakshura II

Shrakshura II is located 21–28 m above Baikal at the tip of the Shrakshura peninsula, around 5 km southwest of KN XIV and 1 km northeast of the mouth of the Kharoi River (Figure 5.1). Eighteen constructions were visible on the surface as solid ovals composed of several layers of overlapping paving stones. The published site map is extremely general, and reveals only that the bulk of the graves are located between two peaks in a broad band covering an area of approximately 100 m by 20 m (Figure 5.27).

In 1986 a single Bronze Age grave (No. 1) was excavated (Goriunova and Svinin 1996: 107–108), and a later expedition in 1988 uncovered one Late Neolithic Serovo grave (No. 2; Goriunova 1997:63-65).

The Bronze Age grave contained a single individual lying in its side in a flexed body position with the head oriented to the east. The only grave inclusion was a bronze half-ring. Interestingly, Goriunova 1997 does not make a connection between this individual and the atypical Grave No. 13 at Uliarba, in which two individuals were placed in flexed positions with their heads to the east or southeast.

5.2.9 Khalurinskii Mys I

Khalurinskii Mys I is located on the northwestern shore of the Little Sea around 7 km southwest of KN XIV and 2 km southwest of Shrakshura II (Figure 5.1). The graves were found approximately 200 m from the very tip of the Khalurinskii Peninsula between 32–50 m above the level of the lake (Figure 5.28). Overall, 10 pavings were documented on the surface, 7 of which took the form of empty rings, and three of which were solid ovals (Goriunova 1997:66-70; Goriunova and Svinin 1986: 107–108). Of these 10 constructions, 4 were excavated between 1984 and 1985; however, only two revealed the presence of graves (Nos. 1–2).

Grave No. 1 contained the fragmented remains of a single skull as well as unidentified tubular long bones. A single green nephrite knife was also discovered associated with the skeletal remains. Although neither the burial position nor orientation is mentioned in the available literature, this grave is described as dating to the Bronze Age. Grave No. 2, located approximately 25 m northwest (upslope) of the first grave was dated typologically to the Late Neolithic (Goriunova 1997).

Unfortunately, the published site plan shows only the relative locations of the two excavated graves but not the locations of the six unexcavated features, making it impossible to examine intrasite spatial organization. In terms of the overall location of the site, Khalurinskii Mys somewhat resembles the site of Shamanskii Mys (discussed above) in that it overlooks a dramatic rock outcrop that juts into the Little Sea.

5.2.10 Sokhter VIII

Sokhter VIII consists of a single grave located on the southern shore of the Little Sea, around 8.5 km south-southwest of KN XIV and 2 km south of Khalurinskii Mys (Figure 5.1). This feature has not been excavated, but it is tentatively assigned to the Bronze Age based on its solid oval construction and southwest-northeast orientation (Goriunova and Svinin 1996: 145–146).

5.2.11 Sokhter IX

Sokhter IX is located on the eastern slope of the same hill as Sokhter VII, and it also consists of only a single grave visible on the surface as an empty oval (~2.3 m x 3.0 m) composed of 2–3 layers of paving stones. A.V. Kharinskii excavated this grave in 1994 and revealed a single sitting burial with no grave inclusions. Based on the body position and grave construction, the grave was assigned to the Bronze Age (Goriunova and Svinin 1996: 146). The single radiocarbon date from this individual (4425±60 BP) is consistent with this interpretation and places the grave at the very beginning of the Bronze Age.

5.2.12 Guroo-Ushoon IV

Guroo-Ushoon IV is found 6.5 km to the south-southwest of KN XIV and 2 km northeast of Sokhter IX (Figure 5.1). Only a single ring-like paving was visible on the surface in a hollow between two peaks approximately 180 m to the east of the northern tip of the small Guroo-Ushoon bay. The grave has not been excavated, but based on surface characteristics it is tentatively dated to the Bronze Age (Goriunova and Svinin 1996:149).

5.2.13 Ontokhoi

Ontokhoi is located approximately 5 km south of KN XIV and 3 km northeast of Guroo-Ushoon IV (Figure 5.1). The graves were found roughly 300 m from the tip of the Ontokhoi cape, which extends east into the large Sagan-Nuge bay. This bay also marks the beginning of the Ulan-Khada peninsula, which defines the southern border of the Little Sea's mainland coast.

Goriunova and Svinin (1996:154–155) describe an accumulation of solid oval pavings, but there is no indication of how many such features were visible, nor on what basis the researchers determined that the site likely dates to the Bronze Age.

5.2.14 Sagan-Nuge I

Sagan-Nuge I is found on the west facing slope of the large Sagan-Nuge bay, which is located around 5 km south from KN XIV (Figures 5.1, 5.29). Two graves at the site have been excavated, but it is not clear whether or not other graves were visible on the surface (Goriunova and Svinin 1996:154–155; Baruzdin et al. 1992).

The first grave, excavated in 1956 by N.M Reviakin, was characterized by a rounded paving covering a single individual in extended supine position with its head oriented to the north-northwest. Evidence of ochre was found on the bones, but the extent of use is not specified. The authors concluded that this individual dates to the Bronze Age (Baruzdin et al. 1992).

The second grave, excavated in 1959 by Iu. D. Baruzdin, contained a single individual of old age lying on its left side with flexed legs and its head oriented to the east. Fifteen rodent incisors were found around the ankles, and another was found at the skull. The unusual orientation and burial inventory makes dating of this individual difficult. Neither Goriunova and Svinin (1996) nor Baruzdin et al. (1992) relate this individual to Grave No.1 at Shrakshura II or Grave No. 13 at Uliarba (described above), but it should be noted that all of these burials exhibit similar flexed body positions and eastern orientations, which is atypical for Bronze Age burials in this region.

5.2.15 Ulan-Khada II

The Ulan-Khada locality consists of a number of habitation and mortuary sites from various periods and is located in a cove near the tip of the large Ulan-Khada peninsula, which defines the southern border of the Little Sea's mainland coast (Figure 5.1). As discussed in Chapter 2, the investigation of the rich archaeological record in this cove stretches back as far as Petri's work in the early 20th century and it remains an important centre of fieldwork today.

For the present discussion there are four mortuary sites of relevance: Ulan-Khada II, Ulan-Khada IV, Ulan-Khada V, and Ulan-Khada VI. These sites are all located in the same general vicinity, but the available literature is not clear on their exact relative locations. Therefore, I will not combine them into a single cemetery, as was done at Uliarba. Ia. A. Sher excavated all four sites in 1959, and these investigations are summarized by Komarova and Sher (1992). Goriunova and Khlobystin (1992) discuss the dating of these sites.

Ulan-Khada II is located on the western slope of the bay, 10–15 m below the crest. In total, six graves were visible on the surface as clusters of overlapping paving stones. Four of the graves were found in relatively close association with each other (Nos. 1–4), while the other two were located further up the slope (Nos. 5–6).

All of the graves shared the typical Bronze Age grave architecture of a solid oval or ring of paving stones covering a shallow pit. Skeletal remains were recovered from five of the graves and all were disturbed and incomplete to varying degrees (Table 5.9). Despite this, in four cases it was possible to determine that the individuals had been interred in an extended supine position with the head to the northwest or north-northwest, while one adult female was placed in a tightly flexed position with the head to the west (No. 5). Although a flexed body position occurred in both Early Neolithic and Bronze Age periods, this individual was dated to the Bronze Age based primarily on a lack of ochre:

> Flexed burial position on the side is encountered in both Kitoi and Glazkovo periods. However, Kitoi graves require the complete coverage of the bones with ochre. Given that this burial lacks such treatment, we can classify it as dating to the Bronze Age. [Goriunova and Khlobystin 1992:57; translated by HGM]

As I discuss below in more detail during the description of Ulan-Khada IV, there now appears to be good reason to question the validity of using either the presence or the absence of ochre coverage as a reliable typological criterion (see also Weitzel and Weber n.d.). As such, the age of this individual should likely be reevaluated using radiocarbon methods.

Excluding Grave No. 5, then, three adults and one infant were identified. Similar to infants at other sites, this individual did not possess any grave inclusions.

Particularly worthy of mention is the artifact assemblage of Burial No. 3, which included 16 chert arrowheads, a nephrite knife, a variety of bone and antler tools, a bear tooth, a wolf mandible, and 63 round pebbles. This is very similar to the assemblage described above for Grave No. 2 at Uliarba. Grave No. 2, at Ulan-Khada II also contained a large and diverse collection of items including 23 chert arrowheads, a bronze knife, and a variety of other bone and lithic tools. One of these bone tools, of unknown function, was found where the head of this individual should have been. Interestingly, the two graves located further up the slope (Nos. 5–6) contained relatively smaller and less diverse assemblages.

5.2.16 Ulan-Khada IV

This site is located on the south part of the bay at the foot of a small hill. None of the graves were visible on the surface since considerable deposits of aeolian sand covered the area. In total, 21 features were excavated, of which 11 turned out to be graves. It should be noted, however, that the original excavators suggested that at least four, and perhaps all of the remaining ten features may have been the remains of infant burials, for which bones did not preserve in the sandy sediments (Komarova and Sher 1996). In all of these cases, round circles of paving stones were observed, but no skeletal remains were identified.

Five graves were located in a single row, and two additional graves were found adjoining this row (Figure 5.30). A pair of graves was found approximately 35 m to the northwest, and two other isolated burials were found at the northern and northeastern eastern edges of the site.

Three of the graves found outside the main cluster (Nos. 12, 13, and 15) are currently dated to the Early Neolithic Kitoi tradition (Goriunova and Khlobystin 1992) based primarily on the extensive use of ochre and the general lack of grave inclusions. The remaining eight graves were all classified as Bronze Age; however, it should be noted that the chronology of Ulan-Khada IV is somewhat controversial (e.g., Goriunova and Khlobystin 1992; Kharinskii and Sosnovskaia 2000; Turkin and Kharinksii 2004). In particular, graves at the site were assigned to particular culture-historical traditions at a time when extensive use of ochre was known only from Early Neolithic graves. Similarly, the absence of extensive ochre use was believed to be a clear indicator that the grave could not date to the Early Neolithic. As with Grave No. 5 at Ulan-Khada II discussed above, when discussing the chronological placement of Burial No. 5.3[7] at Ulan-Khada IV, Goriunova and Khlobystin (1992) were free to make the following conclusion:

[7] Goriunova and Khlobystin refer to this burial as 5C.

> A supine body position with flexed legs is encountered in both Kitoi and Glazkovo graves in the Baikal region. However, the absence of complete coverage of this burial with ochre (which is a characteristic feature of the Kitoi Culture) suggests that this individual dates to the Bronze Age.
> [Goriunova and Khlobystin 1992; translated by HGM]

Since this time, as has been documented at other sites above, it has become clear that a small proportion of Bronze Age graves exhibit extensive ochre coverage, and the recent radiocarbon dating of burials at Kurma XI has also confirmed that some Early Neolithic graves in this region were not covered in ochre (Weber and Goriunova 2005). As a result, a number of researchers in the region believe that the chronology of Ulan-Khada IV is due for a comprehensive reevaluation in which radiocarbon dating will be required (Weber and Goriunova 2005). While such a comprehensive reevaluation was beyond the capabilities of the current study, some general observations are still in order, particularly with respect to Grave No. 5, on which Goriunova relies extensively to establish the chronological relationships of the Bronze Age mortuary traditions across the entire region.

Grave No. 5 contained four individuals on three different layers that, according to Goriunova and Khlobystin (1992), date to three different periods[8]. Their justification for this conclusion, however, is not entirely convincing. At the bottom of the grave pit a 20–30 year old woman and a 40–50 year old man were interred side-by-side in extended supine positions with their heads to the southeast. The woman was associated with three drilled deer teeth, a split boar tusk blade, two chert arrowheads, five lithic blades, and a lump of ochre. The male was also associated with a split boar tusk blade. As noted above,

[8] There is no mention of this in Komarova and Sher 1996, nor do Goriunova and Khlobystin (1992) make explicit why overlapping burials should have to correspond to entirely different cultural periods.

this individual was dated to the Bronze Age by virtue of the absence of extensive ochre coverage. Given recent developments, some researchers maintain that the lower graves are more similar to Kitoi burials and should thus be reassigned to the Early Neolithic period (Bazaliiskii personal communication).

Above these individuals, on a separate burial layer, was found another individual of unknown age or sex placed in supine burial position with the head to the northwest (although the cranium was disarticulated and found some distance away). The legs of this individual were flexed, and Komarova and Sher (1992) suggest that it was only after the body decomposed that the leg bones fell down to the side. Directly on top of these legs a third person was placed apparently in a sitting position. Goriunova and Khlobystin (1992) argue, first, that since the graves are all different, thus not directly overlapping with each other, they must relate to different mortuary traditions dating to entirely different periods. As further support they note that the top individual could not have been interred until after the second individual's legs had fallen over, and so they could not have been contemporary. It is unclear why they do not believe that the second individual could have been interred in a supine position with flexed legs that were already parallel to the grave floor as is common in other graves. In any case, since the second individual most closely resembles other Bronze Age graves throughout the region, the sitting burial was interpreted as a more recent phenomenon. Comparisons with other graves at Uliarba and Shumilikha, which were already believed to date to the Late Bronze Age by virtue of typological similarities with graves in other regions (Goriunova 1975; Goriunova and Smotrova 1981), permitted Goriunova and Khlobystin (1992) to conclude that sitting burials in the Little Sea region were a Late Bronze Age phenomenon. As we have seen, however, no radiocarbon dates, either in the Little Sea or at the comparative sites of Shumilikha and Uliarba, agree with this interpretation.

How then are we to interpret this grave? While Bronze Age burials appear to have been placed in reference to existing Early and Late Neolithic graves at a number of sites (e.g., Shamanskii Mys, Sarminskii Mys, Uliarba), the opening and reuse of individual graves by later groups is virtually undocumented in the Little Sea area. It may be that the thick sand deposits at this site made graves more difficult to locate on the surface and so such a practice in this case was accidental. It may also be the case that these burials are, to a reasonable degree, contemporary in which case the reuse of the grave may represent instances of referencing ancestors in order to establish or reaffirm social relationships. It would be premature to take this speculation much further until a reliable chronology can be established, but it is interesting that Grave No. 4 at this site may provide evidence of just this sort of reuse by contemporary groups.

Grave No. 4 contained six individuals on three different burial layers. In this case, all three layers are interpreted as Bronze Age. The bottom layer is the most interesting in the context of the current discussion since it was characterized by a single burial in extended supine position along with a second burial that Komarova and Sher (1992) interpret as a secondary bundle burial. While it is not possible on the basis of current evidence to determine whether this bundle burial would have been interred at the same time as the supine individual, it is not inconceivable to think that it may have been interred later, much in the same way that the top individual in Grave No. 5 was believed to have been. The remaining three individuals, located in higher layers, were entirely disarticulated and fragmented, likely as a result of grave disturbance.

Feature and Burial Level

In general, the Bronze Age graves from Ulan-Khada IV exhibit considerably more variability than at other sites (Table 5.10). Including Grave No. 5, three graves were single interments (Nos. 1, 2, 8), three were double (Nos. 3[9], 11, 14), one grave contained four individuals (No. 5), and one contained six individuals (No. 4).

Body position included extended supine, sitting, supine with bent legs, flexed on the side, and a secondary bundle interments, often with several of these within the same grave. In several cases it was not possible to determine body position as a result of extensive disturbance to the remains.

Only two infants are known to have been buried at the site; however, as noted above the original excavators believe that at least four and perhaps as many as 10 additional features may represent infant graves in which skeletal remains did not preserve (Komarova and Sher 1992). One of the known infants was interred in a double grave with an adult, and the other was interred in an individual grave. In both of these graves the heads of the individuals were oriented southwest, which differs from the northwestern orientation of most of the other Bronze Age individuals at the site. There was a roughly equivalent number of males and females (8:6). The use of ochre or fire was not noted on any of these individuals.

[9] In addition to two sitting burials, an adult clavicle was found in this grave; however, Komarova and Sher (1992) do not mention whether or not it could have come from one of these individuals.

Grave Inclusions Level

Grave inclusions at Ulan-Khada IV were typical of the area, with a couple of notable exceptions. First, boar tusk blades were associated with six individuals from three different graves (Nos. 1, 4, 5). Such items are known from the broader Cis-Baikal, but have only been documented at Bronze Age sites in the Little Sea at Kurma XI (Grave No. 15; Goriunova and Pavlova 2003). Grave No. 15 at Kurma XI was also unique in that it was found in an extremely deep grave pit and with a silver ring on its cranium.

Also, compared to many of the other sites discussed so far, graves at Ulan-Khada IV contained relatively few artifacts. Excluding the controversial Burial No. 5.4, only the secondary bundle interment in Grave No. 4 can be distinguished by the size and diversity of the associated assemblage, and even this is not a large collection relative to other sites. Included were one bone harpoon and one awl, a white nephrite pendant in the shape of a small axe, a bear tooth, a boar tusk, and a moose head figurine.

Aside from the segregation of the three known Early Neolithic graves, and the single row of Bronze Age graves, no other spatial patterns were apparent at the site.

5.2.17 Ulan-Khada V

This site is represented by only two graves at the eastern end of the same bay as the other Ulan-Khada sites (Komarova and Sher 1992). Grave No. 1 was found directly on the slope, and the second grave was found in a slight depression in the ridge leading to the lake's waters.

Grave No. 1 was extensively disturbed but contained the incomplete remains of a single individual. Unfortunately, details on age, sex, or body position, could not be determined. Under the paving of Grave No. 2, two distinct pits were identified, each containing a single individual. The first individual, No. 2a, was represented only by three small cranial fragments, a mandible, two tibiae, and a right femur. Based on the location of these elements, the individual was determined to have been placed in an extended supine position with the head oriented to the northwest.

Burial 2b was also disturbed, but the legs were still in anatomical position and it was interpreted that the individual was placed in a supine position with flexed legs and the head oriented to the northwest.

No grave inclusions could be directly associated with any of these individuals; however, a flat knife-like blade and a pottery fragment were found in the paving of Grave No. 2.

5.2.18 Ulan-Khada VI

Ulan-Khada VI is composed of only a single grave located on a slope running down to the water east of Ulan-Khada V (Komarova and Sher 1992). The burial was represented by only the femora, a right ulna, foot bones and several vertebra in the centre of the pit. Unfortunately, it was not possible to determine age, sex, or body position from these remains. Only a single cylindrical bead and three ceramic fragments were recovered from the upper levels of the paving.

5.2.19 Kharansin I (Ol'khon Island)

Kharansin I is located 2.5 km northwest of Shamanskii Mys and 17 km south of Ol'khon Island's northern tip (Figure 5.1). More specifically, it was found on a south-facing slope of a small hollow approximately 100 m south of the island's northwestern shore. Eight graves were excavated in 1959, and the results of these excavations are summarized by Kachalova and Chernikov (1992). Unfortunately, a site map was not published; however it is interesting to note that the site is the only Bronze Age cemetery in the Little Sea that is located on a slope of land facing directly away from the water.

All of the graves were heavily disturbed in antiquity and exhibit the typical grave architecture of an empty oval of overlapping paving stones. Grave pits, while extensively disturbed, are described as rectangular in shape and were oriented northwest–southeast.

Skeletal remains were scarce and only in two graves could an extended supine body position be inferred. In all other cases the bones were entirely disarticulated, fragmentary, or non-existent.

The use of fire was a common burial treatment at this site as evidenced by the charred skull fragment in Grave No. 4, and the charcoal and burned sediment noted in five of the eight grave pits.

Grave inclusions were found in only two graves and consisted of a single green nephrite knife fragment in Grave No.8 and a collection of 9 bone arrowheads, 10 chert arrowheads, 1 quartzite arrowhead, a single chert knife, and 1 nephrite axe/adze in Grave No. 2.

5.3 DISCUSSION

While previous discussions of mortuary variability in the Little Sea microregion have emphasized the similarities between mortuary sites in order to assign them to various culture-historical periods, the survey just presented reveals considerable variability both within and between sites in such important areas as size, demography, topographic location, spatial organization, body position, burial treatment, and the types and quantities of grave inclusions (Tables 5.11–5.12). In this discussion I focus primarily on cemetery size, demographic structure, and intrasite spatial organization. Together these three attributes provide useful clues for interpreting the scale and character of the social unit that would have used the various cemeteries. I also very briefly discuss the distribution of a small number of artifact types.

First, the 20 cemeteries varied considerably in terms of size. KN XIV was, by far, the largest of all the sites with 78 Bronze Age graves containing 88 individuals. At the other end of the spectrum four sites are known from only a single grave, and several others contained fewer than 10 features. Given that graves in this region are generally visible on the surface and that three of the next largest sites (Kurma XI, Uliarba, Sarminskii Mys) were completely excavated, the large size of KN XIV is not a product of excavation bias. One factor that almost certainly is important, however, is the relative duration over which each site was used. Unfortunately, the lack of chronological data for most sites makes this impossible to evaluate. The radiocarbon dates available from Kurma XI, which contains 21 Bronze Age graves, indicate that it was used for a relatively shorter length of time than KN XIV (Figure 5.2). However, the five dates from Sarminskii Mys, which contains only 13 graves, suggest that it was used for around the same duration as KN XIV (Figures 5.2, 3.11), indicating that site size is not entirely a function of duration.

Second, the demographic structure of the sites also varied. In Chapter 5, I suggested that the broad demographic distribution of individuals at KN XIV implied that it was a community cemetery. Given that the proportion of adults, adolescents and children at Uliarba is not statistically different from that at KN XIV ($x^2[2]=2.24$, $p=\underline{0.327}$), it would appear that this site may also represent a community cemetery. As noted above, there are also a number of other similarities between the two sites including internal organization, treatment of children, and the existence of spatially segregated clusters containing what appear to be individuals of higher status. Interestingly, this was not the case for all sites.

In particular, Kurma XI contained no individuals older than 50 years of age and no individuals younger than 15 years. In some sense, then, membership in Kurma XI was more exclusive than at Uliarba or KN XIV. Similarly, Shamanskii Mys on Ol'khon Island contained only adults, with the exception of a single child who may have been killed for the occasion as evidenced by the arrowhead embedded in his/her scapula. While age appears to have been important in evaluating who would be buried at these sites, sex was less important. Of the individuals for whom sex could be estimated at Shamanskii Mys the sex ratio was 50:50. At Kurma XI, there was a male to female ratio of around 70:30; however, estimates of sex were not possible for almost 40% of the individuals, and a binomial test indicates that the difference is not statistically significant (binomial[14]; p=0.267).

In contrast to both of these sites, at Shide I over half of the individuals for which age could be estimated were children. It should be recalled that all of the graves at this site were also determined to be sitting burials, making this cemetery entirely atypical for the region. It is unclear to what we should attribute this uniqueness.

Unfortunately, demographic patterns are difficult to assess at other sites either because of a small sample size or missing data. For example, Ulan-Khada IV contained only two children; however the researchers noted that a number of small surface pavings could represent the graves of infants in which skeletal remains did not preserve. The same situation exists at Sarminskii Mys, where a number of features are variously referred to as infant graves, cenotaphs, or ritual structures, depending on the publication.

Third, although a number of sites contained general clusters of graves, only Uliarba exhibited unambiguous rows. Khadarta IV also contains what might be considered incipient rows, but it is difficult to see how such a notion could ever be tested. While at some cemeteries the absence of rows might simply be a product of the small number of graves, there also appears to be a structural difference between those sites with rows and those without, regardless of site size. This is most clearly demonstrated by comparing the site plans of Uliarba (Figure 5.3) and Kurma XI (Figure 5.18), both of which contain a roughly equivalent numbers of Bronze Age graves (27 and 24 respectively).

At Uliarba, as at KN XIV, there is an obvious "centre" to the cemetery in which the bulk of the graves are densely packed within several rows and files. At Kurma XI, in contrast, no obvious centre can be identified and graves are instead distributed within just a single file following the contour of the slope. The different spatial patterns strongly suggest that these sites developed in fundamentally different ways. At Uliarba and KN XIV, a large proportion of graves were placed in direct association with specific existing interments, thus producing distinct rows. This seems to agree with the suggestion made above that these sites may represent community cemeteries, in which case rows could define kinship affiliations (Okladnikov 1955). Likewise, the lack of such rows at Kurma XI, along with the exclusionary demographic profile, suggests that this site manifests different social distinctions. At the moment the nature of these distinctions is unclear; however, as discussed above, preliminary examination of the artifact assemblages from graves at Kurma XI suggests that, on average, these individuals possessed larger, more diverse, and more unique grave goods than individuals from other sites in the region. As such, it might be the case that Kurma XI represents a specialized cemetery for individuals of a higher status. It is difficult to determine, however, why some high-status individuals were apparently interred at community cemeteries (e.g., east cluster at KN XIV, northeast cluster at Uliarba), while others would have been interred in specialized cemeteries.

Finally, cemeteries varied with respect to the quantity and diversity of artifact types. It should be noted, however, that these data are examined here with some hesitation. I was not able to examine any of the artifacts directly, and in only very few cases were line drawings even available. As such, I was unable to confirm typological assignments and was forced to rely on the usually vague descriptions provided in the publications cited above. The fact that these reports were written by a variety of researchers in different times and at different levels of detail, virtually guarantees that there will be discrepancies in how artifacts were described. This is especially the case for the distinctions between such items as bone points and fleshers, or knives and bifaces, which are often simply matters of the scale of reported detail. When these factors are combined with the small sample sizes, it was clear that statistical methods would be inappropriate. Nevertheless, it was still possible to identify a few interesting trends for a small number of items.

First, Shamanskii Mys, which was previously identified as an exclusionary cemetery in terms of its demographic profile and ritual seal deposits, exhibited a much larger proportion of graves containing arrowheads, nephrite axes/adzes, nephrite discs, and nephrite rings than any of the other sites. It should be recalled that Okladnikov and Konopatskii (1975:304) interpreted this site as a specialized burial ground for high status individuals who may have been distinguished by their exceptional hunting and sealing abilities. As mentioned already, preliminary observations of Kurma XI suggest that it, too, may be atypical in its artifact diversity and abundance.

Next, two sites are distinctive for containing items that are only rarely found at other sites. First, almost half of the graves at Ulan-Khada IV contained a boar tusk pendant/blade. With the exception of a single grave at Kurma XI (Metcalf n.d.), no items of this sort have been reported from other Bronze Age graves in this area. Second, with the exception of a single grave at Uliarba, KN XIV is the only site to contain cylindrical beads. Even more remarkable is that half of the graves at KN XIV contain beads, and it should be recalled that they were all found in the centre cluster. Likewise, KN XIV was the only cemetery to exhibit extensive use of fire and, again, this was a character of the site's centre cluster. At present it is unclear how we should interpret these patterns except to conclude that the centre cluster of KN XIV is not only unique within the context of the site itself, but it also is unique within the entire region.

5.4 CONCLUSIONS

Overall, it is abundantly clear that the structure of mortuary variability documented at KN XIV in the previous chapter is not replicated in any direct or straightforward way at other sites in the region. To the contrary, in many respects KN XIV seems unique. It is, for example, by far the largest of all the sites, and it exhibits the most conspicuous and consistent spatial organization. KN XIV also seems to include in abundance at least two features that are only rarely found at other Bronze Age sites in the area—cylindrical beads and extensive use of fire. However, the same kinds of individuality can also be seen at virtually every other Bronze Age mortuary site examined: Kurma XI contained no children or old adults, Shide I is comprised of only sitting burials, Shamanskii Mys contains relatively few individuals, but they were all well furnished with grave inclusions, Ulan-Khada IV exhibits considerable variability in grave type and burial treatment, but individuals were relatively poorly furnished with artifacts.

At the same time, there is also a broad range of similarities that unite all of the sites within a coherent whole. For example, grave orientation seems to be broadly consistent between sites; children at most sites tend to be associated with multiple graves; the vast majority of grave inclusions are not exclusive to any one cemetery, although they are variably distributed both within and between sites; certain unique items such as the nephrite lunar pendant are found at multiple sites and in similar contexts (i.e., well furnished female graves); at many sites, individuals distinguished by particularly large and diverse grave inclusions were also distinguished through spatial separation from other graves; and of course radiocarbon dates demonstrate that at least 5 of these sites were directly contemporaneous.

It is obvious, then, that the Little Sea mortuary record does not reflect a situation in which individual communities were using single cemeteries. Instead, the picture appears to be rather more complicated, with Bronze Age hunter-gatherers maintaining a range of different types of mortuary sites. How such sites were used and in what contexts would have depended upon a wide range of social, political, economic and philosophical considerations. For the moment such considerations remain opaque; however, it was suggested that at least part of the variability might be explained by distinguishing between community sites such as KN XIV and Uliarba, and more specialized exclusionary sites such as Kurma XI and Shamanskii Mys. The basis for these status distinctions is unknown, but it appears that children were excluded, and that there may be a broad association with hunting abilities. Unfortunately, it remains an open question as to why some high status individuals were interred in specialized cemeteries while others were distinguished by spatial separation within community cemeteries (i.e., east cluster at KN XIV, northeast cluster at Uliarba). In the next chapter I propose another means of investigating the observed variability through the application of Cannon's (2002) theoretical framework in which the spatial representation of death is linked to distinctions between different types of memory.

Figure 5.1 Map of the Little Sea microregion indicating the location of all Bronze Age mortuary sites.

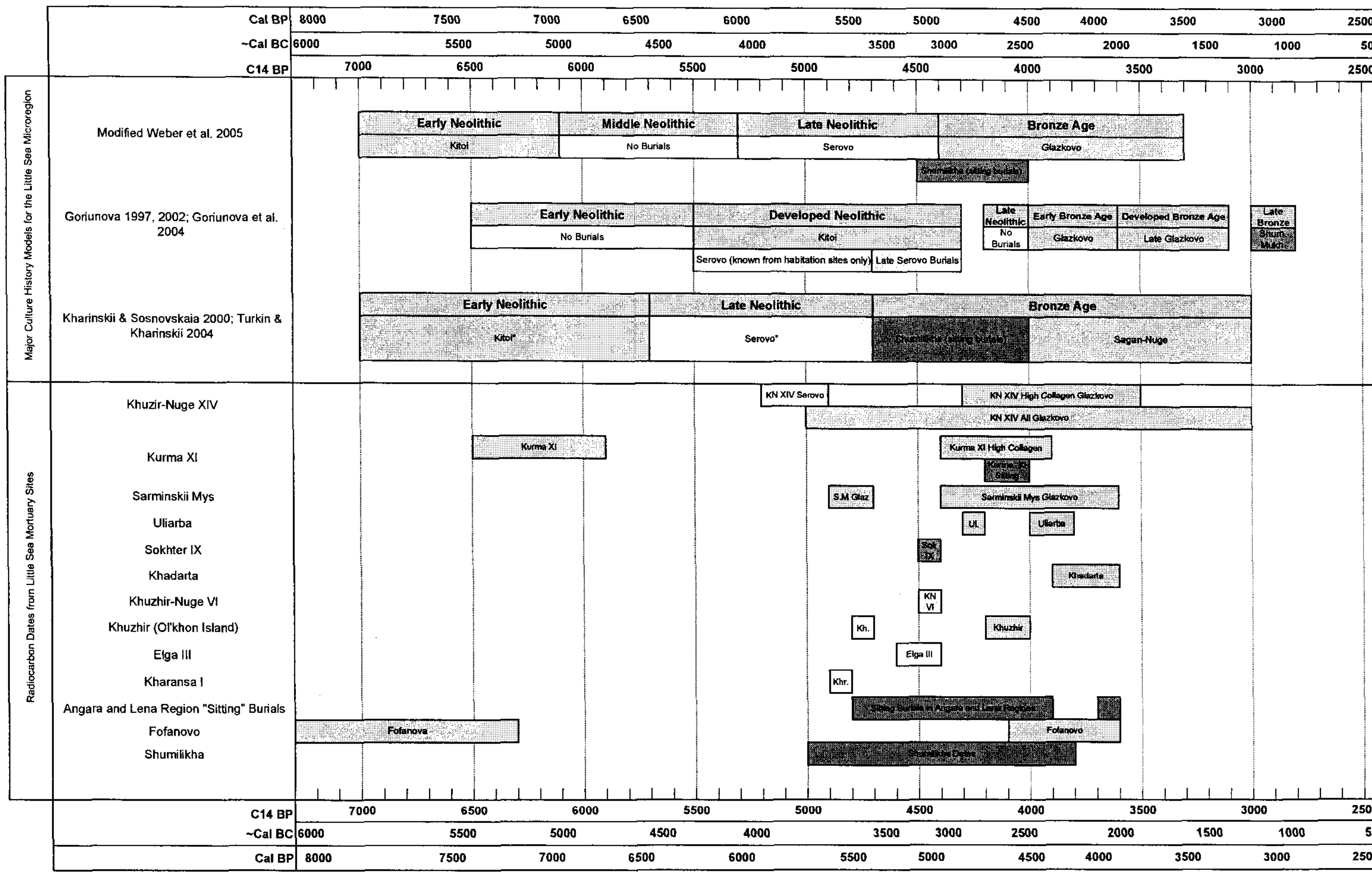


Figure 5.2: Major culture history models and radiocarbon dates from the Little Sea microregion

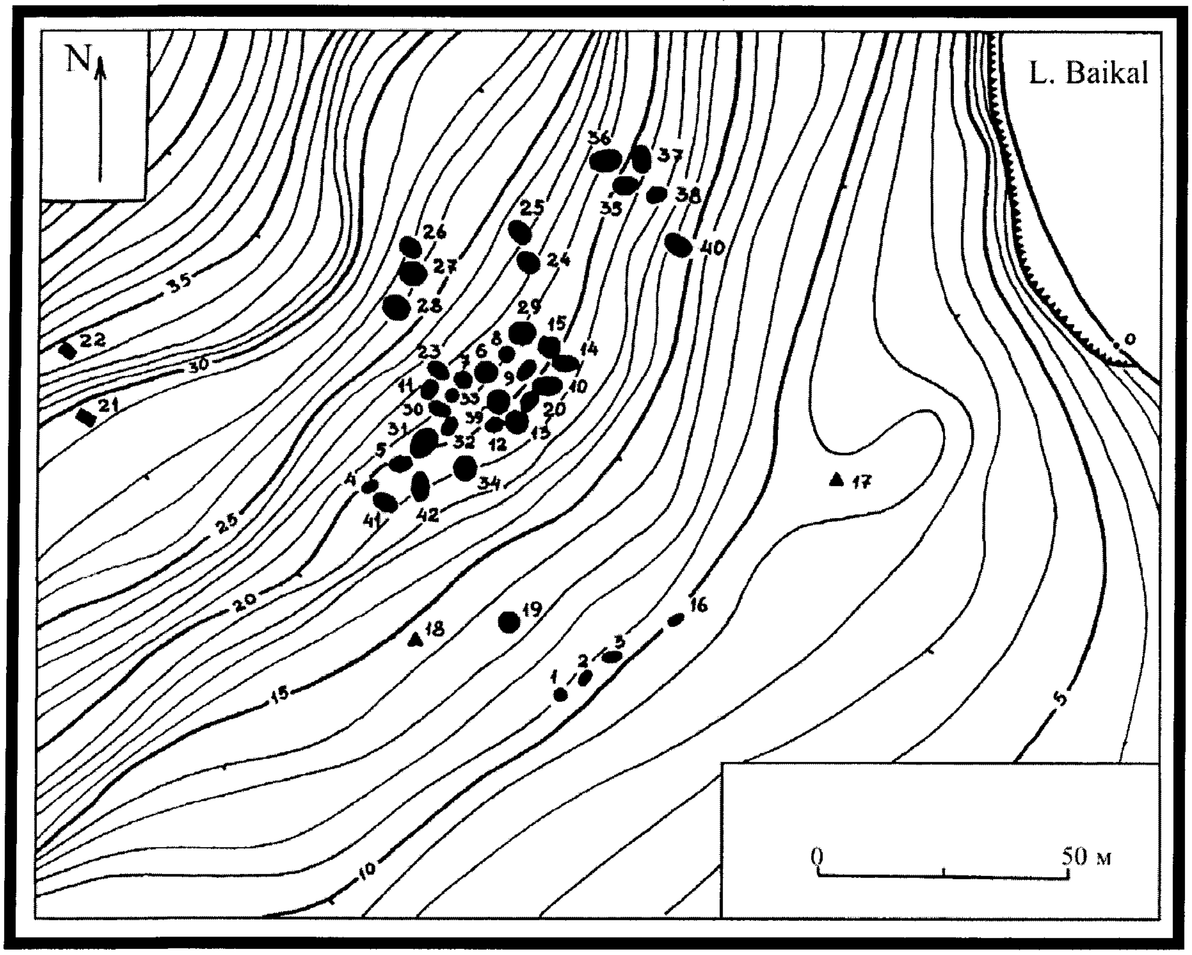


Figure 5.3: Site plan of the mortuary site Uliarba (adapted from Goriunova 1997)

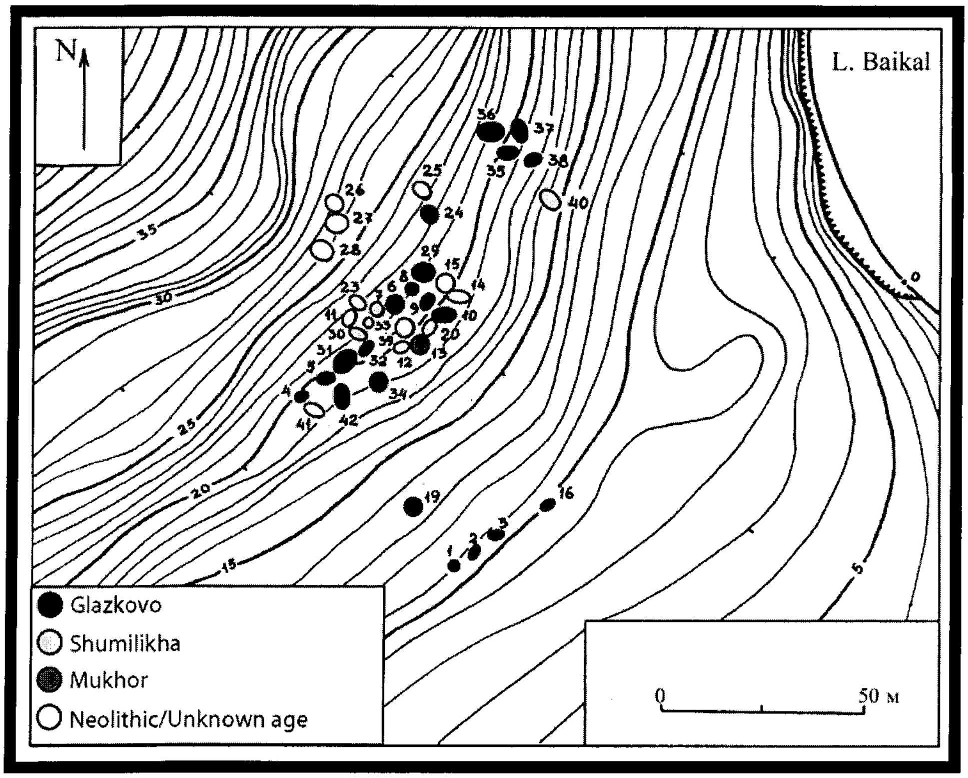


Figure 5.4: Locations of Late Neolithic, Bronze Age, and graves of unknown age at Uliarba

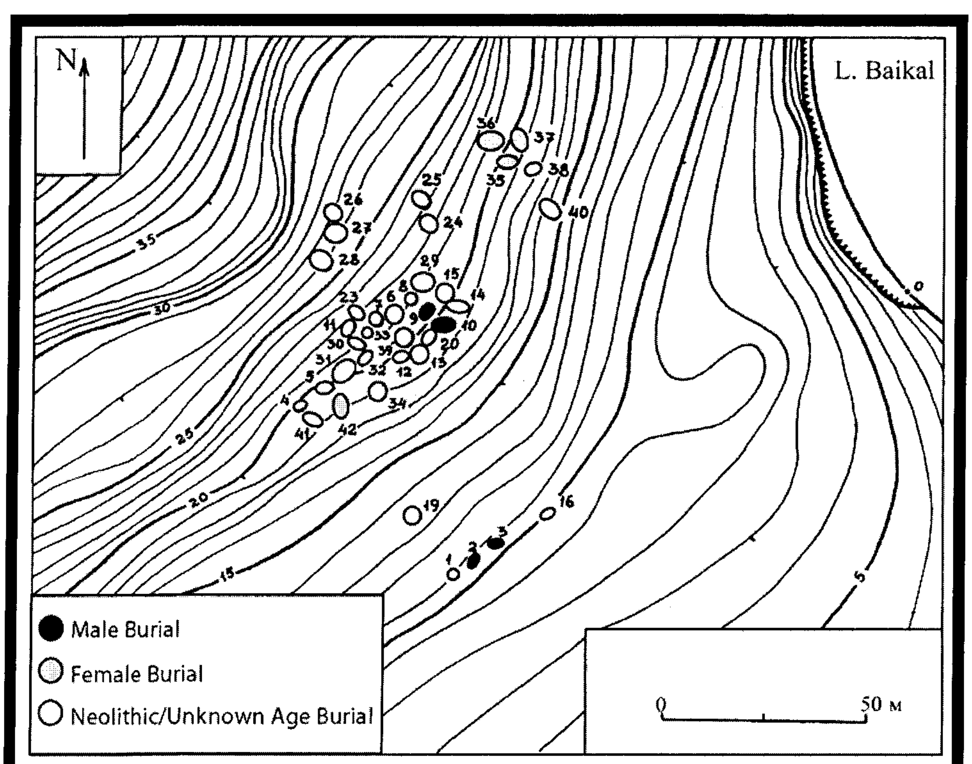


Figure 5.5: Locations of Bronze Age male and female graves at Uliarba

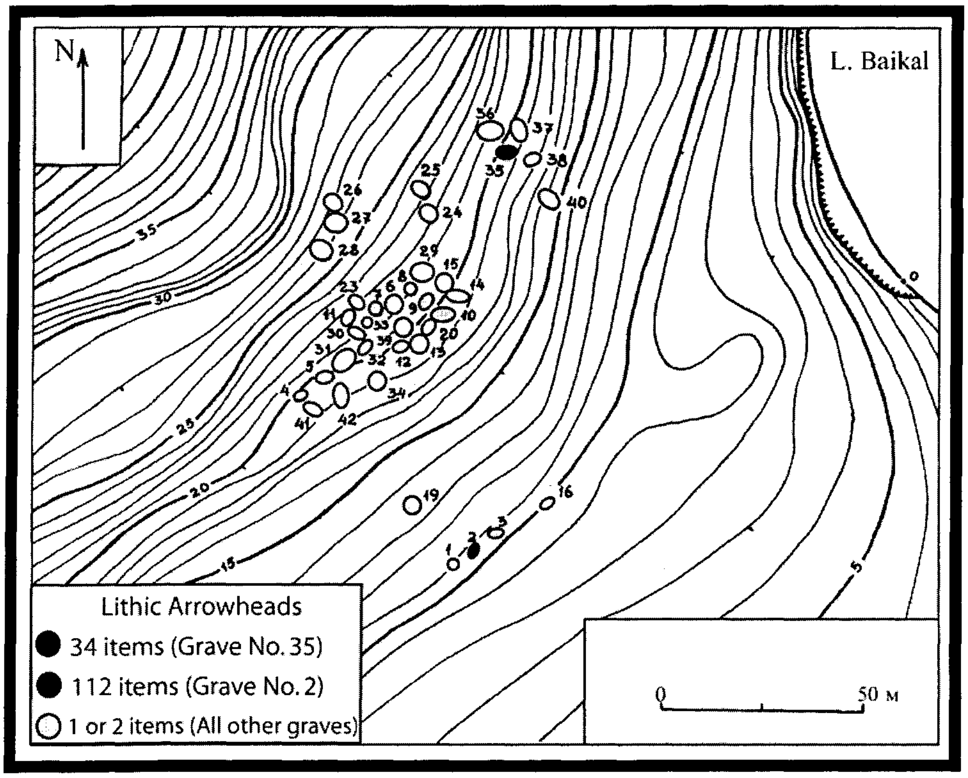


Figure 5.6: Locations of Bronze Age graves with lithic arrowheads at Uliarba

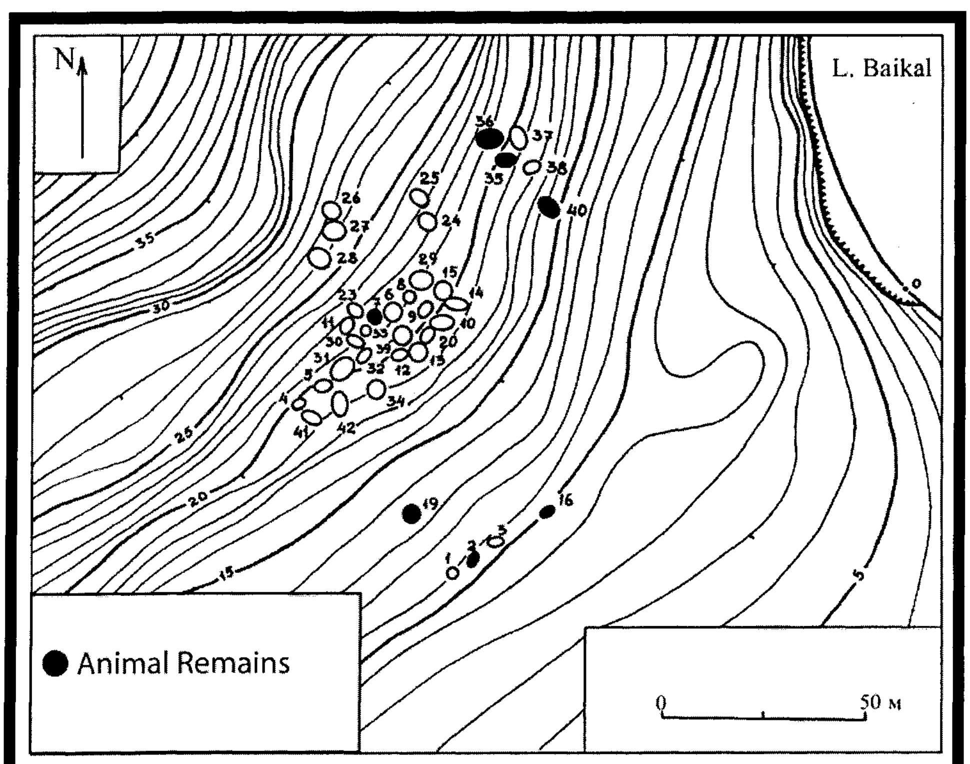


Figure 5.7: Locations of Bronze Age graves with unmodified animal remains at Uliarba

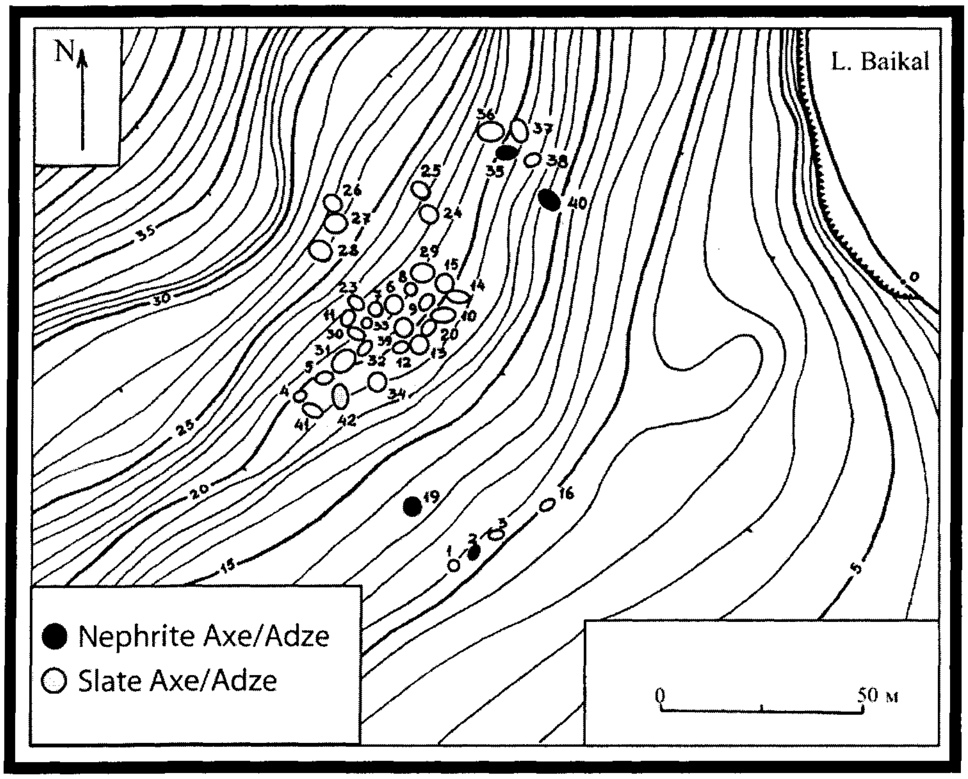


Figure 5.8: Locations of Bronze Age graves with ground stone axes/adzes at Uliarba

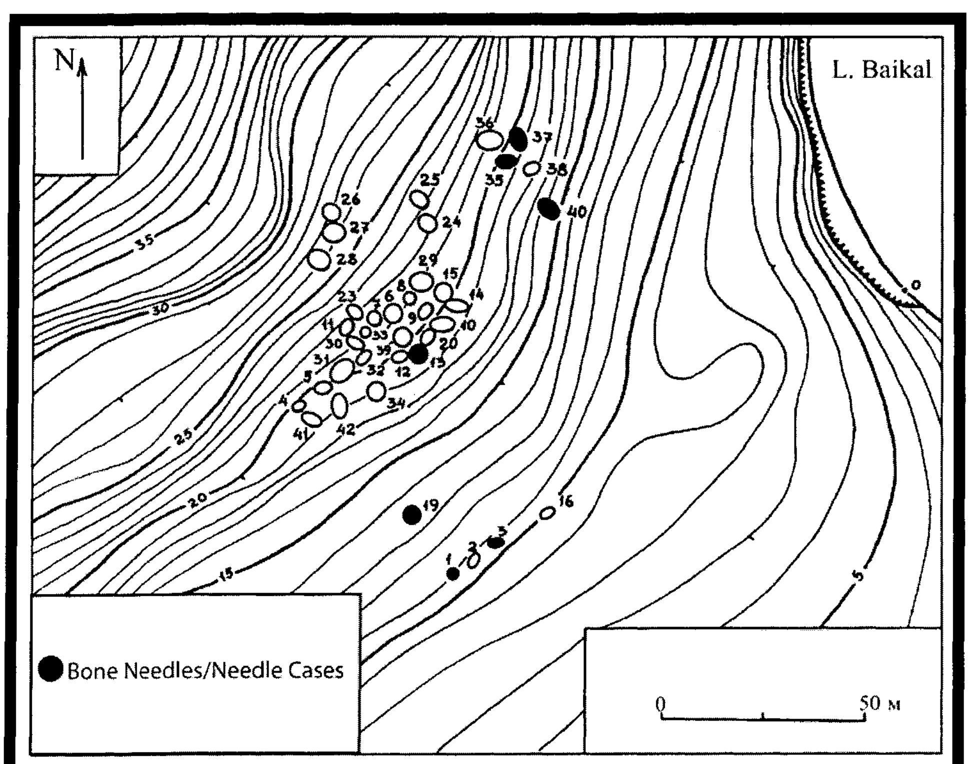


Figure 5.9: Locations of Bronze Age graves with bone needles/needle cases at Uliarba

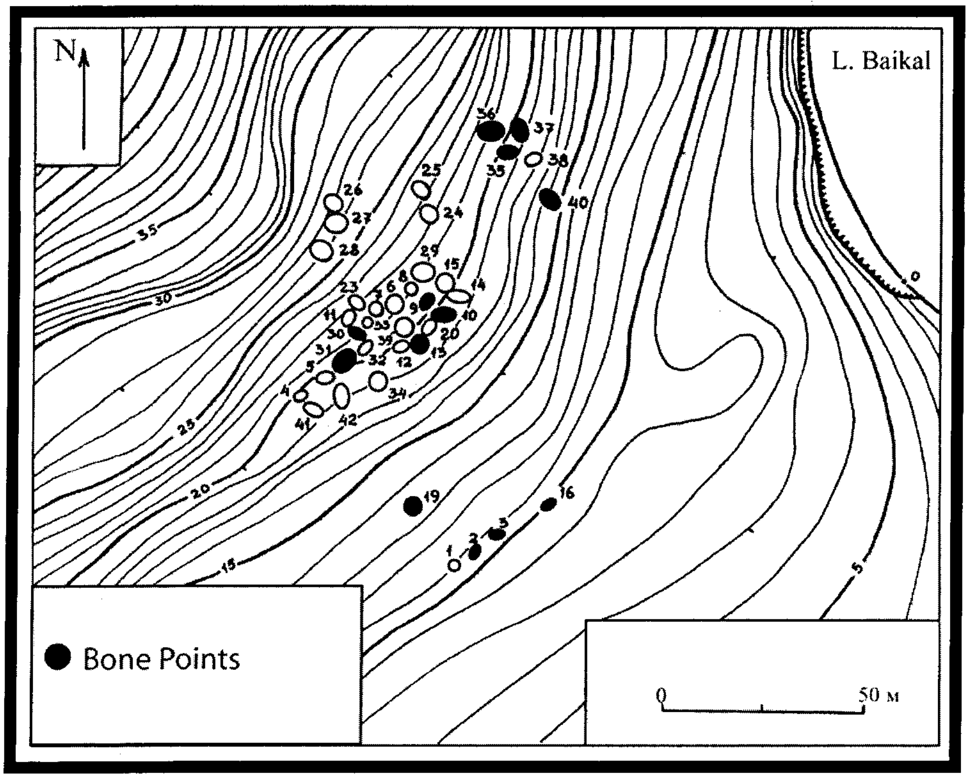


Figure 5.10: Locations of Bronze Age graves with ground stone rings/discs at Uliarba

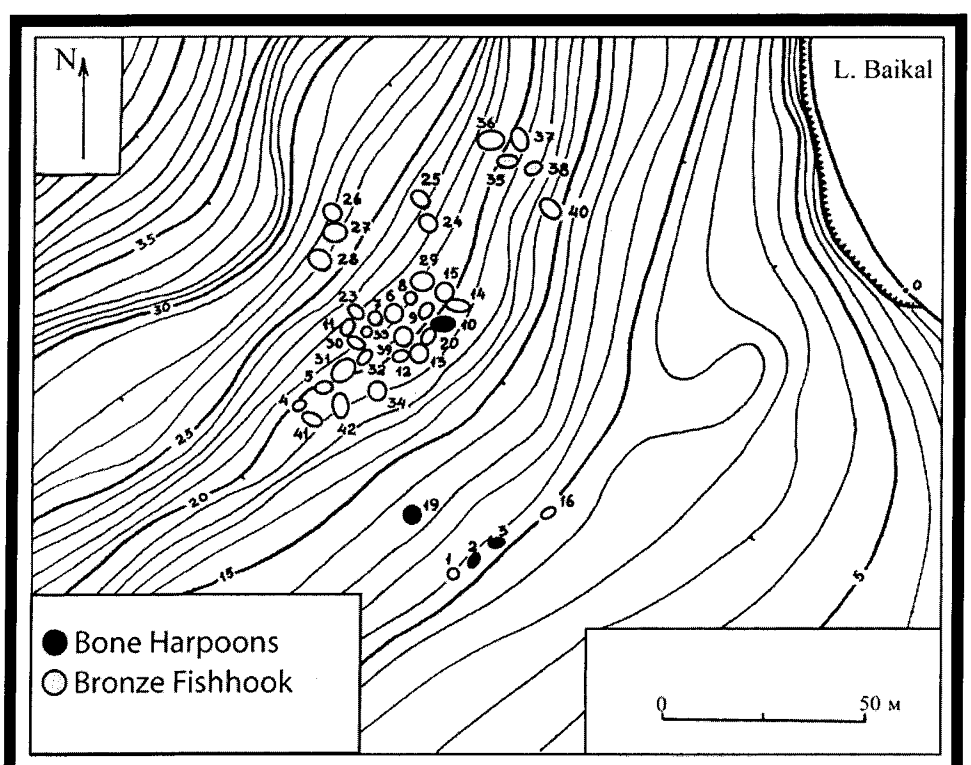


Figure 5.11: Locations of Bronze Age graves with fishing gear at Uliarba

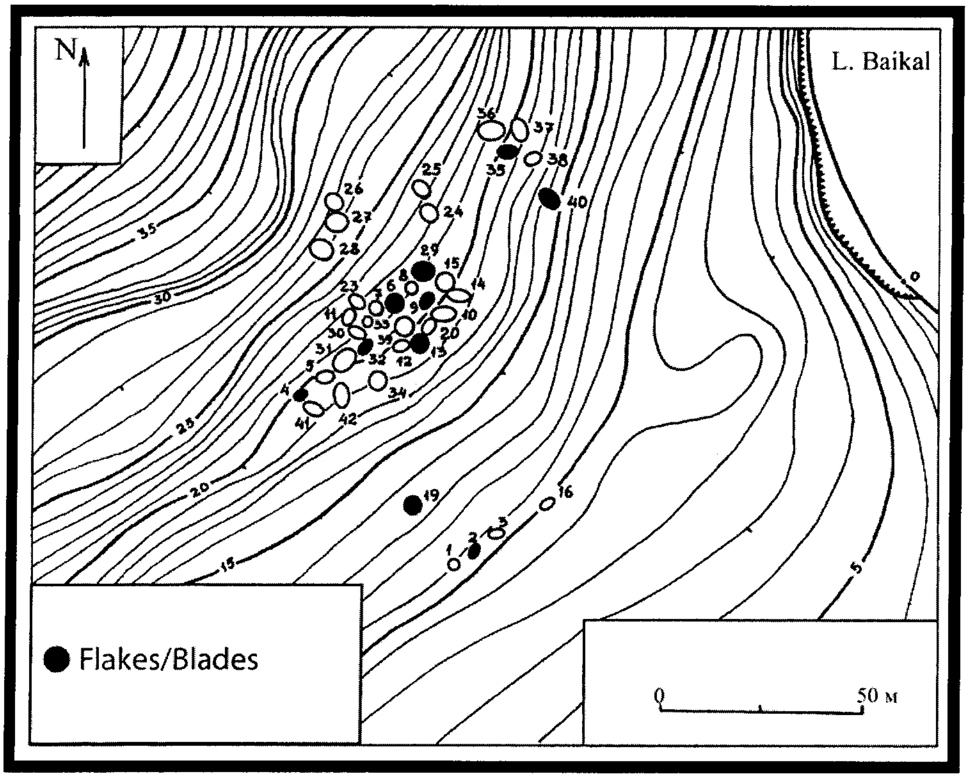


Figure 5.12: Locations of Bronze Age graves with lithic flakes/blades at Uliarba

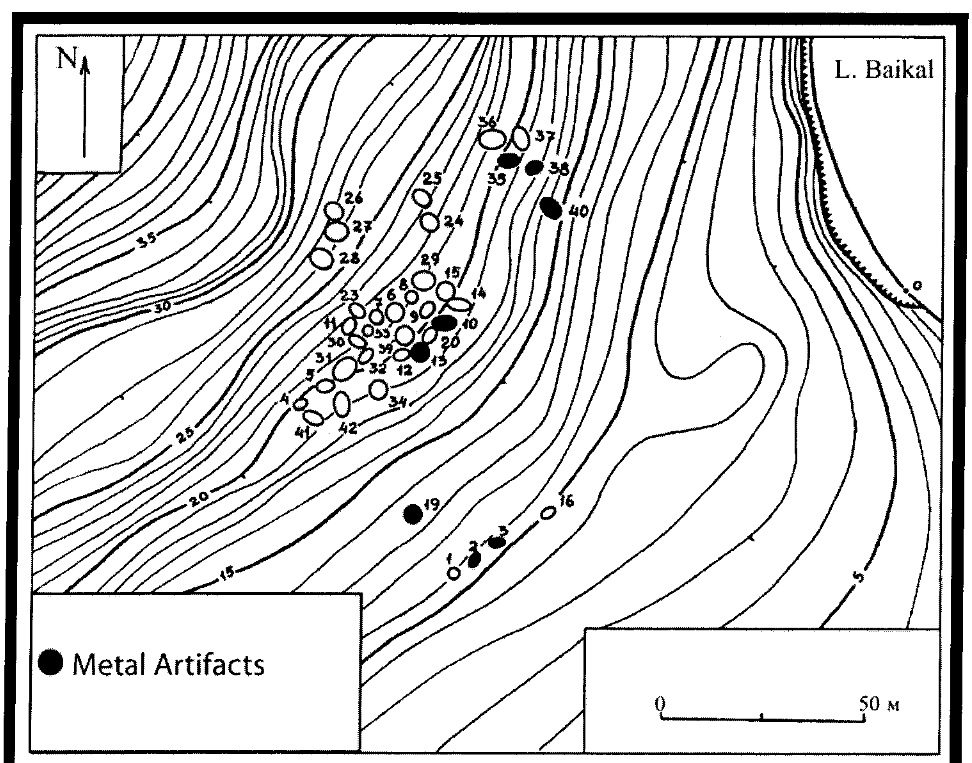


Figure 5.13: Locations of Bronze Age graves with metal artifacts at Uliarba

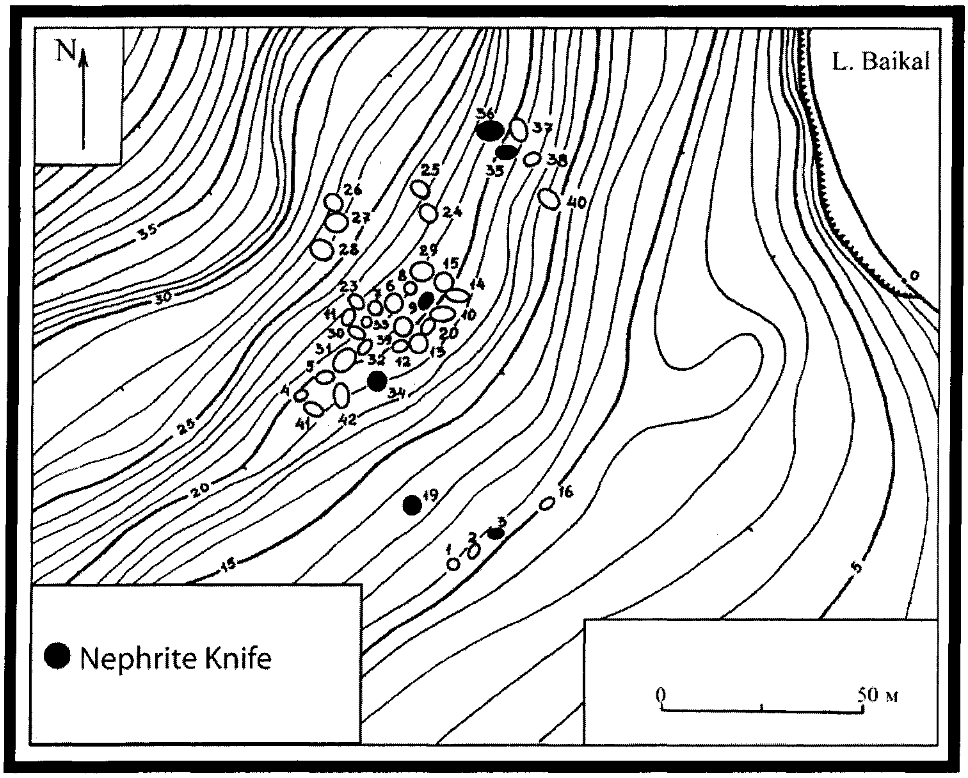


Figure 5.14: Locations of Bronze Age graves with nephrite knives at Ularba

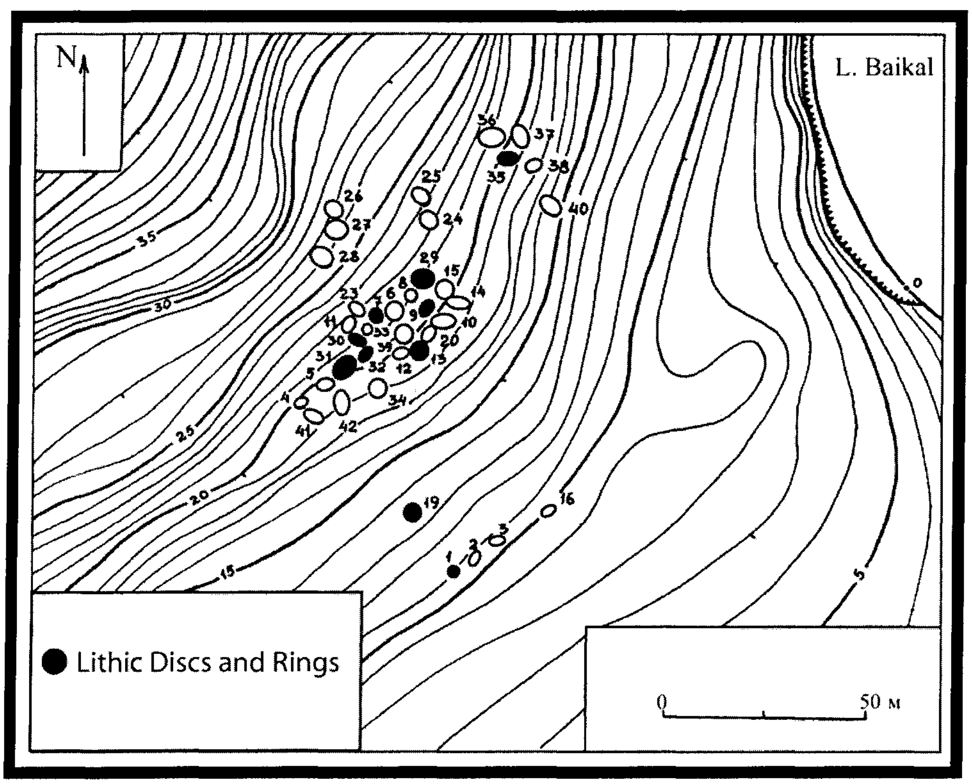


Figure 5.15: Locations of Bronze Age graves with ground stone discs and rings at Uliarba

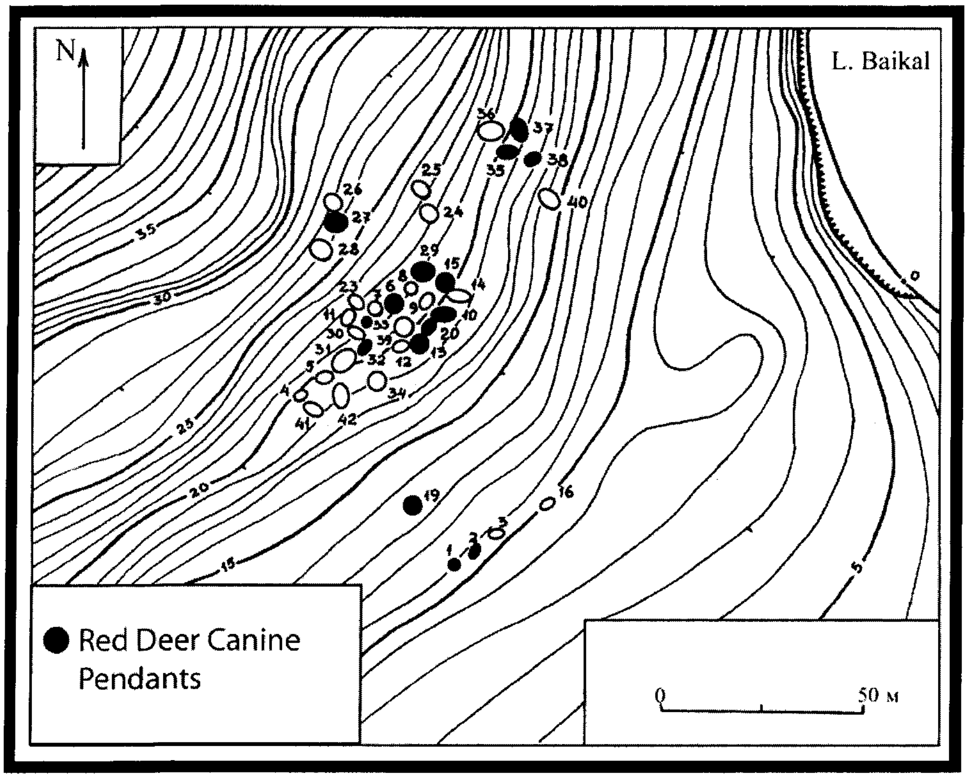


Figure 5.16: Locations of Bronze Age graves with red deer canine pendants at Uliarba

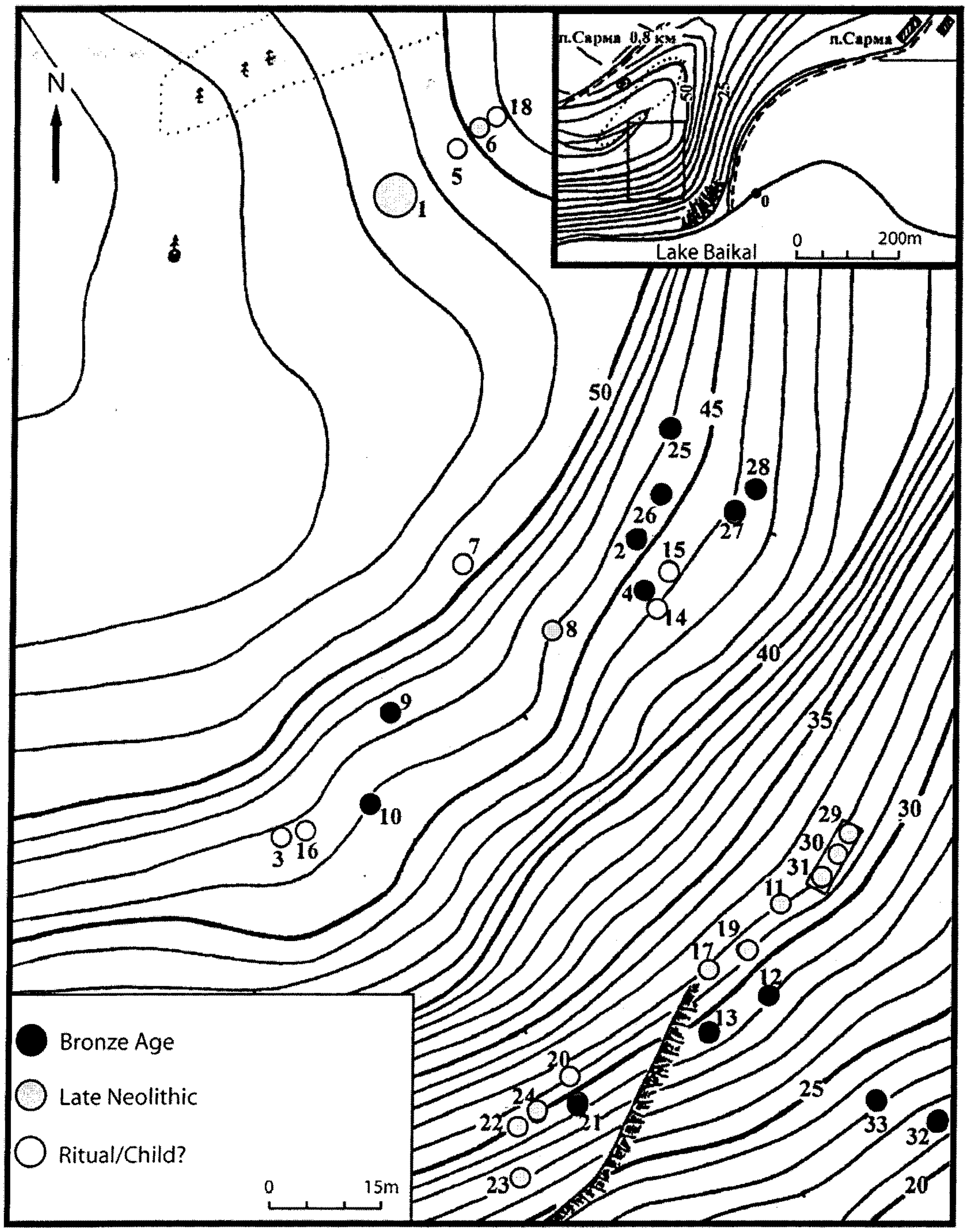


Figure 5.17: Site plan of the mortuary site Sarminskii Mys (adapted from Goriunova 1997)

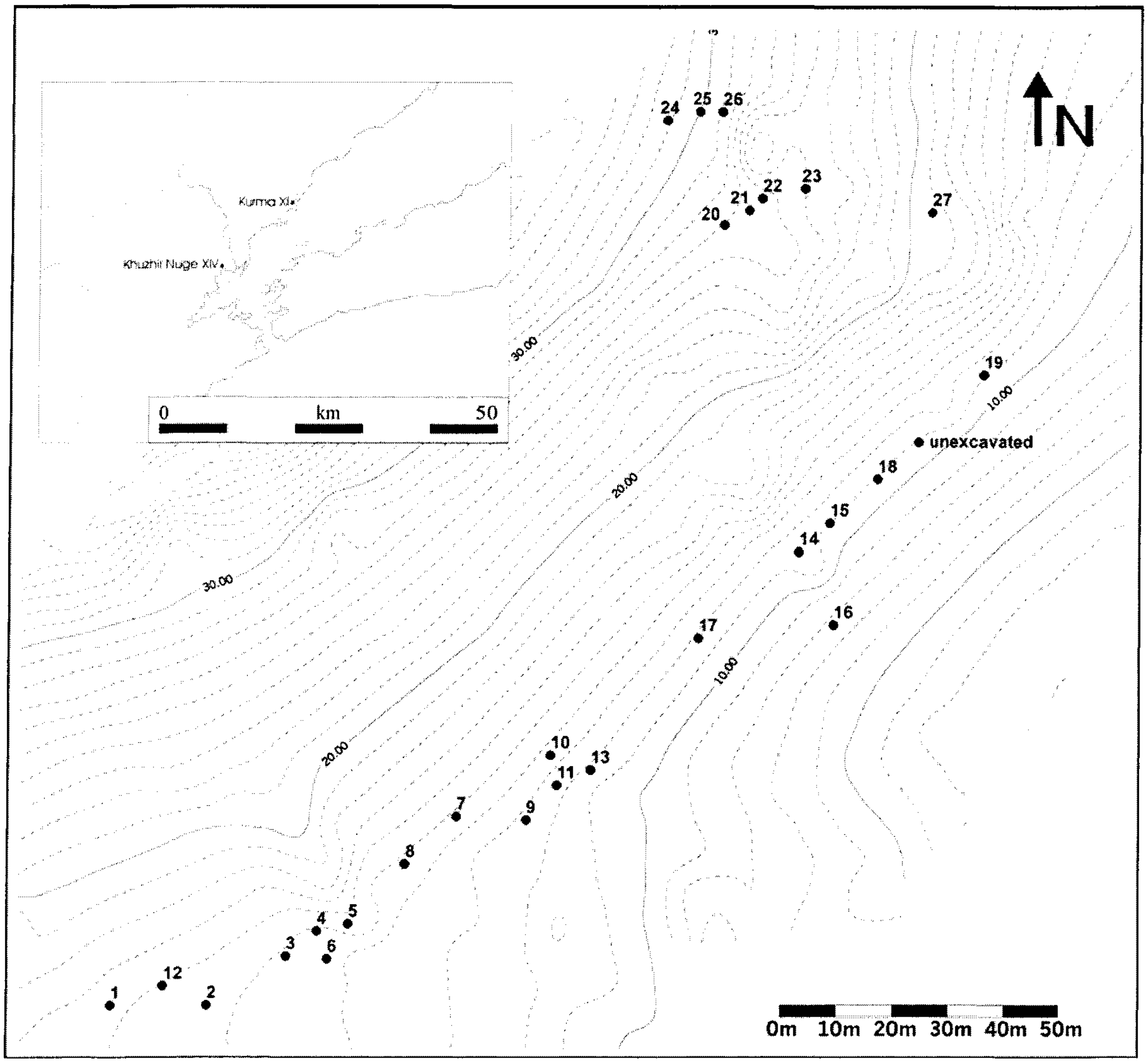


Figure 5.18: Site plan of the mortuary site Kurma XI

Figure 5.19: Photograph of Kurma XI excavations in progress (photograph: A. Weber, looking southeast)

Figure 5.20: Photograph of Kurma XI from the south (photograph: A. Weber)

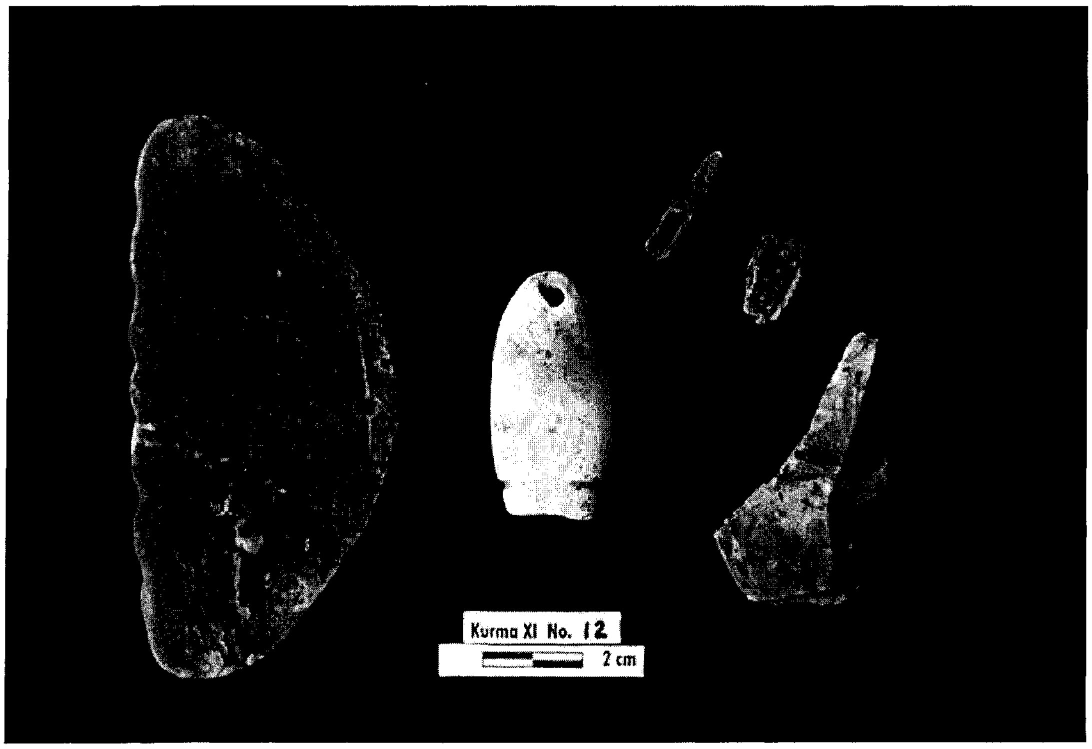


Figure 5.21: Photograph of the nephrite lunar pendant from Grave No. 12 at Kurma XI (photograph: A. Weber)

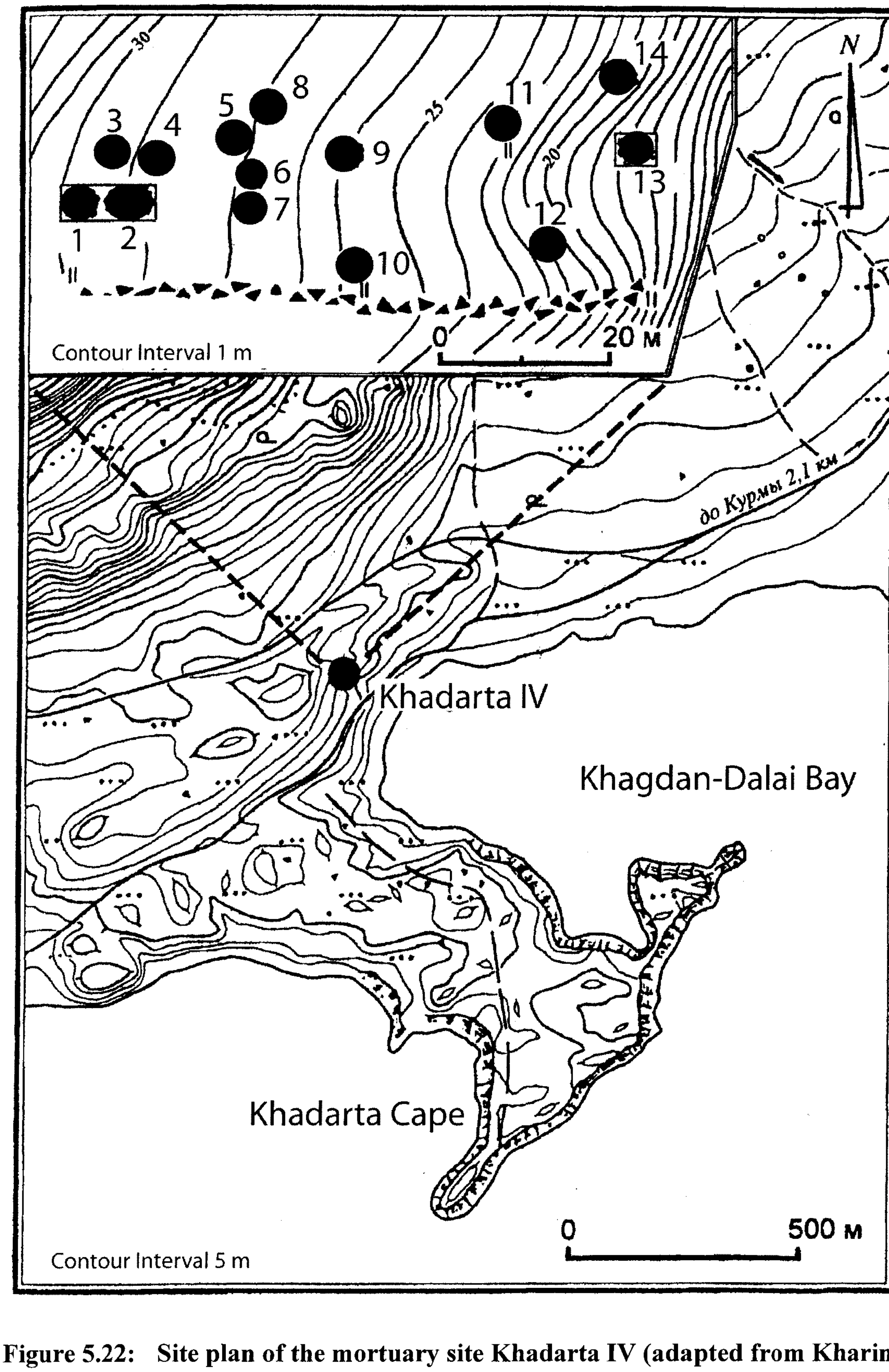
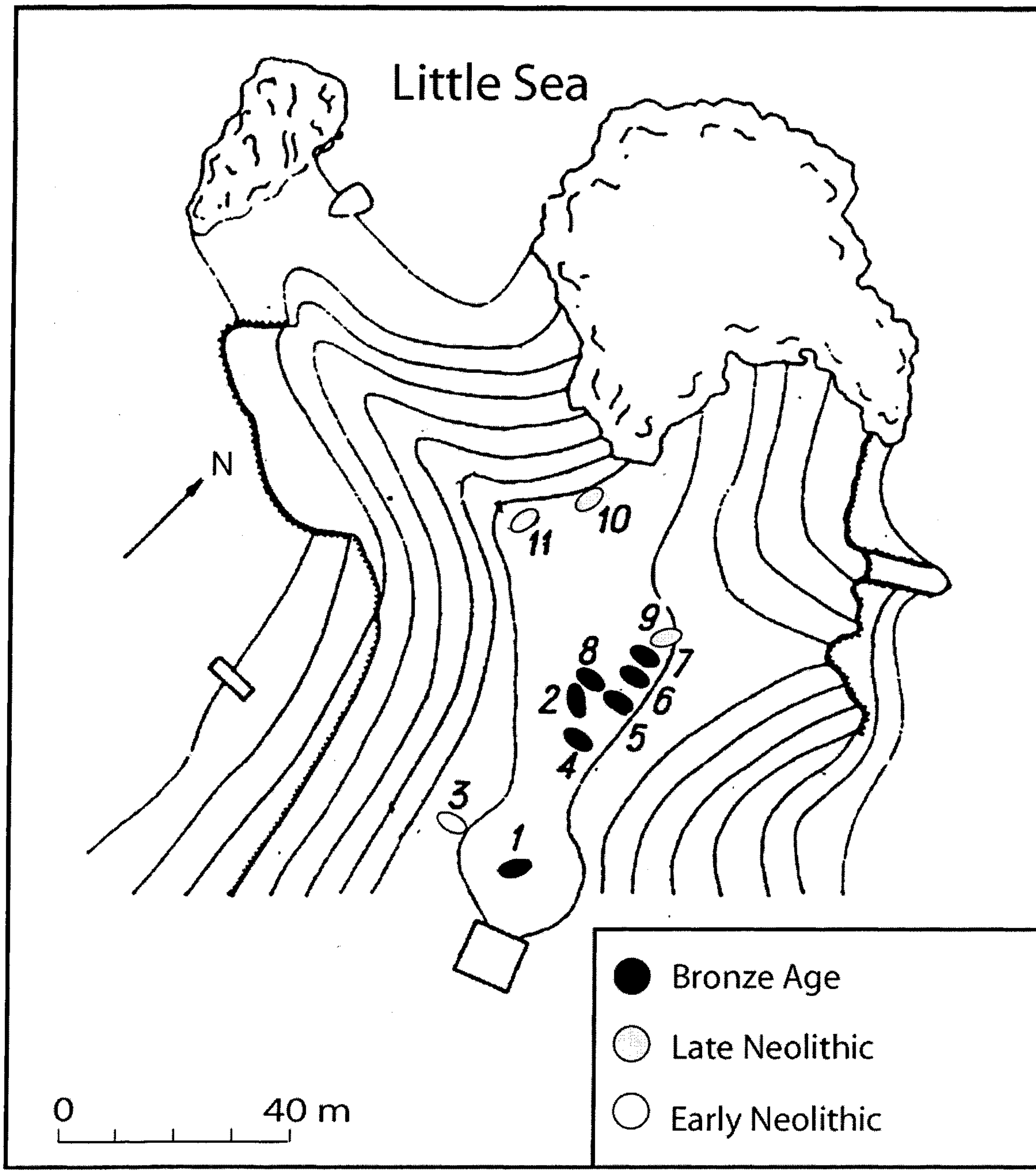


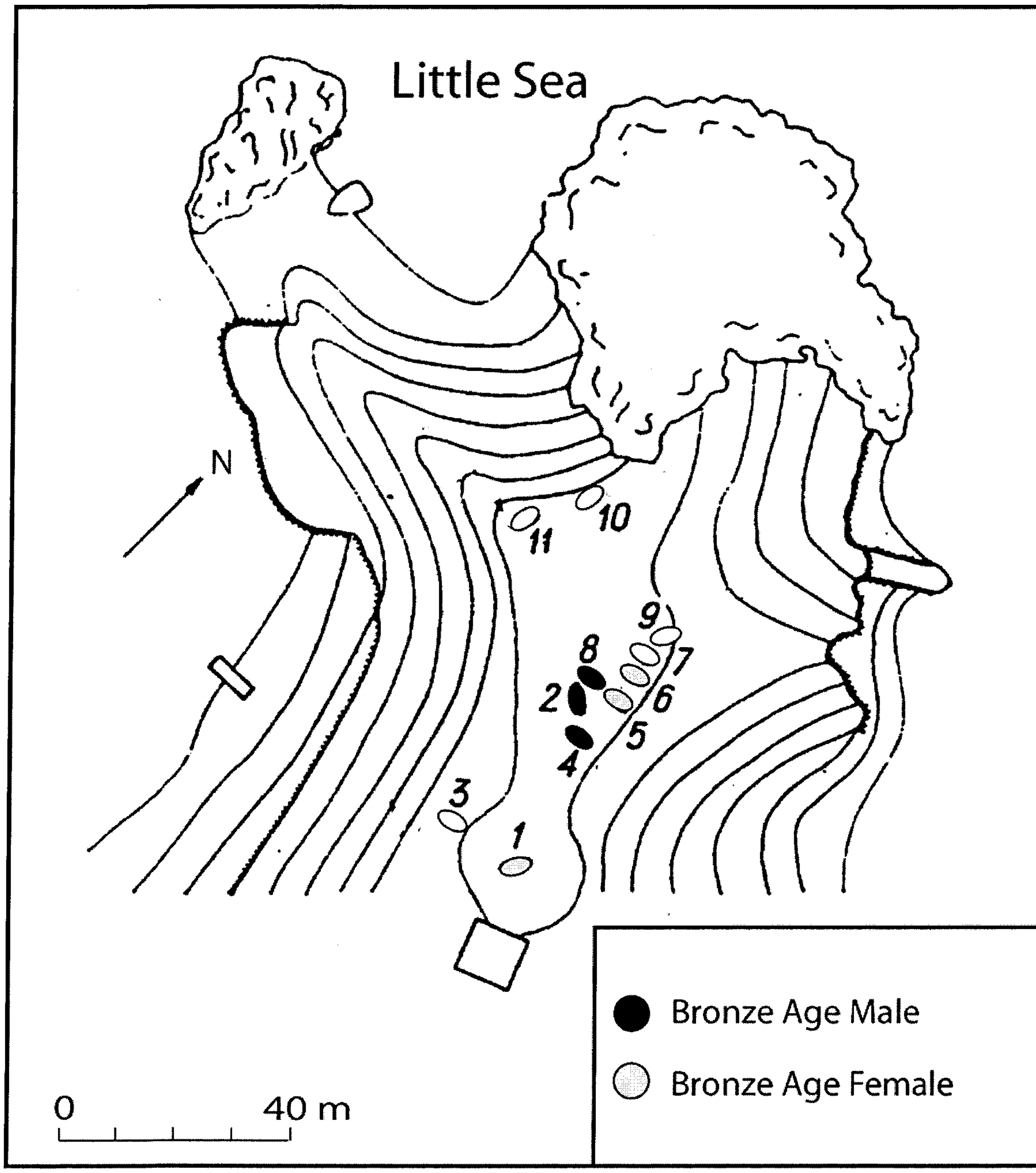
Figure 5.22: Site plan of the mortuary site Khadarta IV (adapted from Kharinskii and Sosnovskaia 2000)

Figure 5:23: View of Shamanskii Mys from the southeast (photograph: A. Weber)



Grave Nos. 1-3 = Grave Nos. 1-3 (1972)
Grave Nos. 4-7 = Grave Nos. 1-4 (1973)
Grave Nos. 8-10 = Grave Nos. 1-3 (1975)
Grave No. 11 = Grave No. 1 (1976)

Figure 5.24: Locations of Neolithic and Bronze Age graves at Shamanskii Mys (adapted from Konopatskii 1982)



Grave Nos. 1-3 = Grave Nos. 1-3 (1972)
Grave Nos. 4-7 = Grave Nos. 1-4 (1973)
Grave Nos. 8-10 = Grave Nos. 1-3 (1975)
Grave No. 11 = Grave No. 1 (1976)

Figure 5.25: Locations of Bronze Age male and female graves at Shamanskii Mys

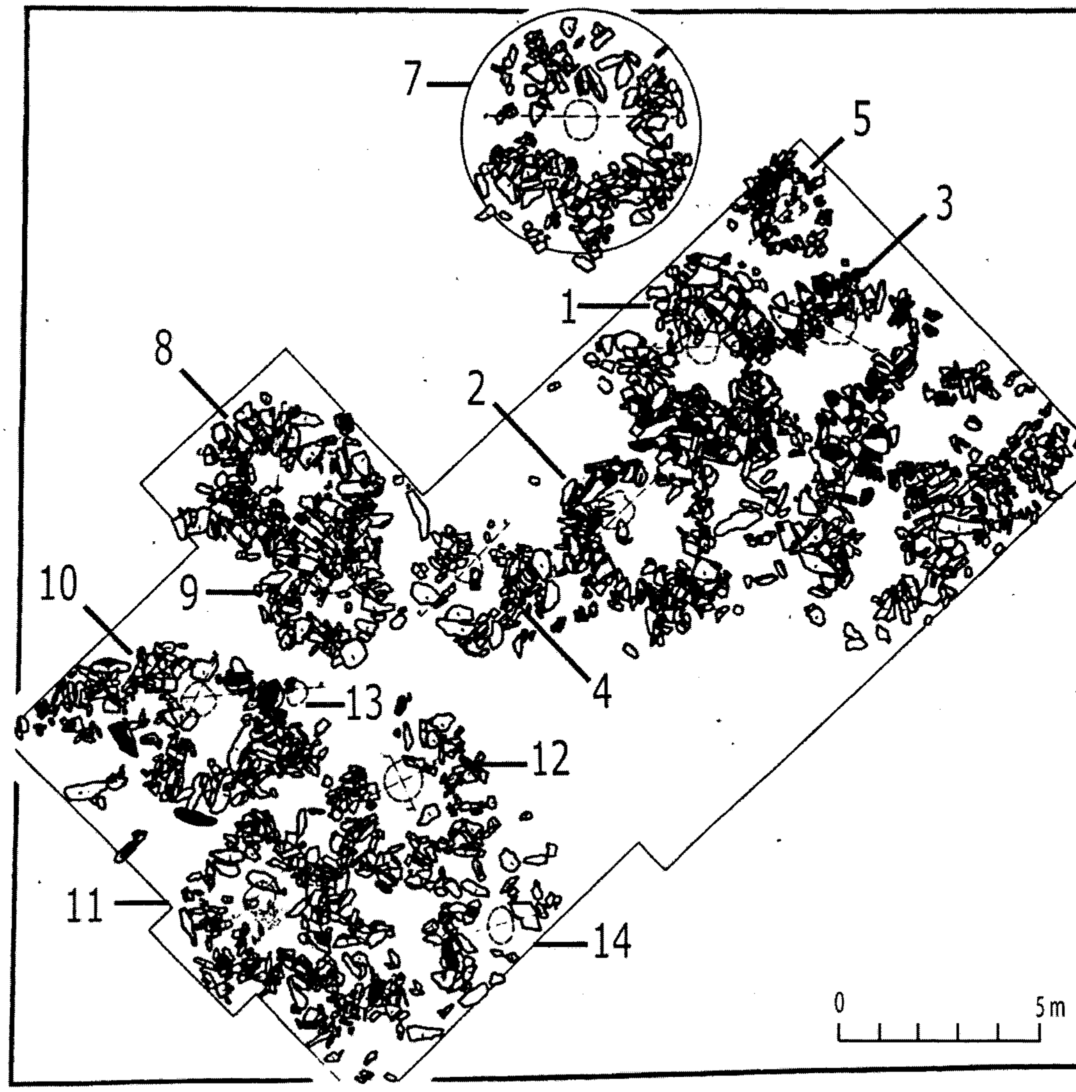


Figure 5.26: Site plan of the mortuary site Shide I (adapted from Gorbunova and Pshenitsyna 1986)

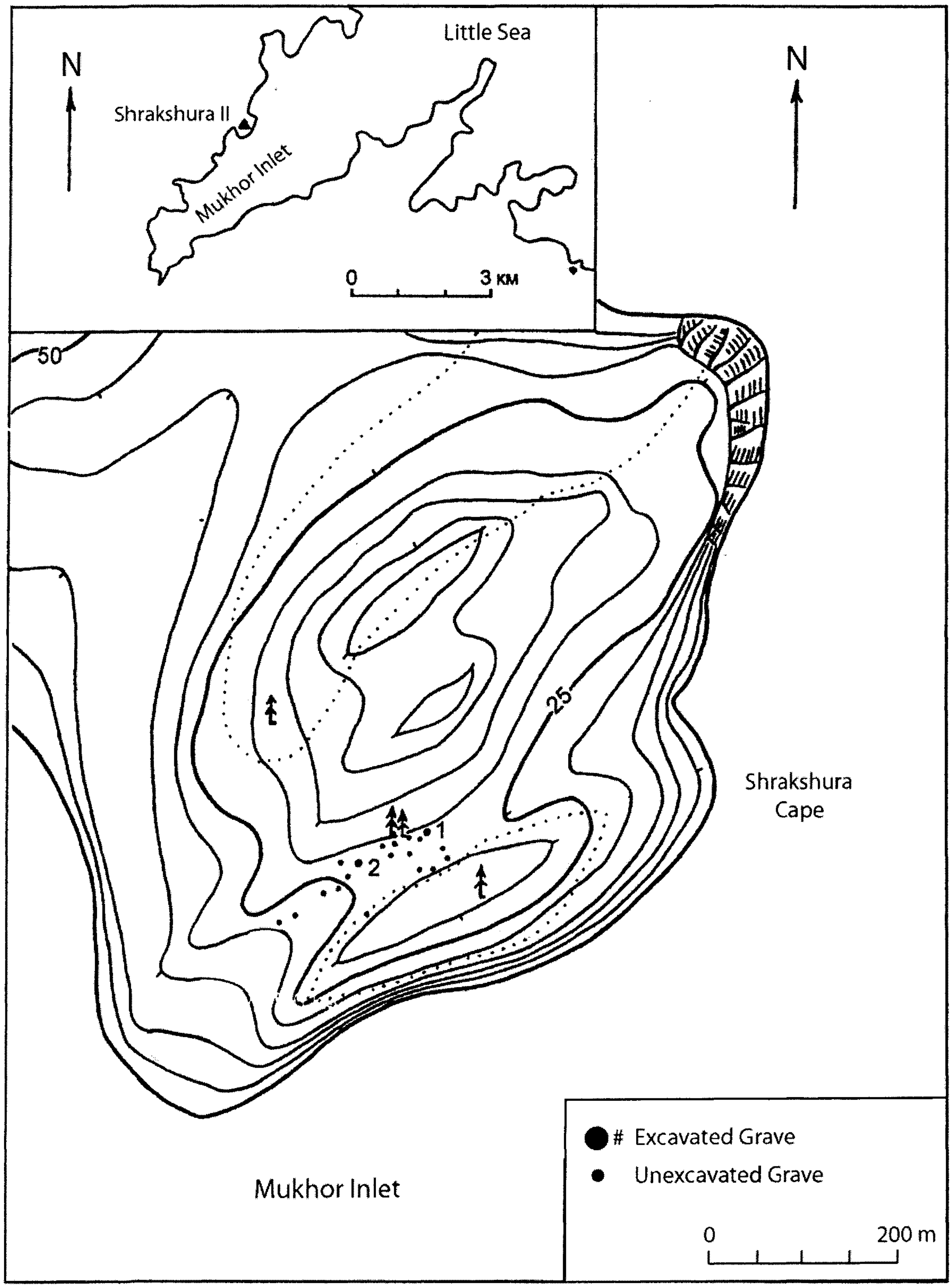


Figure 5.27: Site plan of the mortuary site Shrakshura II (adapted from Goriunova 1997)

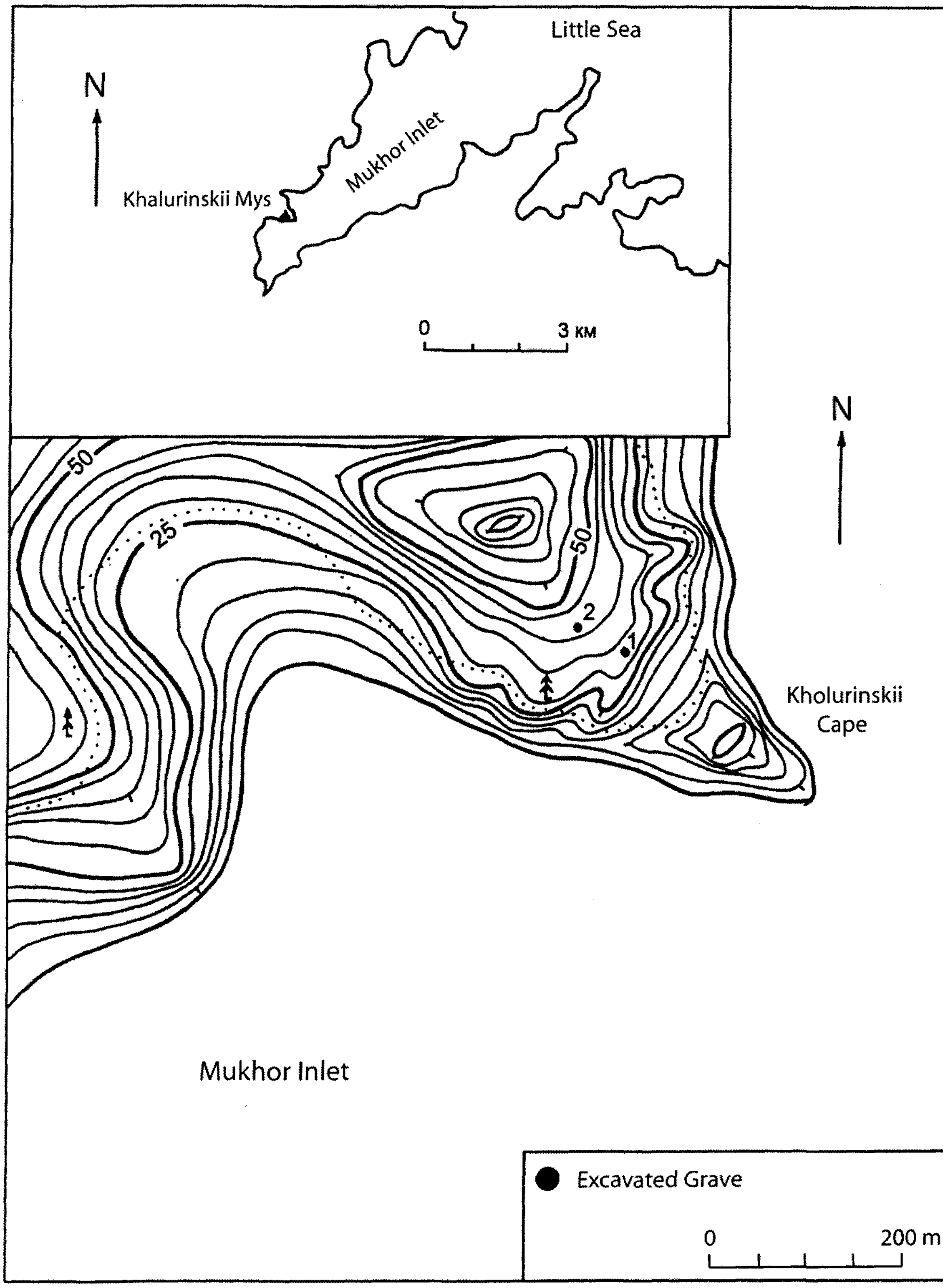


Figure 5.28: Site plan of the mortuary site Khalurinskii Mys I (adapted from Goriunova 1997)

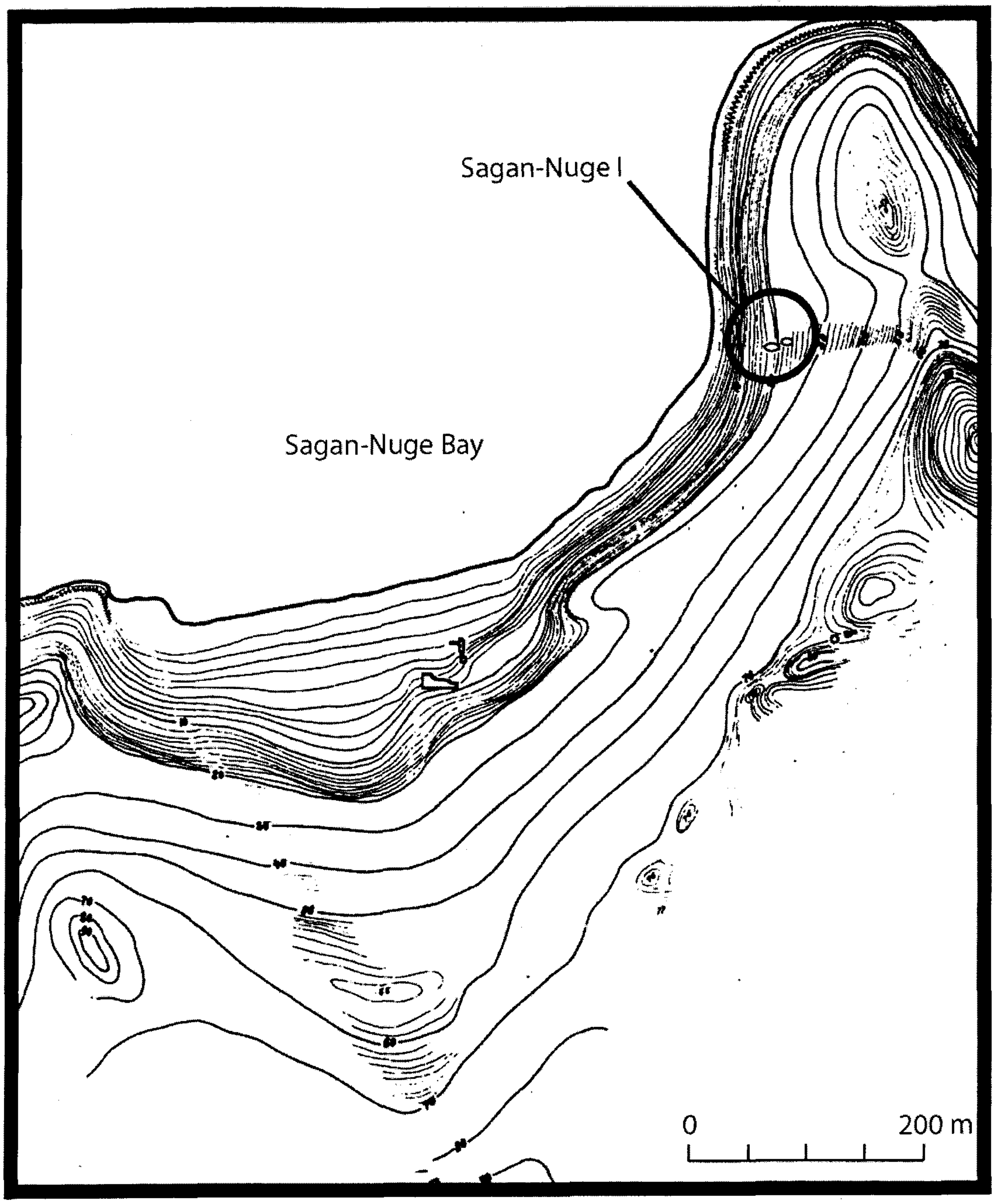


Figure 5.29: Map illustrating the location of Sagan-Nuge mortuary site (modified from Baruzdin et al. 1996)

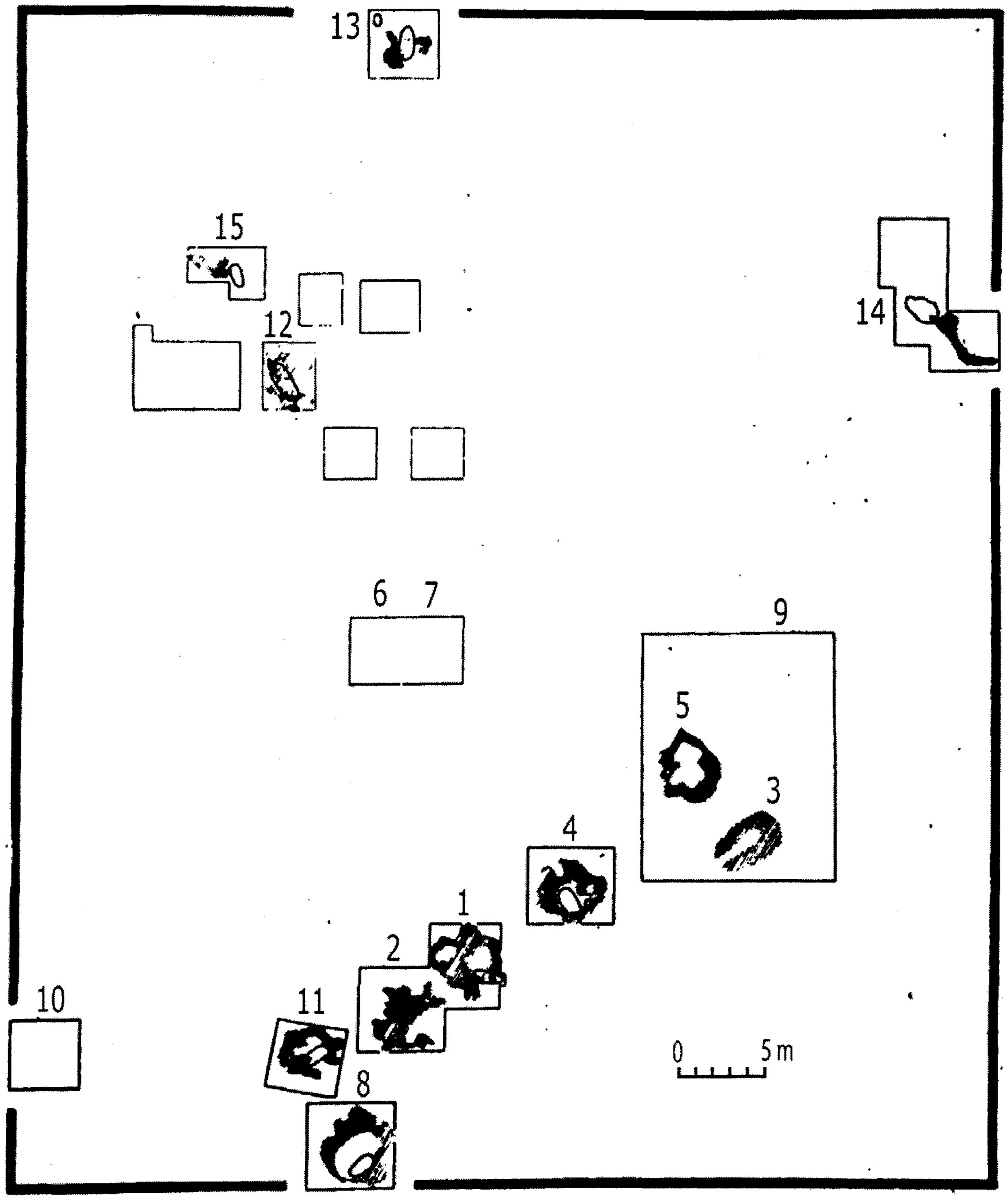


Figure 5.30: Site plan of the mortuary site Ulan-Khada IV (adapted from Komarova and Sher 1992)

Table 5.1: Bronze Age mortuary sites in the Little Sea microregion

Site Name	Number of Identified Bronze Age Graves
Guroo-Ushoon IV	1
Khadarta IV	14
Kharansin I - Ol'khon	8
Khalurinskii Mys	1
Khuzhir-Nuge XIV	78
Kurma XI	20
Ontokhoi	1
Sagan-Nuge I	1
Sarminskii Mys	15
Shamanskii Mys - Ol'khon	7
Shide I	14
Shide VIII	7
Shrakshura II	2
Sokhtyer IX	1
Sokhtyer VIII	1
Ulan-Khada II	6
Ulan-Khada IV	6
Ulan-Khada V	1
Ulan-Khada VI	1
Uliarba	27

Table 5.2: Summary of mortuary variability at Uliarba

Grave Number	Burial Number	Spatial Cluster	Mortuary Protocol (Goriunova et al. 2005)	Age (years)	Sex	Body Position	Grave Type	Burial Orientation
1	1.1	South	Glazkovo	0-6/7	-	Extended Supine	Triple - side by side	SWW
	1.2			0-6/7	-	Extended Supine		SWW
	1.3			0-6/7	-	Flexed Legs Supine		SWW
2	2.1	South	Glazkovo	14-18/19	Male	Flexed Legs Supine	Triple - side by side	SW
	2.2			14-18/19	Male	Flexed Legs Supine		SW
	2.3			0-6/7	-	Extended Supine		SW
3	3.1	South	Glazkovo	55+	Male	Flexed Legs Supine	Double - Side by Side	SW
	3.2			8-13	-	Flexed Legs Supine		SW
4	4.1	Centre	Glazkovo	-	-	Extended Supine	Single	SW
5	5.1	Centre	Glazkovo	-	-	Extended Supine	Single	SW
6	6.1	Centre	Glazkovo	-	-	Flexed Legs Supine	Single	SWW-W
8	8.1	Centre	Glazkovo	14-18/19	-	Flexed Legs Supine	Single	SW
9	9.1	Centre	Glazkovo	55+	Male	Flexed Legs Supine	Single	SW
10	10.1	Centre	Glazkovo	36-50/55	Male	Extended Supine	Single	SWW-W
16	16.1	South	Glazkovo	14-18/19	-	Flexed Legs Supine	Single	SW
19	19.1	South	Glazkovo	-	-	Extended Supine	Single	SW
24	24.1	North	Glazkovo	-	-	Extended Supine	Single	SW
29	29.1	Centre	Glazkovo	-	-	Extended Supine	Single	SW
31	31.1	Centre	Glazkovo	-	-	Extended Supine	Single	SW
32	32.1	Centre	Glazkovo	-	-	Flexed Legs Supine	Single	SW
34	34.1	Centre	Glazkovo	-	-	Extended Supine	Single	SWW-W

Table 5.3: Summary of grave inclusions at Uliarba

Grave number	Burial number	Objects found in upper levels	Implements associated with burial	Ornaments/Animal Bones associated with burial	Grave inclusions found between individuals in multiple graves
1	1.1	-	-	-	-
	1.2	Decorated tubular bone needle	-	3 red deer canine pendants, 4 small calcite discs[1]	
	1.3		-	-	
2	2.1	-	3 chert flakes; *Cluster 1* : 138 chert flakes/blades, 1 retouched blade, (2 scrapers, 112 arrowheads and associated fragments, 1 abrader)*	14 red deer canine pendants, 1 metal tube; *Cluster 1:* 2 musk deer canines	-
	2.2	-	-		
	2.3	-	1 bone awl	*Cluster 2:* 2 beaver mandibles, 1 fox mandible, 1 wolf mandible, animal bones, (~100 small round pebbles)*	*Cluster 2* : 2 chert flakes, 1 chalcedony drill, 1 chert knife, 2 nephrite axes, 1 bone harpoon, 1 bone point
3	3.1	Ceramic fragments in upper layers	1 chert arrowhead, 1 fragment of chert knife, 1 bone point, 1 bone harpoon, 3 antler fleshers, 1 bone rod, 1 tubular bone needlecase enclosing 7 needles, 1 lithic drill, 1 lithic biface-knife, 1 green nephrite blade, 1 fragment of chalcedony borer, 1 metal knife	-	-
	3.2		-	-	
4	4.1	Ceramic fragments in upper layers	1 chert flake	-	-
5	5.1	Ceramic fragments in upper layers	1 chert scraper; 1 chert spearhead	-	-
6	6.1	Ceramic fragments in upper layers	1 chert scraper, 1 chert flake	5 red deer canine pendants[2]	-
8	8.1	-	-	Rodent teeth	-
9	9.1	Ceramic fragments in upper layers	1 slate abrader, 1 green nephrite knife, 1 lithic arrowhead, 2 bone tool fragments, 1 chert tool fragment, 1 lithic spearhead, 1 retouched blade, 7 flakes/blades	1 white nephrite disc,	-
10	10.1	Ceramic fragments in upper layers	Ceramic fragments, 1 bone point, 1 bronze needle, 2 lithic arrowheads, 1 bone flesher, 3 harpoons and fragments of 5 bone arrowheads[4]	33 red deer canine pendants	-
14	14.1	Ceramic fragments; lithic blade in upper layers	-	-	-
15	15.1	-	-	2 red deer canine pendants	-
16	16.1	-	2 scrapers	1 "Sword" composed of 15 microlithic insert tools, 3 dog phalanges, bird (heron?) bones	-
19	19.1	2 nephrite axes, 1 chert flake, 2 hare claws, 2 ceramic fragments, bone needles, 1 bone needle case, 9 rounded pebbles, 1 bone point fragment, 1 light nephrite ring, 15 red deer canine pendants, 1 calcite ring.	*Cluster 1:* 1 needle case fragment, 2 bone tools, 2 chert knives, 2 end scrapers, 4 flakes, 1 disc-shaped scraper, 1 nephrite knife fragment, 1 harpoon; 2 lithic knives, *Cluster 3:* 1 flake, 1 scraper, 1 chalcedony awl, 1 arrowhead, 1 bone point fragment, 1 bone point, *Cluster 4:* 5 whole needles, 6 needle fragments, tubular bird bones, 1 fragment of bone awl	*Cluster 2:* 7 fragments of bronze ornament, 1 fragment of bronze object, 2 bear tooth pendants, 1 articulated hare paw. *Cluster 3:* white nephrite disc	-
23	23.1	28 ceramic fragments, 3 chert flakes	2 chert arrowheads, 7 ceramic fragments	-	-
24	24.1	-	-	-	-
29	29.1	Fragments of antler	Individual find: 1 chert scraper; *Cluster 1: 1* chert biface, 1 flake, 1 end scraper, 2 blades	1 white nephrite disc; Cluster: 1 red deer canine pendant with two perforations	-
31	31.1	Ceramic fragments in upper layers	6 ceramic fragments, bone point fragment[3], 2 fragments of tubular bone	1 white nephrite disc	-

Table 5.3 (continued): Summary of grave inclusions at Uliarba

Grave number	Burial number	Objects found in upper levels	Implements associated with burial	Ornaments/Animal Bones associated with burial	Grave inclusions found between individuals in multiple graves
32	32.1	Ceramic fragments in upper layers	Ceramic fragments, 1 chert drill, 1 quartzite flake,	1 white nephrite disc, 1 red deer canine pendant	-
34	34.1	Ceramic fragments in upper layers	1 green nephrite tool fragment (knife?)	-	-
35	35.1	Dog burial, 1 chert arrowhead, 3 ceramic fragments	Cluster 1: green nephrite knive, chert spearpoint, 2 bone fleshers, bone needle\, bone tool fragment, bone point fragment, bone insert tool; Cluster 2: bronze fish hook, 2 bronze rivets, chert borer, chert blade, chert arrowhead; Cluster 3: 9 chert arrowheads; Cluster 4: 24 chert arrowheads, chert borer, nephrite axe, slate abrader, 3 flakes	White nephrite disc, 3 red deer canine pendants	-
36	36.1	1 chert flake, animal vertebrae, animal scapula	1 nephrite knife, bone point fragments	2 fish vertebrae	-
37	37.1	-	1 antler spoon, 1 lithic knife, one point fragment, 1 bone needle case	1 red deer canine pendant	-
38	38.1	-	1 bronze fishhook, 1 bone flesher	2 red deer canine pendants	-
42	42.1	-	1 slate axe	-	-
13	13.1	-	1 chert end scraper, 1 bone spoon, 1 bone needle case, 2 chert flakes	46 red deer canine pendants, 2 nephrite blades, 1 nephrite disc, 1 nephrite ring	1 red deer canine pendant, 1 chert flake, 1 light nephrite ring, several chert flakes, 1 chert blade, 1 light nephrite ring, 1 tubular bone awl
	13.2	-	1 bone point, 1 chert flake	5 red deer canine pendants, 3 rodent incisors (2 of which were perforated), 12 argonite beads, 29 cylindrical paste beads	
7	7.1	Ceramic fragments and 1 lithic arrowhead[5]	-	1 white nephrite disc, 1 red deer molar	-
20	20.1	-	1 chert leaf-shaped biface,	2 perforated red deer canine pendants	-
30	30.1	-	3 fragments of antler point	1 white nephrite disc	-
33	33.1	-	-	1 red deer canine pendant	-
40	40.1	-	*Cluster 1:* 2 chert microscrapers, 5 chert blades, 2 chert flakes, 1 quartzite blade, 1 leaf-shaped knife, 2 microlith insert tools, 2 nephrite axes, 2 quartzite knives, 1 lithic spear point, and 4 chert end scrapers. *Cluster 2:* Fragments of a flat bone spoon reservoir, 1 bone needle, 1 fragment of a bone needle case, 3 bone/antler points	*Cluster 3:* 1 metal tube fragment, 3 metal "rivets", 5 marmot canines	-

NOTES:
* Burial No. 2.1: Items in brackets were found in the middle of a circle made by the other items in the artifact cluster
[1] Goriunova (2005) refer to these as beads; however to remain consistent with KN XIV I classify them discs.
[2] Goriunova et al. (2005: Table 12) list 5 red deer canine pendants as recovered from Grave No. 5; however, the description of the grave (pages 14–15) make no mention of these items. I have excluded them from this analysis.
[3] Goriunova et al. (2005: Table 11) do not list any bone points from Grave No. 31, but the descriptions (pages 17-19) mention fragments of a bone tool and tubular bone fragments. I have included these in my totals.
[4] Groiunova et al. (2005: Table 11) report 15 bone arrowheads for Grave No. 10, but they only report five in the text (page 19). I am assuming that the figure in their Table 11 was a typo
[5] Goriunova et al. (2005: Table 11) report Burial No. 7 as possessing a lithic arrowhead; however, the text (pages 16-17) describes the context of this find as the top layers of the paving.

Table 5.4: Distribution of artifact classes at Uliarba

		Grave Number	19	35	2*	13*	40	3*	9	10	29	32	16	37	6	31	36	38	5	7	20	30	1*	4	8	34	42	33	24	# of Bronze Age graves with object	% of Bronze Age graves with object (out of 27)	# Cases within centre cluster	# Cases outside centre cluster	% Cases within centre cluster	% Cases outside centre cluster	% of graves in centre cluster with object (out of 16)	% of graves outside centre cluster with object (out of 11)
		Age of Individual: (A=Adult, J=Adolescent, C=Child)		A	J/C	A		A/C	A	A			J	A			A	A					C		J		A										
		Sex of Individual: (M=Male, F=Female)		F	M	M/F		M	M	M				F			F										F										
		Location (S=South, C=Centre, NE=Northeast, N=North)	S	NE	S	C	NE	S	C	C	C	C	S	NE	C	C	NE	NE	C	C	C	C	S	C	C	C	C	C	N								
IMPLEMENTS	Lithics	Abrader		■	■				■																					3	11	1	2	33	67	6	18
		Arrowhead	■	■	■			■	■	■																				6	22	2	4	33	67	13	36
		Biface/Knife	■		■		■	■	■		■			■							■									8	30	3	5	38	63	19	45
		Borer/Awl/Drill	■	■	■			■				■																		5	19	1	4	20	80	6	36
		Flake/Blade	■	■	■	■	■		■		■	■			■									■						10	37	6	4	60	40	38	36
		Microlith Inserts					■						■																	2	7	0	2	0	100	0	18
		Nephrite axe/adze	■	■	■		■																							4	15	0	4	0	100	0	36
		Nephrite knife	■	■		■		■	■								■									■				7	26	3	4	43	57	19	36
		Scraper	■		■	■	■				■		■		■				■											8	30	4	4	50	50	25	36
		Slate Axe/Adze				■																					■			2	7	2	0	100	0	13	0
		Spearpoint		■			■		■										■											4	15	2	2	50	50	13	18
	Bone/Antler	Arrowhead								■																				1	4	1	0	100	0	6	0
		Borer/Awl			■	■																								2	7	1	1	50	50	6	9
		Flesher		■				■		■								■												4	15	1	3	25	75	6	27
		Harpoon	■		■			■		■																				4	15	1	3	25	75	6	27
		Insert tool shaft		■																										1	4	0	1	0	100	0	9
		Needle/Needle Case	■	■		■	■	■						■																6	22	1	5	17	83	6	45
		Point	■	■	■	■	■	■	■	■			■	■		■	■					■								13	48	5	8	38	62	31	73
		Rod						■																						1	4	0	1	0	100	0	9
		Spoon				■	■							■																3	11	1	2	33	67	6	18
	Metal	Fishhook		■														■												2	7	0	2	0	100	0	18
		Knife						■																						1	4	0	1	0	100	0	9
		Needle								■																				1	4	1	0	100	0	6	0
		Rivets		■			■																							2	7	0	2	0	100	0	18
		Tube			■		■																							2	7	0	2	0	100	0	18
	Ceramics	Sherds	■									■				■														3	11	2	1	67	33	13	9
ORNAMENTS	Lithics	Cylindrical beads				■																								1	4	1	0	100	0	6	0
		Disc beads				■																								1	4	1	0	100	0	6	0
		Calcite Discs																					■							1	4	0	1	0	100	0	9
		Calcite Rings	■																											1	4	0	1	0	100	0	9
		Nephrite Discs	■	■					■		■	■				■				■		■								8	30	6	2	75	25	38	18
		Nephrite Rings	■																											1	4	0	1	0	100	0	9
		Pebbles	■		■																									2	7	0	2	0	100	0	18
	Organic	Red deer canine pendant	■	■		■				■	■	■		■	■			■			■		■					■		12	44	7	5	58	42	44	45
		Rodent incisors pendant				■																			■					2	7	2	0	100	0	13	0
	Metal	Medallion	■																											1	4	0	1	0	100	0	9
ANIMAL REMAINS		Mandibles			■																									1	4	0	1	0	100	0	9
		Unmodified bird bones	■										■																	2	7	0	2	0	100	0	18
		Unmodified animal teeth	■				■													■										3	11	1	2	33	67	6	18
		Dog remains			■								■																	2	7	0	2	0	100	0	18
		Hare paw	■																											1	4	0	1	0	100	0	9
		Fish remains															■													1	4	0	1	0	100	0	9
		Total Implement Classes	11	13	11	8	11	10	7	6	3	3	3	4	2	2	2	2	2	0	1	1	0	1	0	1	1	0	0								
		Total Ornament Classes	6	2	1	4	0	0	1	1	2	2	0	1	1	1	0	1	0	1	1	1	2	0	1	0	0	1	0								
		Total Animal Remains Classes	3	0	2	0	1	0	0	0	0	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0								
		Total Overall Classes	20	15	14	12	12	10	8	7	5	5	5	5	3	3	3	3	2	2	2	2	2	1	1	1	1	1	0								

*Multiple graves

Table 5.5: Summary of mortuary variability at Sarminskii Mys

Grave Number	Burial Number	Mortuary Protocol (Goriunova 2002)	Age	Sex	Body Position	Grave Type	Burial Orientation	Use of Fire	Use of Ochre	Objects found in upper levels	Implements associated with Burial	Ornaments/Animal Bones associated with Burial
2	2.1	Glazkovo	-	-	Extended supine	Single	NW-SE	Charred sediment and charcoal in pit filling	-	-	-	-
4	4.1	Glazkovo	-	-	Extended supine	Single	NW-SE	Charred sediment and charcoal in pit filling	-	-	4 chert blades, 3 end scrapers, 1 hammer stone	5 nephrite discs
9	9.1	Glazkovo	-	-	Extended supine	Single	NW-SE	-	-	-	-	-
10	10.1	Glazkovo	-	-	Extended supine	Single	NW-SE	-	-	1 nephrite axe fragment, 1 quartzite flake,1 flake, 1 tube-like bone	2 bone points, 1 green nephrite knife, 2 bone harpoons, 1bone arrowhead	4 red deer canine pendants (2 with double perforation)
12	12.1	Glazkovo	"older adult"	Female	Extended supine	Single	NW-SE	-	-	-	1 one spoon, bird bones, 1 pike jaw, 1 bronze knife, 1 chalcedony scraper, 1 bone fish hook, 1 bone needle, 2 chert arrowheads, 2 bone fish lures, 1 chert biface (knife?)	1 lunar nephrite pendant
13	13.1	Glazkovo	-	-	Extended supine	Single	NW-SE	-	-	-	2 bone points, 1 bone arrowhead, 2 green nehprite knives, 1 chert flake	-
21	21.1	Glazkovo	-	-	Extended supine	Single	W-E	Localized - skull	-	-	-	-
25	25.1	Glazkovo	-	-	Extended supine	Single	NW-SE	-	-	-	1 nephrite axe/adze	-
26	-	Glazkovo	Infant?		No skeletal remains recovered			-	-	-	-	-
27	-	Glazkovo	Infant?		No skeletal remains recovered			-	-	-	-	-
28	-	Glazkovo	Infant?		No skeletal remains recovered			-	-	1 chert blade	-	-
32	32.1	Glazkovo	-	-	Extended supine	Single	NW-SE	Localized - vertebrae	-	-	-	-
33	33.1	Glazkovo	-	-	Extended supine	Single	NW-SE	-	-	-		1 articulated hare paw
3	-	Ritual/Child?			No skeletal remains recovered			-	-	13 ceramic fragments	-	-
5	-	Ritual/Child?			No skeletal remains recovered			-	-	-	-	-
7	-	Ritual/Child?			No skeletal remains recovered			-	-	ceramic fragments, animal bone fragments	-	-
14	-	Ritual/Child?			No skeletal remains recovered			-	-	-	-	-
15	-	Ritual/Child?			No skeletal remains recovered			-	-	-	-	-
16	-	Ritual/Child?			No skeletal remains recovered			-	-	charred unidentified bone fragments	-	-
18	-	Ritual/Child?			No skeletal remains recovered			-	-	-	-	-

Table 5.6: Summary of mortuary variability at Shamanskii Mys

Grave Number	Burial Number	Mortuary Protocol (Konopatskii	Age (years)	Sex	Body Position	Grave Type	Burial Orientation	Use of Fire	Use of Ochre
1 (1972)	1.1 (1975)	Glazkovo	20-40	Female	Extended Supine	Single	SW-NE	-	-
2 (1972)	1.1 (1972)	Glazkovo	40-50	Male	Extended Supine	Single	NW-SE	Fire pit in upper layer of pit	-
1(1973)	1.1 (1973)	Glazkovo	20-40	Male	Extended Supine	Single	W-E	Charcoal layers in upper layers?	-
2 (1973)	2.1 (1973)	Glazkovo	20-40	Female	Extended Supine	Single	W-E	-	-
3 (1973)	3.1 (1973)	Glazkovo	20+	Female	Extended Supine	Double	W-E	-	-
	3.2 (1973)		4-6	-	-		-	-	-
4 (1973)	-	Glazkovo	Only a dog mandible was recovered from this grave plus assorted artifacts					-	-
1 (1975)	1.1 (1975)	Glazkovo	30-35	Male	Extended Supine	Single	W-E	-	-

Table 5.7: Summary of grave inclusions at Shamanskii Mys

Grave Number	Burial Number	Objects found in upper levels	Implements associated with Burial	Ornaments/Animal Bones associated with Burial
1 (1972)	1.1 (1975)	Collection of deer antlers, 2 nephrite discs, 1 miniature nephrite axe	*Individual finds*: 1 chert borer, 1 chert scraper; *Cluster 1:* 1nephrite axe, 1 miniature nephrite adze, 2 slate blades, 1 chert blade (knife?), 1 chert flake, tubular bird bones (needlecase), 1 chert scraper, 1 unidentified flat bone; *Cluster 2:* 1 bone awl, 2 copper needles, 1 chert scraper, 2 chert knives, bone needlecases	*Cluster 1:* 1 lunar shaped nephrite pendant, 2 drilled bear teeth, 1 rodent jaw, 1 nephrite disc; *Cluster 2:* two red deer canine pendants
2 (1972)	1.1 (1972)	-	2 flakes, 1 bone knife, 2 bone harpoon head, 1 scraper, 1 antler point, 1 nephrite knife, 1 elk scapula, 3 bone borers, 1 nephrite knife, 1 bone tool fragment, two antler "clutches", "pravilka" from elk antler, 47 bone arrowheads, chert and bone arrowheads, two serrated bone shovels	1 seal tooth, 3 elk canines
1(1973)	1.1 (1973)	A pit located just to the west of the grave included a large collection of animal bones; within the upper levels of the grave pit were found 1 animal mandible, ceramic fragments, unidentified bone fragments, and a large quantity of birch bark	1 slate arrowhead, 1 bone arrowhead, 1 antler "dagger", 2 awl fragments, 1 abrader, 1 bone knife	1 white nephrite bracelet, 2 white nephrite discs, collection of red deer canine pendants
2 (1973)	2.1 (1973)	-	1 bone point, 1 green nephrite axe, 1 bone spoon, 1 animal scapula (shovel?), 1 bone point, 1 bone needle and needle case	-
3 (1973)	3.1 (1973)	-	2 large green flakes plus 1 arrowhead embedded in scapula, 1 chert point	-
	3.2 (1973)	-	2 chert arrowheads, 1 chert adze	1 bear canine, 1 white nephrite ring
4 (1973)	-	-	1 nephrite axe/adze, ceramic fragments	1 red deer canine pedant, 1 nephrite pendant, 2 roe deer canine pendants, animal claw pendants
1 (1975)	1.1 (1975)	-	1 chert arrowhead, 1 bone harpoon, bone points, 1 copper knife	1 small nephrite disk, 1 nephrite ring,

Table 5.8: Summary of mortuary variability at Shide I

Grave Number	Burial Number	Mortuary Protocol (Gorbunova and Pshenitsyna 1996)	Age (years)	Sex	Body Position	Grave Type	Burial Orientation	Use of Fire	Use of Ochre	Objects found in upper levels	Implements associated with Burial	Ornaments/Animal Bones associated with Burial
1	1.1				No skeletal remains				-	-	-	-
2	2.1	Sitting	adult(?)	Male(?)	Sitting - skull, tibiae, scapula missing	Single	-	-	Skeletal remains (especially leg bones) covered in ochre	-	-	-
3	3.1	Sitting	3-6	-	Sitting	Single	-	-	-	-	Chert blade	7 red deer caninne pendants
4	4.1	Sitting	child	-	Sitting - individual bones only	Single	-	-	-	-	-	-
5	5.1	Sitting	~4	-	Sitting - only two bones preserved	Single	-	-	-	-	-	-
6	6.1	Sitting	4-6	-	Sitting - skull fragments in pit, plus scattered bone fragments outside pit	Single	-	-	-	-	-	-
7	7.1	Sitting	16-18	-	Sitting - disarticulated, missing skull	Single	-	-	Deep red colour on the scapula	-	Lithic blade	-
8	8.1				No skeletal remains			-	-	Chert bifacial insert tool, chert arrowhead	-	-
9	9.1	Sitting	~6	-	Sitting - disarticulated and intermingled remains	Double	-	-	Bones and surrounding sediment intensively coloured by ochre	6 chert arrowheads	6 red deer canine pendants	6 red deer canine pendants
	9.2	Sitting	adult(?)	-			-	-				
10	10.1	Sitting	-	-	Sitting - a few phalanges only	Single	-	-	-	-	-	-
11	11.1	Sitting	adult(?)	Female(?)	Sitting - ribs and arm bones only	Single	-	-	-	-	Bone needle case enclosing two bone needles	-
12	12.1	Sitting	-	-	Sitting - arm bones and a skull only	Single	-	-	-	-	-	-
13	13.1				No skeletal remains			-	-	-	-	-
14	14.1				No skeletal remains			-	-	-	-	-

Table 5.9: Summary of mortuary variability at Ulan-Khada II

Grave Number	Burial Number	Age	Sex	Body Position	Grave Type	Burial Orientation	Use of Fire	Use of Ochre	Objects found in upper levels	Implements associated with Burial	Ornaments/Animal Bones associated with Burial
1	1.1	Infant	-	Extended Supine	Single	NW	-	-	-	-	-
2	1.2	60-70	-	Extended Supine	Single	NNE-SSW	-	-	-	23 chert arrowheads, 1 chert knife, 1 bone tool, 1 chalcedony borer, 1 bone needle in a needle case, 1 bronze knife with a wooden handle, 1 long curved bone plate, 1 antler tool with bifurrcated tip, 2 fragments of bone tool	7 red deer canine pendants
3	1.3	Adult	Male	Extended with one leg flexed up and resting against the pit wall	Single	NW	-	-	Ceramic fragments	Bone harpoon, bone snow knife (?), bone spatula, bone stem, 16 chert arrowheads, nephrite knife	1 bear tooth, 1 wolf mandible, 63 round pebbles, 47 red deer tooth pendants
4	1.4	Older Adult	Female	Only a cranium and mandible recovered	Single(?)	-	-	-	-	1 nephrite axe, 2 ceramic fragments	1 white nephrite disc, 1 deer tooth pendant
5	1.5	Young adult	Female	Tightly flexed on left side	Single	W	-	-	1 large chert flake	-	-
6	1.6			No skeletal remains			-	-	-	1 chert blade, 3 chert flakes, 3 ceramic fragments, animal tubular bone fragments, lithic spalls with evidence of working	-

Table 5.10: Summary of mortuary variability at Ulan-Khada IV

Grave Number	Burial Number	Chronology	Age (years)	Sex	Body Position	Grave Type	Burial Orientation	Use of Fire	Use of Ochre
1	1.1	Bronze	40-50	Male	Extended supine	Single	WNW	-	-
2	2.1	Bronze	Adult	-	Several disarticulated bone fragments were recovered	Single	-	-	-
3	3.1	Bronze	30-40	Male	Flexed sitting position facing each other	Double/Triple?	?	-	-
	3.2	Bronze	Young adult?	Male?			?	-	-
	3.3(?)	Bronze	Adult	-	Single clavicle recovered - related to one of the other burials?		-	-	-
4	4.1	Bronze	30-40	Female	Scattered and fragmented bones	Multiple with three layers	-	-	-
	4.2	Bronze	30-40	Male	Disarticulated skeletal elements dsispersed throughout the middle burial layer		-	-	-
	4.3	Bronze	20-30	Female			-	-	-
	4.4	Bronze	Adult?	-			-	-	-
	4.5	Bronze	18-20	Female	Extended supine		NNW	-	-
	4.6	Bronze	30-40	Male	Secondary bundle(?)		-	-	-
5	5.1	Bronze	20-30	Female	Sitting - but only a cranium mandible and long bones recovered	Multiple with two layers (2 burials on each layer)	-	-	-
	5.2	Bronze	-	-	Supine with legs bent, but only cranium and leg bones recovered		NW	-	-
	5.3	Early Neolithic/Bronze Age?	40-50	Male	Extended supine with slightly flexed legs		SE	-	-
	5.4	Early Neolithic/Bronze Age?	20-30	Female	Extended supine		SE	-	-
6	Circular structure on the surface, but no remains found. Infant burial?								
7	Circular structure on the surface, but no remains found. Infant burial?								
8	8.1	Bronze	Infant	-	Extended supine	Single	SW	-	-
9	Circular structure on the surface, but no remains found. Infant burial?								
10	Circular structure on the surface, but no remains found. Infant burial?								
11	11.1	Bronze	Adult	-	Flexed on side	Double - single layer	SW	-	-
	11.2	Bronze	Infant	-	? - Infant remains placed near head of the adult individual		-	-	-
12	12.1	EarlyNeolihtic	-	-	-	Single	-	-	Thick layer of ochre on skeletal remains
13	13.2	EarlyNeolihtic	No skeletal remains			Single	-	Skeletal elements and sediments covered in charcoal	Ochre covered the bottom of the grave pit apparently in the shape of a body
14	14.1	Bronze	Older Adult	Male	Extended supine	Double - side by side	NW	-	-
	14.2	Bronze	~30 years	Female	Extended supine		NW	-	-
15	15.1	Early Neolithic	Adult	Male	Supine with flexed legs	Single	-	-	Entire skeleton covered in ochre
16-21	Circular structure on the surface, but no remains found. Infant burial?								

Table 5.10 (continued): Summary of mortuary variability at Ulan-Khada IV

Grave Number	Burial Number	Objects found in upper levels	Implements associated with Burial	Ornaments/Animal Bones associated with Burial
1	1.1	Worked deer antler	-	1 boar tusk ornament
2	2.1	-	-	-
3	3.1	-	-	-
	3.2	-	-	-
	3.3(?)	-	-	-
4	4.1	-	-	1 boar tusk blade
	4.2	-	-	-
	4.3	-	-	-
	4.4	-	-	-
	4.5	-	1 copper blade	2 boar tusk blades
	4.6	-	Bone harpoon, bone awl	1 white nephrite pendant in the shape of a small axe, 1 moose head figurine, 1 bear tooth, 1 boar tusk blade
5	5.1	-	-	-
	5.2	-	-	-
	5.3	-	-	1 boar tusk blade
	5.4	-	1 chert arrowhead, 3 lithic pryismatic blades, 2 lithic blades	1 boar tusk blade, 3 red deer canine pendants, 1 piece of ochre,
6		Circular structure on the surface, but no remains found. Infant burial?		
7		Circular structure on the surface, but no remains found. Infant burial?		
8	8.1	-	-	-
9		Circular structure on the surface, but no remains found. Infant burial?		
10		Circular structure on the surface, but no remains found. Infant burial?		
11	11.1	-	1 antler tool with wooden handle	1 white nephrite ring
	11.2	-	-	1 red deer canine pendant
12	12.1	-	2 lithic blades, 4 flakes	-
13	13.2	-	1 flake, 1 lithic blade	-
14	14.1	-	2 ceramic fragments, 1 chert flakes	-
	14.2	-	Chalcedony scraper, 1 ceramic fragment, 1 fishhook stem(?)	-
15	15.1	-	1 chert flake fragment	-
16-21		Circular structure on the surface, but no remains found. Infant burial?		

Figure 5.11: Summary of Bronze Age mortuary variability in the Little Sea microregion

		KN XIV	Uliarba	Sarminskii Mys	Kurma XI	Khadarta IV	Shaminskii Mys	Shide I	Shide VIII	Shrakshura II	Khalurinskii Mys I	Sokhtyer VIII	Sokhtyer IX	Guroo-Ushoon IV	Ontokhoi	Sagan-Nuge I	Ulan-Khada II	Ulan-Khada IV	Ulan-Khada V	Ulan-Khada VI	Kharansin I
Cemetery Level of Analysis																					
Cemetery location	cape	-	-	•	-	-	•	-	-	•	•	-	-	-	•	-	•	•	•	•	-
	cove	•	•	•	-	•	-	-	-	-	-	-	-	?	•	•	•	•	•	•	-
	slope orientation	SW	SE	-	SE	SE	-	SE	SW	S, SW	S, SW	NW	E	?	-	W	W	W	W	W	S
	slope facing lake	•	•	•	•	•	-	•	-	•	•	-	-	?	-	-	•	•	•	•	-
	height above Baikal (m)	15-30	10-35	-	7-32	15-30	?	?	?	21-28	32-50	?	?	?	?	?	?	?	?	?	?
Cemetery size	number of features visible on surface	79	40	33	26	14	7	14	7	18	8-10	1	1	1	?	?	?	?	?	?	8
	number of bronze age graves	78	27	13	24	14	7	14	7	17?	7?	1	1	1	?	2?	6?	8-18?	2	1	8
	number of excavated bronze age graves	78	27	13	23	5	7	14	-	1	1	-	1	-	-	2	6?	8-18?	2	1	8
	number of excavated bronze age burials	88	33	13	21	4	7	11	-	1	1	-	1	-	-	-	5?	20?	3	1	8
Spatial Organization	rows of graves	•	•	-	-	?	•	-	?	?	-	-	-	-	-	-	-	-	-	-	-
	rows of graves perpendicular to fall line	•	-	-	-	-	n/a	-	?	?	-	-	-	-	-	-	-	?	-	-	-
	rows of graves parallel to fall line	-	•	-	-	-	n/a	-	?	?	-	-	-	-	-	-	-	?	-	-	-
	clusters of graves	•	•	•	?	•	•	•	?	?	-	-	-	-	-	-	•	•	-	-	-
	spatial data unavailable	-	-	-	-	-	-	-	•	-	•	-	-	-	•	•	-	-	•	-	•
Feature Level of Analysis																					
Grave Type	number of single graves (% of excavated graves)	68 (87%)	24 (89%)	10 (77%)	20 (87%)	4 (80%)	6 (86%)	9 (64%)	-	1 (100%)	1 (100%)	-	1 (100%)	-	-	2 (100%)	6 (100%)	3 (38%)	1 (50%)	1 (100%)	-
	number of multiple side by side graves (% of excavated graves)	8 (10%)	3 (11%)	-	1 (4%)	-	1 (14%)	1 (7%)	-	-	-	-	-	-	-	-	-	3 (38%)	1 (50%)	-	-
	number of multiple stacked graves (% of excavated graves)	1 (1%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2 (25%)	-	-	-
	number of unknown/disturbed/unexcavated (% of all graves)	1 (1%)	-	3 (23%)	-	-	-	4 (29%)	-	-	6 (86%)	1 (100%)	-	1 (100%)	7 (7%)	-	-	-	-	-	-
Burial Level of Analysis																					
Demography	number of males (% of sexed burials)	27 (84%)	6 (55%)	-	9 (69%)	-	3 (50%)	1 (50%)	-	-	-	-	-	-	-	-	-	7 (54%)	-	-	-
	number of females (% of sexed burials)	5 (16%)	5 (45%)	1 (100%)	4 (31%)	2 (100%)	3 (50%)	1 (50%)	-	-	-	-	-	-	-	-	1 (100%)	6 (46%)	-	-	-
	number of unknown sex (% of total burials)	56 (64%)	22 (67%)	12 (92%)	8 (38%)	2 (50%)	-	9 (82%)	-	1 (100%)	1 (100%)	-	1 (100%)	-	-	2 (100%)	4 (80%)	7 (35%)	3 (100%)	1 (100%)	7 (100%)
	number of adults (% of aged burials)	54 (67%)	10 (50%)	1 (25%)	19 (90%)	4 (100%)	6 (86%)	3 (33%)	-	-	-	-	-	-	-	-	4 (80%)	17 (89%)	-	-	-
	number of adolescents (% of aged buirals)	11 (14%)	5 (25%)	-	2 (10%)	-	-	1 (11%)	-	-	-	-	-	-	-	-	-	-	-	-	-
	number of children (% of aged burials)	16 (20%)	5 (25%)	3 (75%)	-	-	1 (14%)	5 (56%)	-	-	-	-	-	-	-	-	1 (20%)	2 (11%)	-	-	-
	number of unknown age (% of excavated burials)	7 (8%)	13 (39%)	9 (69%)	8 (38%)	-	-	2 (18%)	-	1 (100%)	1 (100%)	-	1 (100%)	-	-	2 (100%)	-	1 (5%)	3 (100%)	1 (100%)	7 (100%)

Figure 5.11 (continued): Summary of Bronze Age mortuary variability in the Little Sea microregion

		KN XIV	Uliarba	Sarminskii Mys	Kurma XI	Khadarta IV	Shaminskii Mys	Shide I	Shide VIII	Shrakshura II	Khalurinskii Mys I	Sokhtyer VIII	Sokhtyer IX	Guroo-Ushoon IV	Ontokhoi	Sagan-Nuge I	Ulan-Khada II	Ulan-Khada IV	Ulan-Khada V	Ulan-Khada VI	Kharansin I
Body Position	extended supine (% of burials with defined position)	63 (90%)	16 (57%)	10 (100%)	14 (82%)	3 (100%)	6 (100%)	-	-	-	-	-	-	-	-	1 (50%)	4 (80%)	7 (58%)	1 (50%)	-	2 (100%)
	flexed legs supine (% of burials with defined position)	7 (10%)	12 (43%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 (8%)	1 (50%)	-	-
	flexed legs on side (% of burials with defined position)	-	-	-	-	-	-	-	-	1 (100%)	-	-	-	-	-	1 (50%)	1 (20%)	1 (8%)	-	-	-
	sitting (% of burials with defined position)	-	5 (18%)	-	3 (18%)	-	-	10 (100%)	-	-	-	-	1 (100%)	-	-	-	-	3 (25%)	-	-	-
	impossible to determine/unreported (% of all burials)	18 (20%)	-	3 (23%)	4 (19%)	1 (25%)	1 (14%)	-	-	-	1 (100%)	-	-	-	-	-	-	8 (40%)	1 (33%)	1 (100%)	5 (71%)
Burial Orientation	N-S (% of burials with orientation)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	W-E (% of burials with orientation)	47 (67%)	-	1 (10%)	-	1 (33%)	5 (71%)	-	-	-	-	-	-	-	-	-	1 (20%)	1 (11%)	-	-	-
	NW-SE (% of burials with orientation)	3 (4%)	-	9 (90%)	1 (6%)	-	-	-	-	-	-	-	-	-	-	1 (50%)	4 (80%)	4 (44%)	2 (100%)	-	2 (100%)
	SW-NE (% of burials with orientation)	20 (29%)	26 (93%)	-	16 (94%)	2 (67%)	1 (14%)	-	-	-	-	-	-	-	-	-	-	2 (22%)	-	-	-
	E-W (% of burials with orientation)	-	1 (4%)	-	-	-	-	-	-	1 (100%)	-	-	-	-	-	1 (50%)	-	-	-	-	-
	NE-SW (% of burials with orientation)	-	-	-	-	-	1 (14%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SE-NW (% of burials with orientation)	-	1 (4%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2 (22%)	-	-	-
	not applicable (e.g., sitting, bundles) (% of excavated burials)		5 (15%)	-	-	-	-	11 (100%)	-	-	-	-	1 (100%)	-	-	-	-	3 (15%)	-	-	-
	unknown burial orientation (% of excavated burials)	18 (20%)	-	3 (23%)	4 (19%)	1 (25%)	-	-	-	-	1 (100%)	-	-	-	-	-	-	8 (40%)	1 (33%)	1 (100%)	5 (71%)
Burial Treatment	extensive charring of skeletal remains (% of excavated burials)	4 (5%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	localized charring on skeletal remains (% of excavated burials)	13 (15%)	-	2 (15%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 (14%)
	charcoal/burnt sediment in pit (% of excavated graves)	-	-	2 (15%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5 (63%)
	extensive coverage of skeltal remains with ochre (% of excavated burials)	1 (1%)	3 (9%)	-	-	-	-	-	-	-	-	-	-	-	-	1? (50%)	-	-	-	-	-
	localized spots of ochre on skeletal remains (% of excavated burials)	3 (3%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ochre spots in sediment only (% of excavated graves)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Figure 5.12: Number (%) of Bronze Age graves containing artifact types

		Artifact Class	KN XIV (n=78)	Uliarba (n=27)	Sarminskii Mys (n=13)	Kurma XI	Khadarta IV (n=5)	Shaminskii Mys (n=7)	Shide I (n=14)	Shide VIII	Shrakshura II (n=1)	Khalurinskii Mys I (n=1)
IMPLEMENTS	Lithics	Abrader	5 (6%)	3 (11%)	-	Unpublished	-	1 (14%)	-	Unexcavated	-	-
		Arrowheads	24 (31%)	6 (22%)	1 (8%)		1 (20%)	6 (86%)	2? (14%)		-	-
		Biface/Knife	6 (8%)	8 (30%)	1 (8%)		1 (20%)	1 (14%)	1? (7%)		-	-
		Borer/Awl/Drill	3 (4%)	5 (19%)	-		-	2 (29%)	-		-	-
		Burin	2 (3%)	-			-	-	-		-	-
		Chert Axe/Adze	-	-	-		-	1 (14%)	-		-	-
		Flake/Blade	21 (27%)	10 (37%)	3 (23%)		2 (40%)	3 (43%)	2 (14%)		-	-
		Hammerstone	-	-	1 (8%)		-	-	-		-	-
		Microlith Inserts	2 (3%)	2 (7%)	-		-	-	-		-	-
		Nephrite axe/adze	8 (10%)	4 (15%)	2 (15%)		2 (40%)	3 (43%)	-		-	-
		Nephrite knife	6 (8%)	7 (26%)	2 (15%)		1 (20%)	1 (14%)	-		-	1 (100%)
		Raw material	-	-	-		-	-	-		-	-
		Scraper	10 (13%)	8 (30%)	2 (15%)		1 (20%)	2 (29%)	-		-	-
		Slate Axe/Adze	-	2 (7%)	-		-	-	-		-	-
		Spearpoint	-	4 (15%)	-		-	-	-		-	-
		Spokeshave	-	-	-		1 (20%)	-	-		-	-
	Organic	Arrowheads	2 (3%)	1 (4%)	2 (15%)		-	1 (14%)	-		-	-
		Borer/Awl	-	2 (7%)	-		1 (20%)	2 (29%)	-		-	-
		Fish lure	-	-	1 (8%)		-	-	-		-	-
		Fishhook	-	-	1 (8%)		-	-	-		-	-
		Flesher	-	4 (15%)	-		1 (20%)	-	-		-	-
		Harpoon	3 (4%)	4 (15%)	1 (8%)		-	2 (29%)	-		-	-
		Insert tool shaft	-	1 (4%)	-		-	-	-		-	-
		Knife	-	-	-		-	2 (29%)	-		-	-
		Needle/Needle Case	1 (1%)	6 (22%)	1 (8%)		-	2 (29%)	1 (7%)		-	-
		Point	10 (13%)	13 (48%)	2 (15%)		1 (20%)	5 (71%)	-		-	-
		Rod	-	1 (4%)	-		-	-	-		-	-
		Spoon/Shovel	3 (4%)	3 (11%)	1 (8%)		1 (20%)	2 (29%)	-		-	-
	Metal	Fishhook	2 (3%)	2 (7%)	-		-	-	-		-	-
		Knife	2 (3%)	1 (4%)	1 (8%)		-	1 (14%)	-		-	-
		Needle	2 (3%)	1 (4%)	-		-	1 (14%)	-		-	-
		Rivets	-	2 (7%)	-		-	-	-		-	-
		Tube	1 (1%)	2 (7%)	-		-	-	-		-	-
	Ceramics	Sherds	-	3 (11%)	-		-	-	-		-	-

Figure 5.12 (continued): Number (%) of Bronze Age graves containing artifact types

		Artifact Class	KN XIV (n=78)	Uliarba (n=27)	Sarminskii Mys (n=13)	Kurma XI	Khadarta IV (n=5)	Shaminskii Mys (n=7)	Shide I (n=14)	Shide VIII	Shrakshura II (n=1)	Khalurinskii Mys I (n=1)
ORNAMENTS	Lithics	Calcite Discs	9 (12%)	1 (4%)	-	Unpublished	1 (20%)	-	-	Unexcavated	-	-
		Calcite Rings	1 (1%)	1 (4%)	-		-	-	-		-	-
		Cylindrical beads	39 (50%)	1 (4%)	-		-	-	-		-	-
		Disc beads	-	1 (4%)	-		-	-	-		-	-
		Nephrite axe pendant	-	-	-		-	-	-		-	-
		Nephrite Discs	10 (13%)	8 (30%)	1 (8%)		1 (20%)	3 (43%)	-		-	-
		Nephrite lunar pendant	-	-	1 (8%)		-	1 (14%)	-		-	-
		Nephrite Rings	2 (3%)	1 (4%)	-		-	3 (43%)	-		-	-
		Pebbles	1 (1%)	2 (7%)	-		-	-	-		-	-
		Animal claw pendants	-	-	-		-	1 (14%)	-		-	-
		Bear tooth pendant	-	-	-		-	1 (14%)	-		-	-
		Boar tusk pendant/blade	-	-	-		-	-	-		-	-
		Moose head figurine	-	-	-		-	-	-		-	-
	Organic	Red deer /Roe Deer canine pendant	17 (22%)	12 (44%)	1 (8%)		1 (20%)	3 (43%)	2 (14%)		-	-
		Red deer hyoid pendant	1 (1%)	-	-		-	-	-		-	-
		Rodent incisors pendant	-	2 (7%)	-		-	-	-		-	-
		Roe deer phalange pendants	1 (1%)	-	-		-	-	-		-	-
	Metal	Halfring	-	1 (4%)	-		-	-	-		1 (100%)	-
		Medallion	-	-	-		-	-	-		-	-
		Rings	3 (4%)	-	-		-	-	-		-	-
Animal Remains		Bird talons	2 (3%)	-	-		-	-	-		-	-
		Carnivore/Rodent Mandibles	4 (5%)	1 (4%)	-		-	1 (14%)	-		-	-
		Dog remains	-	2 (7%)	-		-	-	-		-	-
		Fish remains	1 (1%)	1 (4%)	1 (8%)		-	-	-		-	-
		Hare paw	2 (3%)	1 (4%)	1 (8%)		-	-	-		-	-
		Scapula	2 (3%)	-	-		1 (20%)	2 (29%)	-		-	-
		Unmodified animal teeth	4 (5%)	3 (11%)	-		-	2 (29%)	-		-	-
		Unmodified animal vertebrae	1 (1%)	-	-		-	-	-		-	-
		Unmodified bird bones	-	2 (7%)	1 (8%)		-	-	-		-	-
		Total Implement Classes	19	26	15		11	18	2		0	1
		Total Ornament Classes	10	10	3		3	6	1		1	0
		Total Animal Remains Classes	7	6	3		1	3	0		0	0
		Total Overall Classes	36	42	21		15	27	3		1	1

* See text for description of number of graves

Figure 5.12: Number (%) of B Figure 5.12 (continued): Number (%) of Bronze Age graves containing artifact types

	Artifact Class		Sokhter VIII	Sokhter IX	Guroo-Ushoon IV	Ontokhoi	Sagan-Nuge I (n=2)	Ulan-Khada II (n=6)	Ulan-Khada IV (n=8)*	Ulan-Khada V	Ulan-Khada VI	Kharansin I (n=8)
IMPLEMENTS	Lithics	Abrader	Unexcavated	1 grave excavated - no grave inclusions recovered	Unexcavated	Unexcavated	-	-	-	2 grave excavated - no grave inclusions associated with burials, but 1 lithic blade found in upper levels	1 grave excavated - no grave inclusions associated with burial, but 1 cylindrical bead found in top layer	-
		Arrowheads					-	2 (33%)	1 (13%)			1 (13%)
		Biface/Knife					-	1 (17%)	-			1 (13%)
		Borer/Awl/Drill					-	1 (17%)	-			-
		Burin					-	-	-			-
		Chert Axe/Adze					-	-	-			-
		Flake/Blade					-	1 (17%)	2 (25%)			-
		Hammerstone					-	-	-			-
		Microlith Inserts					-	-	-			-
		Nephrite axe/adze					-	1 (17%)	-			1 (13%)
		Nephrite knife					-	1 (17%)	-			1 (13%)
		Raw material						1 (17%)	1 (13%)			-
		Scraper					-	-	1 (13%)			-
		Slate Axe/Adze					-	-	-			-
		Spearpoint					-	-	-			-
		Spokeshave					-	-	-			-
	Organic	Arrowheads					-	-	-			1 (13%)
		Borer/Awl					-	-	1 (13%)			-
		Fish lure					-	-	-			-
		Fishhook					-	-	1 (13%)			-
		Flesher					-	-	-			-
		Harpoon					-	1 (17%)	1 (13%)			-
		Insert tool shaft					-	-	-			-
		Knife					-	1 (17%)	-			-
		Needle/Needle Case					-	1 (17%)	-			-
		Point					-	1 (17%)	1 (13%)			-
		Rod					-	-	-			-
		Spoon/Shovel					-	1 (17%)	-			-
	Metal	Fishhook					-	-	-			-
		Knife					-	1 (17%)	1 (13%)			-
		Needle					-	-	-			-
		Rivets					-	-	-			-
		Tube					-	-	-			-
	Ceramics	Sherds					-	-	-			-

Figure 5.12 (continued): Numl Figure 5.12 (continued): Number (%) of Bronze Age graves containing artifact types

		Artifact Class	Sokhter VIII	Sokhter IX	Guroo-Ushoon IV	Ontokhoi	Sagan-Nuge I (n=2)	Ulan-Khada II (n=6)	Ulan-Khada IV (n=8)*	Ulan-Khada V	Ulan-Khada VI	Kharansin I (n=8)
ORNAMENTS	Lithics	Calcite Discs	Unexcavated	1 grave excavated - no grave inclusions recovered	Unexcavated	Unexcavated	-	-	-	2 grave excavated - no grave inclusions associated with burials, but 1 lithic blade found in upper levels	1 grave excavated - no grave inclusions associated with burial, but 1 cylindrical bead found in top layer	-
		Calcite Rings					-	-	-			-
		Cylindrical beads					-	-	-			-
		Disc beads					-	-	-			-
		Nephrite axe pendant					-	-	1 (13%)			-
		Nephrite Discs					-	1 (17%)	-			1 (13%)
		Nephrite lunar pendant					-	-	-			-
		Nephrite Rings					-	-	1 (13%)			-
		Pebbles					-	1 (17%)	-			-
		Animal claw pendants					-	-	-			-
		Bear tooth pendant					-	-	-			-
		Boar tusk pendant/blade					-	-	6 (75%)			-
		Moose head figurine					-	-	1 (13%)			-
	Organic	Red deer /Roe Deer canine pendant					-	3 (50%)	2 (25%)			-
		Red deer hyoid pendant					-	-	-			-
		Rodent incisors pendant					1 (50%)	-	-			-
		Roe deer phalange pendants					-	-	-			-
	Metal	Halfring					-	-	-			-
		Medallion					-	-	-			-
		Rings					-	-	-			-
Animal Remains		Bird talons					-	-	-			-
		Carnivore/Rodent Mandibles					-	1 (17%)	-			-
		Dog remains					-	-	-			-
		Fish remains					-	-	-			-
		Hare paw					-	-	-			-
		Scapula					-	-	-			-
		Unmodified animal teeth					-	1 (17%)	1 (13%)			-
		Unmodified animal vertebrae					-	-	-			-
		Unmodified bird bones					-	1 (17%)	-			-
		Total Implement Classes					0	13	9			5
		Total Ornament Classes					1	3	5			1
		Total Animal Remains Classes					0	3	1			0
		Total Overall Classes					1	19	15			6

* See text for description of number of graves

Chapter 6
Synthesis of Little Sea Bronze Age Mortuary Variability

> Interpretations of status, gender, and ranking from funerary deposits are to a large extent dependent on archaeologists' abilities to interpret initially the relationship that the living construct with the dead. [Parker Pearson 1993:203]

The survey presented in the previous chapter demonstrated that Bronze Age mortuary sites in the Little Sea microregion exhibited considerable variation along such important dimensions as size, internal organization, demographic structure, and quantity and diversity of grave inclusions. At the conclusion of that chapter I briefly explored various functional explanations for this variation and proposed that certain sites such as Khuzhir-Nuge XIV (KN XIV) and Uliarba may have comprised community burial grounds, while other sites such as Kurma XI and Shamanskii Mys were more specialized, exclusive cemeteries at which only certain, perhaps higher status, individuals were interred. This approach proved to be only partly successful as it was difficult to reconcile why some high-status individuals were interred at specialized cemeteries while other seemingly equivalent individuals were incorporated within community cemeteries. In addition, it was also difficult to infer functions for those sites consisting of only one or two graves other than to suggest that they might represent cemeteries in the early stages of development. The goal of this chapter is to propose an alternative synthesis that relies on Cannon's (2002) theoretical framework in which the spatial representation of death is linked to distinctions between different types of memory.

Overall, this discussion is meant to supplement rather than replace the conclusions presented in previous chapters and, similar to a recent presentation by Charles and Buikstra, it represents an exploratory "attempt to push interpretation as far as the "evidence" will allow (2002:16)." As such, this narrative generates as many questions as it purports to answer, and it should be considered an initial attempt to move the discussion of Cis-Baikal mortuary practices away from the rather technical and descriptive research that has characterized the literature thus far—including the research presented in the previous chapters of this dissertation.

6.1 MEMORY, ANCESTORS, AND THE SPATIAL REPRESENTATION OF DEATH

Over the past two decades archaeologists have increasingly emphasized that mortuary rituals are social practices that vary with both the relations among the dead and among the living (e.g., Cannon 1989; Parker Pearson 1982, 1993). From this perspective, funerals are seen as ritual performances during which the living can actively establish, legitimize and renegotiate social, political, and economic relations, rather than simply a medium in which such relations are passively reflected (e.g., Cannon 1989; Parker Pearson 1982, 1993). Closely related to these concerns has been the renewed emphasis placed first on the role of ancestors in shaping the lives of the living (Rakita and Buikstra 2005) and second on the importance of mortuary sites and landscapes—particularly monumental places—as mnemonic loci for history and memory (e.g., Barrett 1994; Bradley 1991, 1998).

Cannon (2002) provides a useful framework with which to accommodate the relationships between memories of ancestors and the spatial representation of death. He begins from two related observations: first, mortuary rituals act as one means through which the living can reaffirm memories of their ancestors, and second, that memory is often encoded in spatial metaphors. Together these propositions provide the conceptual link between the spatial dimension of mortuary practices and memory:

> Given the widespread desire to maintain memory in response to death, and the equally widespread, if not universal, link between memory and space, it is not at all surprising that mortuary practices often center on the placement and spatial representation of the dead. [Cannon 2002:192]

Furthermore, Cannon argues that memory and the spatial representation of death are related in predictable ways such that "the scale and form of mortuary expressions are a function of the social and political scale for which memories are relevant and the circumstances in which their representation remains meaningful and effective (Cannon 2002:191)." In particular, he makes the distinction between three types of memory (personal, social, symbolic), each of which maintains relevance at different spatial and temporal scales.

First, in the context of death, *personal memory* relates to memorializing practices conducted by and for individuals who maintain personal, direct knowledge of the deceased individual (i.e., the immediate family or kin group). Given that such practices are only meaningful for a limited number of people, we should expect that they would take place in a similarly restricted area—probably close to home—and that these practices would only remain relevant for as long as active personal knowledge of the individual could be maintained (i.e., 1–2 generations). Cannon cites Maya house burials (Gillespie 2002), in which individuals were interred beneath the floors of descendants' households, as an example of mortuary practices that were designed to maintain personal memory. The location of such burials ensured that the individuals with personal knowledge of the deceased would be able to maintain an active engagement with the deceased, but these practices would not have provided the basis for more abstract remembrance beyond the immediate social group.

Social memory, on the other hand, is more abstract and is associated with memorializing practices related to larger social collectives. Consequently, personal direct knowledge of the deceased individual is not required for such practices to remain meaningful. Instead, Cannon argues that such practices "must be defined and maintained through ritual actions such as processions and commemorative ceremonies and through spatial representations such as cemeteries and mounds that are visible and meaningful to all for whom some form of remembrance has relevance (Cannon 2002:192)." The spatial scale of such practices, while clearly larger than practices grounded in personal memory, will vary depending on the scale of the intended audience (Cannon 2002: 193). As examples, Cannon cites Goldstein's (1981) interpretation of rows of graves in Mississippian cemeteries as reflecting kinship groups. At a larger scale, he points to the Middle Archaic cemeteries of the American Midwest, which are interpreted by Buikstra and Charles (1999; see also Charles and Buikstra 2002) as relating to local communities. Finally, he refers to the mound complexes constructed by Midwestern Middle Woodland cultures as expressions of social memory that were relevant to people on a regional scale. Likewise, temporal scales will also vary depending on the length of time that the meaning of such practices can be maintained in the face of changing social and political circumstances.

Finally, Cannon briefly discusses the highly abstract and formalized practices associated with *symbolic memory*, in which "death and burial mark an occasion for celebrating the power of the state (Cannon 2002: 193)." He offers the sacrifice burials at

Teotihuacan as an example (Sugiyama 1989), and points out that beyond the sacrificial performance, it is unlikely that the deceased individuals would continue to be referenced by any collective larger than their own families. That is, the role of the dead in these cases did not extend beyond the event of their own death.

In providing a theoretical basis to link the form and scale of mortuary practices with scales of memory abstraction, Cannon's framework offers one means of approaching the variation documented both within and between Bronze Age mortuary sites in the Little Sea microregion.

6.2 DEATH AND MEMORY IN THE LITTLE SEA MICROREGION

Before addressing the variation in Bronze Age mortuary practices, however, it is necessary to consider the broader cultural context in which such practices were established (Chapman 2005). Unfortunately, compared to broadly analogous case studies such as Charles and Buikstra's (2002) research on Archaic and Woodland hunter-gatherers in the American Midwest (see also Buikstra and Charles 1999), we are still in the early stages of assembling such contextual information for the Little Sea area of eastern Siberia. Nevertheless, the information that we do have permits us to make some general observations—many of which parallel trends from these better-documented contexts.

Available radiocarbon data indicate that after the Middle Neolithic hiatus in the use of visible mortuary sites, Late Neolithic Serovo peoples began to bury their dead under cairns of rocks on the slopes of the Little Sea shoreline somewhere around 4000 BC. Goriunova (1997) has described the results of excavations at eight Serovo mortuary sites

(34 graves) and, although her summary was primarily culture-historical in nature, we can say that such sites were generally small (i.e., fewer than ~15 graves) and exhibited little in the way of obvious internal spatial organization. In addition, it does not appear that individuals—either within or between sites—were distinguished in terms of status or group affiliation (Goriunova 1997).

The Late Neolithic was also characterized by a growing regional population (Weber et al. 2002) and there was likely a trend towards greater sedentism in relation to the presumed high mobility characterizing groups during the preceding Middle Neolithic (Weber et al. 2005). It is important to note at this point that the concept of sedentism for hunter-gatherers does not necessarily require year-round occupation of the same site, but instead implies a more regular and consistent degree of site reoccupation as well as more frequent task group mobility (Bergsvik 2001). Despite the increasing sedentism, the growing regional population would have ensured that groups were in frequent contact. Recent stable isotope analyses also suggest that, while residential mobility may have been decreasing, both Late Neolithic and Bronze Age individuals were still moving quite extensively—possibly even between the three main Cis-Baikal microregions (Weber et al. 2003).

From a broader spatial perspective, it is important to consider that mortuary sites along Baikal's western coast were placed almost exclusively on the shores of Little Sea. As discussed in Chapter 1, this area is among the most productive locales for littoral fishes on the entire lake, and its shallow bays and coves would not have required the deep-water fishing technology that would have been necessary elsewhere on the lake. Binford (2001) and Kelly (1995) both note that sedentism among hunter-gatherers in northern climates is almost exclusively associated with the use of aquatic resources. The area's transitional steppe-forest ecology would also have contributed to a high diversity of terrestrial resources. It seems obvious, therefore, that this area would have provided a particularly favourable environment for regular occupation by hunter-gatherers.

It is also important to recognize that Serovo graves were placed in highly conspicuous locations on the slopes of bays and peninsulas that would have been clearly visible whether approaching the area by land or water. The association between increased sedentism, introduction of highly visible burial grounds, and the restricted nature of the Little Sea's fishing resources seems to fit well with the expectations of Saxe's (1970) Hypothesis 8. Briefly, as modified by Goldstein (1981:61), this hypothesis links the use of a "permanent, specialized, bounded area for the exclusive disposal of the group's dead" with the ancestral legitimation of corporate group control over "crucial but restricted resources." While this proposition has been strongly criticized as overly functional by post-processual archaeologists, notably Hodder (1982a:53), it does seem to maintain broad ethnographic support (e.g., Carr 1995; Goldstein 1980, 1981) and has been successfully applied in other instances of hunter-gatherer cemetery use (e.g., Charles and Buikstra 1983). Morris (1991) attributes much of the criticism against the use of this hypothesis to the initial backlash against neo-evolutionary approaches in the 1980s, and he notes that in "this case – and, I suspect, in many others – the angry differences between 'new' and 'postprocessual' archaeologists seem to be more about form than content (1991: 163)." While Morris cautions that the Saxe/Goldstein hypothesis is not nomothetic and "will only be one way among many to read a complex discourse . . . it is a rewarding idea, which, if used carefully and with due regard for human agency, can stimulate research into new areas of ancient society (1991: 163)."

Indeed, in the present context it would be risky to take the interpretation of Late Neolithic corporate groups too far, especially considering the small size and lack of obvious spatial organization at Serovo mortuary sites. As Goldstein notes:

> The evidence supporting the hypothesis suggests that if there is a formal bounded disposal area, used *exclusively* for the dead, then the culture is probably one which has a corporate group structure in the form of a lineal descent system. The more organized and formal a disposal area is, the more conclusive this interpretation.
> [Goldstein 1981: 61, emphasis in original]

Finally, although we are not currently in a position to associate particular mortuary sites with specific habitation sites, available data suggest that habitation sites would have been located on the flat shorelines below the slopes on which the cemeteries were placed (Goriunova and Svinin 1995, 1996, 2000). As such, the graves would have been visible from the habitation sites and so would have been important reference points on a daily basis. This implies that ancestors would have played a significant role in the daily life of the region's populations, and that the dead were not only referenced during the limited context of mortuary rituals.

If we relate the above discussion to Cannon's (2002) framework, it would appear that Serovo sites might have expressed some degree of social memory, particularly with respect to claims of ancestral rights over the restricted hunting and fishing locales in the various Little Sea bays. At the same time, the small size and lack of obvious spatial organization of these sites suggests that this social memory likely emerged from a basis in personal memory rather than being defined from the outset. That is, it seems likely that these sites developed through a rather simple process of accretion.

> As successive burials accumulate within a common space, personal memory of the recent dead blends with social memory of the forgotten dead and with daily perceptions of the living to reinforce an identity and existence that transcend the individual and his or her generation. [Cannon 2002: 194]

In the Serovo context, while the "founder" burials may have had their basis entirely in personal memory—which seems entirely plausible considering the assumed proximity of such burials to habitation sites and the fact that so many sites contain very few graves—the continued accumulation of burials at some places would not only have reflected a growing sense of collective identity, but would have played an active role in constructing and maintaining this identity. Nevertheless, it is clear that the scale of this emergent social memory was likely small—perhaps relating to only a single lineage or band—and beyond marking the locations of groups in space would likely not have been meaningful on a larger scale. As we will see, this contrasts with at least some of the mortuary sites constructed during the Bronze Age.

Overall, then, when Bronze Age graves appeared in the region around 3000 BC, they would have been placed within a landscape that was already pregnant with visible mortuary remains. In many cases these new graves were placed in the same general locations as the existing Serovo graves, and in some cases, such as Uliarba, existing Serovo graves were actually incorporated within Bronze Age cemeteries suggesting an appropriation of existing ancestral and perhaps corporate relationships. At the same time, the heterogeneity of Bronze Age sites implies that these hunter-gatherers did not simply recapitulate earlier mortuary practices. Instead, such variability appears to at least partly reflect changes in social relationships both among the living and between the living and the dead.

First, it is clear that at least some Bronze Age mortuary sites did not develop through the same kinds of simple accretional process that characterized Late Neolithic mortuary sites. The obvious rows of graves and spatial clusters at cemeteries such as KN XIV and Uliarba imply that such sites may have been designated as the focus of social memory from the outset. This, in turn, suggests that the use of ancestors as a medium through which to express collective relationships was somewhat more formalized than in the past. The reasons for this formalization are not entirely clear, but it seems plausible that it may have been a response to an increasingly contested landscape in the context of intensification of the earlier trends towards increased sedentism and expanding regional populations. From this perspective, the "emergent" social memory of small bands or families associated with accretional cemetery development might have been insufficient to maintain or enforce territorial relationships with outside groups. In other words, the meaning and authority of such small sites may not have been sustainable beyond the local scale and thus were increasingly irrelevant in the face of changing social, political, and economic circumstances.

One means of addressing this problem would be to formalize the use of ancestors to create and maintain collective relationships, as well as to increase the social and political scale for which such ancestors would be relevant. In this context, the rows and clusters at the large sites of KN XIV, Uliarba, and perhaps Khadarta IV clearly demonstrate the representation of broader scales of social distinctions. The nature of these distinctions is not entirely obvious, but it seems likely that rows may represent kinship lineages, which suggests that these sites would have been meaningful for multi-family collectives rather than only local individual groups. As discussed above, the demarcation of these formally defined lineages would also provide a more secure basis for corporate claims over local resources. As suggested in Chapter 5, then, these large sites likely represent community cemeteries where several family units would have congregated on a regular—probably seasonal—basis to bury their dead, exchange information and raw materials, arrange marriages, and to establish, reaffirm, and negotiate intercommunity relations. The proximity and visibility of the mortuary sites, which presumably overlooked the habitation sites, suggests that ancestors were likely active participants in these interactions.

In addition to formalizing the use of ancestors to encode larger scales of social memory, however, it also appears that Bronze Age hunter-gatherers began to use mortuary practices as a means to single out individuals on the basis of social distinctions including, apparently, status. Since Okladnikov's work in the 1950s very little research in the Cis-Baikal has been dedicated to the topic of status groups or their material correlates, and consequently there are no established criteria for recognizing high status burials in the region. Nevertheless, the fact that the survey in Chapter 5 revealed repeated patterns of spatially segregated individuals interred with large, diverse artifact assemblages, including such rare items as bronze medallions and nephrite axes, knives, and lunar pendants, certainly suggests the emergence of status distinctions.

The basis for these status differences is more difficult to interpret. During the analysis of KN XIV, Uliarba, and Shamanskii Mys, I proposed that such individuals may simply have been particularly skilled and respected hunters and fishers—both in a physical sense and in terms of their ability to direct ritually the hunt. However, the possibility that such distinctions may represent broader trends associated with the aspirations of an incipient "elite" should not be discounted. It has been well documented that one avenue to formalized status among hunter-gatherers is the accumulation of knowledge and ritual power (e.g., Barrett 1994; Schulting 1998). The fact that status differences were encoded through spatial patterning in Bronze Age mortuary practices hints at the possibility that such individuals were expanding the scope of their ritual power to include the direction of mortuary practices.

Interestingly, the fact that such high status individuals were interred at both community sites such as KN XIV and Uliarba and specialized sites such as Kurma XI and Shamanskii Mys may reflect some ambiguity in their relationship both with ancestors and with the living. As Cannon points out:

> A common setting for the community's collective dead may seem contradictory to the status aspirations of an emerging or would-be elite, but the desire to sustain social memory also allows an opportunity for an elite segment of the population to enhance their prominence through direction of ritual performances and monument construction. [Cannon 2002: 194]

There appears, then, to have been some variation in the strategies employed by these would-be elites. On the one hand, such individuals were attempting to distinguish themselves from the larger group through interment at exclusive, specialized burial grounds, while on the other hand they may also have been attempting to assert increasing control over the larger collective through direction of ritual practices at community cemeteries. Regardless of whether or not these individuals constituted an incipient elite, their distinctive interments—both at cemetery and regional scales—would have presented a fundamental contradiction. Namely, at the same time that there was a push for an increasing emphasis on formalizing and maintaining larger social collectives at sites such as Uliarba and KN XIV, there were simultaneous attempts to fracture these collectives through the recognition of individual status distinctions. In fact, when taken as a whole, the variability in the scale and form of Bronze Age sites seems to imply a general instability or ambiguity in the role of the ancestors and the associated scale of social memory at which these roles would have been meaningful. In some cases the dead were referenced as a means of establishing and maintaining kinship lineages and community identity, in other cases the dead were used as a medium to establish status distinctions, and in still other cases deceased individuals do not appear to have been interred within any sort of social collective as, for example, at those sites containing only one or two graves. This presents us with an interesting scenario. In previous chapters I suggested that the enduring social practices observed at KN XIV likely reflected a context characterized by relatively stable social and political relations; however, when examined against the backdrop of the Bronze Age mortuary record as a whole, it might be more appropriate to consider KN XIV as a particularly exceptional attempt to create and maintain stability in the face of a changing cultural landscape. Again, Cannon anticipates the potential for such a possibility:

> Extraordinary efforts to preserve the spatial representation of social memory may actually be more indicative of the failure of social and political structures than of their transcendent emergence. [Cannon 2002: 196]

There is no doubt that KN XIV, as the largest and most structured cemetery in the entire region, would have acted as a particularly important visible expression of the stability and identity of the community and, indeed, would likely have played an important role in establishing and maintaining this identity against challenges from both outside groups and emerging internal inequalities.

6.3 CONCLUSIONS

The narrative just presented has attempted to accommodate observed variation in the scale and form of Bronze Age mortuary sites in the Little Sea microregion by suggesting that this variation reflects a rather dynamic cultural context in which ancestors were used by the living for numerous, often contradictory, purposes.

First, it was suggested that at least some cemeteries may represent evidence for the existence of corporate groups who used ancestors to justify control over local hunting and fishing grounds, and that these relationships likely had their roots in the preceding Late Neolithic. Unlike this preceding period, however, it appears that the social memory encoded at large well-organized Bronze Age cemeteries such as KN XIV and Uliarba did not emerge solely through a gradual process of accretional cemetery development, but rather that such relations were somewhat more formalized. In addition, while Late Neolithic mortuary sites would likely only have been meaningful to local bands or families, large Bronze Age cemeteries would have been meaningful for seasonally aggregating multi-family communities consisting of several kinship lineages.

Finally, it was proposed that the increased formalization and larger scale of social memory manifested at large Bronze Age cemeteries was an attempt to reinforce the stability and identity of the community in reaction to increasing competition from external groups as well as increasing fragmentation as a result of emerging social distinctions. With respect to the latter it was suggested that Bronze Age hunter-gatherers increasingly employed mortuary placement—both within and between sites—to distinguish individuals on the basis of status. Such individuals may even have constituted an incipient or would-be elite.

Overall, the account presented in this chapter should, at the very least, provide the foundation for an alternative means of addressing the mortuary record of prehistoric hunter-gatherers in the Cis-Baikal. Such exploratory and interpretive approaches to this material have been conspicuously absent, and are greatly needed to help begin the process of integrating the existing descriptive literature into more comprehensive and interesting syntheses.

Chapter 7
Conclusion

The goal of this study was to explore variation in mortuary practices both within and between Lake Baikal Little Sea Bronze Age cemeteries from a perspective that considered such sites as meaningful places created through dynamic social processes, rather than as simply collections of culture-historical traits. The general methodology was exploratory and was organized around a multiscalar examination of mortuary variability with a particular focus on how that variability was encoded in space. After establishing a reliable temporal framework at both local and regional scales of analysis (Chapter 3), the exploration of mortuary variability followed a “bottom-up” approach, beginning with the detailed examination of original data from the site of Khuzhir-Nuge XIV (Chapter 4). The results of this analysis were then compared with patterns of variability derived from more general observations at 19 neighbouring sites (Chapter 5). Finally, an attempt was made to synthesize this material in order to understand how the entire Little Sea Bronze Age mortuary record might have been articulated within a dynamic and changing cultural landscape (Chapter 6). This approach has produced a number of new insights relating to both Little Sea Bronze Age mortuary practices in particular and Cis-Baikal Middle Holocene hunter-gatherer culture dynamics in general. In this chapter I summarize the major research results and briefly discuss potential future research directions.

7.1 TEMPORAL ASPECTS OF CEMETERY USE

The chronological framework at both local and regional scales of analysis was developed through an evaluation of radiocarbon dates and has produced some of this dissertation's most important contributions. First, I was able to determine not only the duration but also the tempo of use at the site of KN XIV. Previously, such information for Cis-Baikal mortuary sites was entirely absent, which limited the ability to make meaningful intra- and intersite comparisons. In addition, the comprehensive analysis of radiocarbon dates at KN XIV demonstrated very clearly that intrasite variability in mortuary practices was not related to chronological changes and so, instead, must have socio-political or cosmological significance. This contrasts fundamentally with the interpretation of mortuary variability at most sites in the region over the last 50 years, where non-normative mortuary practices have been almost exclusively attributed to changes through time. Indeed, an evaluation of the chronological distribution of virtually every attribute of mortuary practice at KN XIV suggests that such practices were remarkably stable in chronological terms.

Next, at the mesoscale, the analysis of radiocarbon dates demonstrated that a number of mortuary sites in the restricted area of the Little Sea microregion were used simultaneously. This provides a foundation to explore the cultural significance of intersite variability and to begin the process of establishing the nature of the entire Bronze Age mortuary landscape and socio-political relations.

At the macroscale, the comparison of radiocarbon dates across the entire Cis-Baikal clarified chronological relationships between the various mortuary traditions. Of particular significance is the conclusion that the Middle Neolithic hiatus in the use of formal cemeteries may extend for as long as 1,200 years rather than the 600–800 as previously estimated (Weber 1995). Likewise, it appears that the duration of each of the traditions on either side of the hiatus was likely shorter than previously believed. As such, the Serovo and Bronze Age mortuary traditions appear to be distinct in chronological terms. This suggests that the analytical unit Serovo-Glazkovo ought to be uncoupled to reflect this situation.

Evaluation of radiocarbon data in this study has produced some important contributions to the methodology of examining large sets of dates that should have significance beyond the Cis-Baikal. More specifically, it was confirmed that radiocarbon dates derived from bone samples with less than 1% collagen are susceptible to contamination—particularly in contexts where there has been extensive use of fire. This effect is not only relevant at mortuary sites but should be equally important at habitation sites where, for example, radiocarbon dates are often derived from bones recovered from hearth contexts. While this conclusion is not at all surprising, the failure to account for collagen yields in Cis-Baikal has almost certainly contributed to the lack of agreement between radiocarbon and typological dating methods, and the consequent reluctance of some scholars in the region to accept the use of radiocarbon dates to refine local chronological sequences. It would not be surprising to find that this was also the case elsewhere.

Finally, it was determined that stochastic measurement errors are significant factors when dealing with large sets of ^{14}C dates since these errors have the effect of creating a distribution of dates that is artificially wider and flatter than the original. This conclusion has serious consequences for estimating the durations of both individual cemetery use and regional expressions of mortuary practices. As far as I am able to determine, this effect has never been comprehensively discussed in the context of dating archaeological materials. Thus, the methodology based on Bayesian statistical methods introduced in this study provides a useful approach to recognize and account for such errors during interpretation and, as such, it has great potential to help clarify chronological patterns at other Cis-Baikal cemeteries and elsewhere.

7.2 MORTUARY VARIABILITY AND SOCIAL ORGANIZATION

The most important result to come out of the exploration of Bronze Age mortuary variability in the Little Sea microregion was the documentation of a previously unrecognized degree of heterogeneity between cemeteries. Even though all of the examined mortuary sites share a number of features that unite them within a coherent tradition, these similarities belie the fact that each site is unique in a number of important respects including: size, demographic structure, internal spatial organization, and quantity and diversity of grave inclusions. In order to account for this diversity, a working hypothesis was generated that linked the form and scale of mortuary practices with the scale of the social unit using the cemeteries.

In short, it was suggested that the Little Sea Bronze Age mortuary record does not reflect a situation in which individual communities were using single cemeteries. Instead, the picture appears to be rather more complicated, in which a regional community of Bronze Age hunter-gatherers maintained a range of different types of mortuary sites.

More specifically, it was suggested that at least some of the observed intersite diversity could be attributed to the distinction between community cemeteries that would have been relevant to large—probably multifamily—social units and more specialized exclusionary sites that would have been relevant to smaller social units such as status groups. Furthermore, it was proposed that large, well-organized community cemeteries such as KN XIV might represent exceptional attempts to reinforce conceptions of communal social identity in the face of increasing competition from external groups as well as increasing internal fragmentation as a result of emerging status distinctions.

7.3 FUTURE RESEARCH

Based on the research results derived in this dissertation a number of avenues for future exploration can be identified.

Having demonstrated the utility of comprehensive radiocarbon analysis at KN XIV, it would be beneficial if similar studies could be completed at other cemeteries in the surrounding region. The forthcoming publication of dates from the neighbouring site of Kurma XI promises to provide an excellent comparative dataset. In addition to dating large sites, however, the examination of smaller sites must also be seen as a priority. While most Bronze Age individuals were interred in one of the larger cemeteries such as KN XIV or Uliarba, the vast majority of mortuary sites in the area are much smaller. The few dates that we do have from these smaller sites suggest that they were directly contemporaneous with the larger sites; however, it would be helpful to establish more firmly the extent to which this is true more generally.

It is also necessary to define more clearly the scale and character of the social units using various Bronze Age cemeteries. While this study has identified a distinction between community cemeteries and specialized high-status sites, there is no reason to believe that these were the only important distinctions. Furthermore, both the status and community distinctions identified in this study require refinement. With respect to status groups, for example, it is still uncertain on what basis this status was derived. It is also not entirely clear why some high status individuals were interred within specialized sites, while other apparently similar individuals were interred within community cemeteries. Dedicated research into this phenomenon may be able to identify finer-resolution distinctions.

The interpretation that some sites represent community cemeteries depends largely on the assumption that the rows of graves observed at these sites manifest kinship lineages. As such, independent verification of this assertion would definitely be a productive avenue for future research. BAP is currently investigating the potential of DNA analysis of skeletal remains from KN XIV, which would certainly help in this regard. In addition, Caroline Haverkort, a post-doctoral researcher with BAP, is examining stable isotope signatures of individuals from KN XIV in order to interpret differences in diet and relative degrees of mobility. More specifically, this study is comparing the isotopic signatures of tooth enamel, which does not undergo chemical remodeling through life and so reflects diet at the time that the enamel was formed (i.e., various stages of childhood), with signatures from bones, which reflect approximately the last 10 years of life. Significant differences between an individual's isotopic ratios from teeth and bone would imply that the person resided in a different location during childhood than adulthood.

This, in turn, should permit the identification of individuals who were immigrants to the area as opposed to those individuals who spent their entire lives in the region. Overall, then, this analysis has the potential to inform us about a wide range of social relationships including such aspects as post-marital residence pattern and kinship.

At another level, in order to gain a comprehensive understanding of Bronze Age mortuary practices in Cis-Baikal it is necessary to integrate data from the preceding Late Neolithic. As the first widespread mortuary tradition in the Little Sea area, the Late Neolithic Serovo established the basic pattern on which later groups would build for at least the next 2000 years and probably longer. One particularly intriguing phenomenon that was only touched on in this dissertation is the referencing of Late Neolithic Serovo graves by later Bronze Age peoples. While I suggested that this might represent an appropriation of ancestral or corporate relationships, this interpretation requires more comprehensive analysis. For example, later groups did not incorporate every Serovo cemetery, and evidence idicates that not every Bronze Age site was constructed around existing Serovo graves. Therefore, establishing the particular social and political contexts under which Glazkovo peoples referenced Serovo graves would seem to be an important new research goal.

One important study that is currently underway is the analysis of Kurma XI (Metcalf n.d.). Given that this site was identified here as an exclusionary cemetery, it will provide a valuable comparison with KN XIV and should help to clarify the nature of the relationships between community and specialized sites.

Next, although the analysis of radiocarbon dates conducted in this study extended to the macroscale, it was beyond the scope of this dissertation to relate these chronological patterns to local mortuary variability in the Angara and Lena Valleys. The comparison between the three Cis-Baikal microregions has the potential to provide further insights into the regional character of Middle Holocene mortuary practices.

Lastly, it is important that the results presented here be integrated with data from habitation sites. Currently we know next to nothing about the scale, duration, or seasonality of hunter-gatherer occupation in the Little Sea area. As such, it is unclear how mortuary sites would have been integrated within the daily lives or yearly cycle of these foragers. This would seem to be particularly important for evaluating the suggestion that at least some cemeteries represent territorial corporate groups in the context of bounded and restricted resources. In this study the definition of those resources was rather vague, but it is now necessary to establish in more detail the material and non-material resource exploitation patterns of these ancient foragers.

7.4 CONCLUDING REMARKS

The research described in this dissertation represents only a small portion of a much larger collective endeavor to describe and explain processes of culture change among Middle Holocene hunter-gatherers in the Cis-Baikal. As should be clear from the descriptions of the material presented here, the Cis-Baikal offers a wealth of information that has global significance for the investigation of foraging cultures worldwide. To conclude, then, I would like to reiterate a comment I made in the introduction. References to Cis-Baikal materials in the non-Russian literature are practically non-existent. As such, if nothing else, I hope that this study contributes to the wider recognition of both the long and distinguished history of Russian research in the region as well as the lives of the Middle Holocene hunter-gatherers who inhabited this unique part of the world.

REFERENCES CITED

Agapitov, N.N. 1882. *Pribaikal'skie drevnosti.* VSORGO 12(4-5):1-22.

Aitken, M.M. 1990. *Science-based dating in archaeology.* Longman, London.

Ambrose, S.H. 1990. Preparation and characterization of bone and tooth collagen for isotopic analysis. *Journal of Archaeological Science* 17: 341–451.

Anuchin. L.A. 1879. Opisanie predmetov vystavki: Otdel ist. Izvestiia. O-va liuvitelei estestvoznaniia, antropologii, I etnografii, Moscow. Un-te. 25(2) vyp. 1.

Aseyev, I.V. 2002. The Kitoi culture and its place in the classification of Neolithic cultures of the circum-Baikal area and contiguous regions: chronometry and migration areas. Archaeology, Ethnology and Anthropology of Eurasia 2(10):59-70.

Baruzdin Iu.D., N.G. Gorbunova, and M.N. Pshenitsyna. 1992. Poselenie i mogil'niki bukhty Sagan-Nuge. In Masson, V. M. (ed.), *Drevnosti Baikala*, pp. 56–89. IGU, Irkutsk.

Barrett. J. 1994. *Fragments from Antiquity: an archaeology of social life in Britain, 2900-1200 BC.* Blackwell Press. Oxford.

Baxter M.J. 1994. *Exploratory multivariate analysis in archaeology.* Edinburgh University Press, Edinburgh.

Bazaliiskii, V.I. 2003. The Neolithic of the Baikal Region on the basis of mortuary materials. In: A. Weber and H. McKenzie (eds.), *Prehistoric Foragers of the Cis-Baikal, Siberia*, pp. 37-50. Canadian Circumpolar Institute Press. Edmonton.

Bazaliiskii, V.I. 2005. K probleme kul'turno-istoricheskikh osobennostei pogrebal'nykj kompleksov epokhi pozdnego mezolita – neolita Baikal'skoi Sibiri. In: A.V. Kharinskii (ed.), *Sotsiogenez v Severnoi Azii*, pp. 25-41. IGTU, Irkutsk.

Bazaliiskiy, V.I. and N.A. Savelyev. 2003. The wolf of Baikal: the "Lokomotiv" Early Neolithic cemetery in Siberia (Russia). *Antiquity* 77: 20–30.

Beck. L.A.(ed.). 1995. *Regional approaches to mortuary analysis.* Plenum Press, New York.

Bergsvik, K.A. 2001. Sedentary and mobile hunter-fishers in Stone Age Western Norway. *Arctic Anthropology* 38(1):2-26.

Binford, L.R. 1971. Mortuary practices: their study and their potential. In: J. Brown (ed.), *Approaches to the Social Dimensions of Mortuary Practices*, pp. 6-29. Memoirs of the Society for American Archaeology, No. 25. Washington.

Binford, L.R. 2001. *Constructing frames of reference*. University of California Press, Berkeley–Los Angeles.

Bloch, M. and J. Parry (editors). 1982. *Death and the regeneration of Life*. Cambridge University Press, Cambridge.

Bowman, S. 1990. *Interpreting the past: radiocarbon dating*. British Museum Publications, London.

Bradley, R. 1991. Ritual, time and history. *World Archaeology* 23:209-219.

Bradley, R. 1998. *The Significance of monuments: on the shaping of human experience in Neolithic and Bronze Age Europe*. Routledge. London.

Bronk Ramsey, C. 1995. Radiocarbon calibration and analysis of stratigraphy: The OxCal program. *Radiocarbon* 37:425–30.

Bronk Ramsey, C. 2001. Development of the radiocarbon program OxCal. *Radiocarbon* 43:381–9.

Bronk Ramsey, C. 2003. User Manual. OxCal ver. 3.9. Duplicated.

Brown, J.A. 1971 (editor). *Approaches to the social dimensions of mortuary practices*. Memoirs of the Society for American Archaeology No. 25. Washington, D.C.

Brown J.A. 1995. On mortuary analysis-with special reference to the Saxe-Binford research program. In: L.A. Beck (ed.), *Regional Approaches to Mortuary Analysis*, pp 3-26. Plenum Press, New York.

Brunello, A.J., Molotov, V.C., Dugherkhuu, B., Goldman, C, Khamaganova, E., Strijhova, T., and R. Sigman. 2003. *Lake Baikal management initiative experience and lessons learned brief*. Tahoe-Baikal Institute.

Buck, C.E., C.D. Litton, E.M. Scott. 1994. Making the most of radiocarbon dating: some statistical considerations. *Antiquity* 68:252–63.

Buck, C.E., W.G. Cavanagh, C.D. Litton. 1996. *The Bayesian approach to interpreting archaeological data*. Wiley, Chichester.

Buikstra, J.E. and D.H. Ubelaker. 1994. *Standards for data collection from human skeletal remains*. Research Series No. 44. Arkansas Archaeological Survey. Fayetteville.

Cannon, A. 1989. The historical dimension in mortuary expressions of status and sentiment. *Current Anthropology* 30:437-58.

Cannon, A. 1996. Trends and motivations: scaling the dimensions of material complexity. In: D.A. Meyer, P.C. Dawson, and D.T. Hanna (eds.), *Debating Complexity: Proceedings of the Twenty-sixth Annual Chacmool Conference*, pp. 31-38. University of Calgary Archaeological Association, Calgary.

Cannon, A. 2002. Spatial narratives of death, memory, and transcendence. In: H. Silverman and D. Small (eds.), *The Space and Place of Death*, pp. 191-199. Archaeological Papers of the American Anthropological Association No. 11. Arlington.

Carr, C. 1995. Mortuary practices: their social, philosophical-religious, circumstantial, and physical determinants. *Journal of Archaeological Method and Theory* 2(2):105-200.

Chapman, R.W. 2005. Mortuary analysis: a matter of time. In: G.F.M. Rakita, J.E. Buikstra, L.A Beck, and S.R Williams (eds.), *Interacting with the dead: perspectives on mortuary archaeology for the new millennium*, pp. 25-40. University Press of Florida, Gainesville.

Chapman, R., I. Kinnes, and K. Randsborg (eds.). 1981. *The archaeology of death.* Cambridge University Press. New York.

Chard, C.S. 1958. Outline of the prehistory of Siberia: Part 1. The pre-metal periods. *Southwestern Journal of Anthropology* 14(1):1-33.

Chard, C.S. 1974. *Northeast Asia in prehistory*, The University of Wisconsin Press, Madison.

Charles, D.K., and J.E. Buikstra. 1983. Archaic mortuary sites in the Central Mississippi drainage: distribution, structure, and behavioral implications. In: J.L. Phillips and J.A. Brown (eds.), *Archaic Hunters and Gatherers in the American Midwest*, pp. 117-145. Academic Press, New York.

Charles, D.K., and J.E. Buikstra. 2002. Siting, sighting, and citing the dead. In: H. Silverman and D. Small (eds.), *The Space and Place of Death*, pp. 13-25. Archaeological Papers of the American Anthropological Association No. 11. Arlington.

Cherskii, I.D. 1880. Predvaritel'nyi otchiot o geologiheskom issledovanii beregovo; polosy oz. Baikal. VSORGO 11(1-2): 8-83.

Cherskii, I.D. 1895. O drevnostqx, izvestnyx v raione Ol'hxonskogo vedomstvaa. In: Semenov P.P., Cherskii I.D., Petts G.G. (eds.) *Zemlevedenie Azii. Vostochnaia sibir': ozero Baikal I Prebaikal'skie strany, Zabaikal'e I step' Gobi. Noveishie svedeniia ob etix stranakh (1832-1894 gg.)* – Saint Petersburg, Ch. 2 S. 492-508.

Chesson, M.S. 2001 (editor). *Social memory, identity and death: anthropological perspectives on mortuary rituals*. Archaeological Papers of the American Anthropological Association No. 10. Washington.

Christen, J.A. 1994. Summarizing a set of radiocarbon determinations: a robust approach, *Applied Statistics*, 43(3): 489–503.

Colman, S.M., Peck, J.A., Karabanov, E.B., Carter, S.J., Bradbury, J.P., King, J.W., Williams, D.F. 1995. Continental climate response to orbital forcing from biogenic silica records in Lake Baikal. *Nature* 378, 769–771.

Colman, S.M., Jones, G.A., Rubin, M., King, J.W., Peck, J.A., Orem, W.H. 1996. AMS radiocarbon analyses from Lake Baikal, Siberia: challenges of dating sediments from a large, oligotrophic lake. *Quaternary Science Reviews* 15, 669–684.

Debets. G.F. 1930. Antropologicheskii sostav naseleniia Pribaikal'ia v epokhy pozdnego neolita. *Russkii Antropoogicheskii Zhurnal* 19(1-2):7-50.

Demske, D., Heumann, G., Granoszewski, W., Nita, M., Mamakowa, K., Tarasov, P.E., Oberhansli, H. 2005. Late Glacial and Holocene vegetation and regional climate variability evidenced in high-resolution pollen records from Lake Baikal. *Global and Planetary Change* 46(1–4), 255–279.

Dillehay, T. 1990. Mapuche ceremonial landscape, social recruitment and resource rights. *World Archaeology* 22(2): 223-41.

Drouin, B. 2005. *Grave Architecture at Khuzhir-Nuge XIV.* M.A.thesis, University of Alberta, Edmonton

Ezzo, J.A., Weber, A.W., Goriunova, O.I., and V.I. Bazaliiskii. 2003. Fish, flesh, or fowl: in pursuit of a diet-mobility-climate continuum model in the Cis-Baikal. In: A. Weber and H. McKenzie (eds.), *Prehistoric Foragers of the Cis-Baikal, Siberia*, pp. 123-131. Canadian Circumpolar Institute Press. Edmonton.

Feld, S., and K. Basso (eds.). 1996. *Senses of place.* School of American Research Press. Santa Fe.

Fleiss J. L. 1981. *Statistical methods for rates and proportions. Second edition.* John Wiley and Sons, Inc., New York.

Forsyth, J. 1992. *A history of the peoples of Siberia.* Cambridge University Press. Cambridge.

Galazii G.I. (ed.). 1993. *Baikal atlas.* Federal Service of Surveying and Cartography, Moscow, Russia.

Georgievskaia, G.M. 1979. *Kitoiskaia kul'tura Pribaikal'ia.* Ph.D. dissertation summary, AN SSSR, Novosibirsk.

Georgievskaia, G.M. 1989. *Kitoiskaia kul'tura Pribaikal'ia.* Nauka, Novosibirsk.

Gerasimova, M.M. 1991. Cherepa iz Fofanovskogo mogil'nika (r. Oka, Selenga). In Masson, V.M. (ed.), *Drevnosti Baikala*, pp. 97-111. IGU, Irkutsk.

Gerasimov, M.M. 1955. *Osnovy vosstanovleniia litsa po cherepu.* Novaia seriia No. 27. Institute of Ethnography, AN SSSR, Moscow.

Goldstein, L.G. 1976. *Spatial structure and social organization: regional manifestations of Mississipian society.* Ph.D. dissertation, Northwestern University, Evanston.

Goldstein, L.G. 1980. *Mississippian mortuary practices: a case study of two cemeteries in the lower Illinois Valley.* Northwestern University Archaeological Program, Evanston.

Goldstein, L.G. 1981. One-dimensional archaeology and multi-dimensional people: spatial organization and mortuary analysis. In: R. Chapman, I. Kinnes, and K. Randsborg (eds.), *The Archaeology of Death*, pp. 53-69. Cambridge University Press, Cambridge.

Gorbunova, N.G, and M.N., Pshenitsyna. 1992. Poselenie i mogil'nik v bukhte Shide. In Masson, V. M. (ed.), *Drevnosti Baikala*, pp. 65-68. IGU, Irkutsk.

Goriunova, O.I. 1976. *K voprosu o sidiachikh pogrebeniakh v Pribaikal'e.* IGU, Irkutsk.

Goriunova, O. I. 1984. *Mnogosloinye pamiatniki Malogo Mor'ia i o.Ol'khon.* Ph.D. dissertation summary, AN SSSR, Novosibirsk.

Goriunova O.I. 1993. Otchet. Raskopki mogil'nika Khuzhir-Nuge XIV na Baikalye v 1992 g. (Ol'khonskii raion Irkutskoi oblasti). *Obozrenie resul'tatov polevykh i laboratornykh issledovanii arkheologov, ethnografov i antropologov Sibiri i Dal'nego Vostoka v 1992 g.* Novosibirsk: Institut arkheologii i etnografii SO RAN.

Goriunova O.I. 1995. Raboty Vostochno-Pribaikal'skogo Otriada v Priol'khon'e (Ozero Baikal). *Obozrenie resul'tatov polevykh i laboratornykh issledovanii arkheologov, ethnografov i antropologov Sibiri i Dal'nego Vostoka v 1993 g.* Novosibirsk: Institut arkheologii i etnografii SO RAN.

Goriunova, O.I. 1996. Pozdnii bronzovyi vek na territorii Pribaikal'ia. *Arkheologiia, anthropologiia, etnografiia Sibiri,* pp. 82-96. AGU, Barnaul.

Goriunova, O.I. 1997. *Serovskie pogrebeniia Priol'khon'ia.* Institut arkheologii i etnografii SO RAN, Novosibirsk.

Goriunova, O.I. 2002. *Drevnie mogil'niki Pribaikal'ia.* IGU. Irkutsk.

Goriunova, O.I. 2003. The Neolithic of the Ol'khon region (Lake Baikal). In: A. Weber and H. McKenzie (eds.), *Prehistoric Foragers of the Cis-Baikal, Siberia*, pp. 15-36. Canadian Circumpolar Institute Press. Edmonton.

Goriunova, O. I., and L.P. Khlobystin. 1992. Datirovka kompleksov poselenii i pogrebenii bukhty Ulan-Khada. In Masson, V. M. (ed.), *Drevnosti Baikala*, pp. 41-56. IGU, Irkutsk.

Goriunova, O.I. and L.A. Pavlova. 2003. Metallicheskie izdeliia iz pogrebenii mogil'nika bronzovogo veka Kurma XI (oz. Baikal). IGTU, *pp. 53-56.*

Goriunova, O.I., and V.I. Smotrova. 1981. Pogrebal'nye kompleksy mogil'nika Shumilikha: (analiz materialov I datirovka pamiatnika). *Bronzovyi vek Priangar'ia: Mogil'nik Shumilikha*, pp. 17-28. IGU, Irkutsk.

Goriunova O.I., and V.V. Svinin. 1995. *Ol'khonskii raion: materially k svodu pamiatnikov istorii I kul'tury Irkutskoi oblasti. Chast 1: ostrov Ol'khon*. Arkom. Irkutsk

Goriunova, O.I., and V.V. Svinin. 1996. *Ol'khonskii raion: materially k svodu pamiatnikov istorii I kul'tury Irkutskoi oblasti. Chast 2: ot mysa elokhin do mysa ulan*. Arkom. Irkutsk

Goriunova, O.I., and V.V. Svinin. 2000. *Ol'khonskii raion: materially k svodu pamiatnikov istorii I kul'tury Irkutskoi oblasti. Chast 3: ot mysa ulan do reki bol'shaia bugul'deika*. Arkom. Irkutsk

Goriunova, O.I. and A.W. Weber. 2002. Raskopki rossiisko-kanadskoi ekspeditsii na mogil'nike Kurma XI (oz. Baikal). *Problemy arkheologii, etnografii, antropologii Sibiri i sopredel'nyx territorii. Izd-vo In-ta arkheologii i etnografii* SO RAN 8:291-294. Novosibirsk

Goriunova, O.I. and A.W. Weber. 2003. Metallicheskie izdeliia iz pogrebenii mogil'nika bronzovogo veka Kurma XI (oz. Baikal). *Sotsiogenez severnoi Azii. Proshloe, nastoiashchee, budushchee*, pp. 331-353. Izd-vo IGU, Irkutsk.

Goriunova, O.I., A.G. Novikov, L.P. Ziablin, V.I. Smotrova. 2004. *Drevnie pogrebeniia mogil'nika Uliarba na Baikale*. Izd-vo IAE SO RAN. Novosibirsk.

Gorodtsov, V.L. 1924. Arkheologicheskie raskopki i razvedki v Sovetskoi Rossii s 1919 po 1923 god. *Drevnii mir* 1:1-20.

Gorodtsov, V.L. 1927. Bronzovoi vek v SSSR. *Bolshaia Sovetskaia Entsiklopediia* 7.

Gorodtsov, V.L. 1935. To the history of technical development in primitive stone working. *Sovetskaia Etnografiia* 2.

Greenacre M. and J Blasius (eds.). 1994. *Correspondence analysis in the social sciences.* Academic Press, San Diego.

Griaznov, M.P., and M.N. Komarova. 1992. Zadachi i itogi rabot Irkutskoi ekspeditsii. In: Masson, V. M. (ed.), *Drevnosti Baikala*, pp. 5-12. IGU, Irkutsk.

Griffin, J.B. 1960. Some prehistoric connections between Siberia and America. *Science*, 131:801-813.

Griaznov, M. P., and G.A. Maksimenkov. 1992. Zadachi i itogi rabot Irkutskoi ekspeditsii. In V. M. Masson (ed.) *Drevnosti Baikala*, pp. 5-13. IGU, Irkutsk.

Haeussler, A.M. 1993a. *Early Neolithic burials from Northeast Asia. Odontological analysis.* Paper presented at the International Symposium on Archaeology of the Northern Pacific, Vladivistok.

Haeussler, A.M. 1993b. *Siberian Kitoi Culture: its place in Paleo-Indian genealogy.* Paper presented at the Annual Meeting of the American Association of Physical Anthropologists, Toronto.

Hertz 1960 [1907]. *Death and the Right Hand.* Free Press, Glencoe.

Hirsch, E. and M. O'Hanlon (eds.). 1997. *The anthropology of landscape.* Clarendon Press, Oxford.

Hodder, I. 1982a. *Symbols in Action.* Cambridge University Press, Cambridge.

Hodder, I. 1982b. Theoretical archaeology: a reactionary view. In: I. Hodder (ed.), *Symbolic and Structural Archaeology.* Cambridge University Press, Cambridge, pp. 1-16.

Hofman 1986. *Hunter-gatherer mortuary variability: toward an explanatory model.* Unpublished Ph.D. dissertation. University of Tennessee, Knoxville.

http://meteo.infospace.ru/climate/html/index.ssi

Ingold, T. 2000. *The Perception of the environment: essays in livelihood, dwelling and skill.* Routledge. London.

Jelsma J. 2000. *A bed of ochre: mortuary practices and social structure of a maritime archaic Indian society at Port au Choix, Newfoundland.* Rijksuviversiteit Groningen, Groningen.

Jensen, C. K. and K. H. Nielsen. 1997. Introduction - towards a Danish burial archaeology. In C. K. Jensen and K. H. Nielsen (eds.), *Burial and Society: the chronological and social analysis of archaeological burial data*, pp.17-19. Aarhus University Press, Aarhus.

Jordan, P. 2002. *Material culture and sacred landscape.* Altamira Press. Walnut Creek.

Kachalova N.K., and C.C Chernikov. 1992. Mogil'niki v okrestnostiakh poselka Kharansy I ozera Elgai na ostrove Ol'khon. In Masson, V. M. (ed.), *Drevnosti Baikala*, pp. 77-83. IGU, Irkutsk.

Kashiwaya, K. (ed.). 2003. *Long continental records from Lake Baikal.* Springer-Verlag, Tokyo, Japan.

Katzenberg, M.A. and A.W. Weber. 1999. Stable isotope ecology and paleodiet in the Lake Baikal region of Siberia. *Journal of Archaeological Science* 26(6):651–659.

Katzenberg, M.A. 2004. Lake Baikal fish diets. Paper presented at the *Conference on Hunter-Gatherer Coastal Adaptations*, May 30–31, 2004, Aberdeen.

Kazantsev A.I. and P.P. Khorshikh. 1962. Starinnye buriatskie pogrebenniia na ostrove Ol'khon. Tr. *BKNII Ser Inst.* 10:179-188.

Kelly, R.L. 1995. *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways.* Smithsonian Institution Press, Washington.

Kharinskii, A.V, and N.S. Sosnovskaia. 2000. Mogil'nik bronzovogo veka Khadarta IV. *Baikal'skaia Sibir' v drevnosti* 2:66–100.

Khlobystin, L.P. 1964a. Mnogosloinoe poselenie Ulan_Khada na Baikale (po materialam razkopok B.E.Petri). *Kratkie soobshcheniia Instituta arkheologii*, 97:25-32.

Khlobystin, L.P. 1964b. *Drevnie kul'tury poberezh'ia oz. Baikal (kamennyi i bronzovyi veka).* Ph.D. dissertation summary, AN SSSR, Leningrad.

Khlobystin, L.P. 1965. Drevneishie pamiatniki Baikala. *Materialy i issledovaniia po arkheologii SSSR* 131: 252-296.

Khlobystin, L.P. 1969. The stratified settlement of Ulan-Khada on Lake Baikal. *Arctic Anthropology* 6(1): 88-94.

Khlobystin, L.P. 1972. Problemy sotsiologii neolita Severnoi Evrazii. In: *Okhotniki, sobirateli, rybolovy. Problemy social'no-ekonomicheskikh otnoshenii v dozemledel'cheskom obshchestve,* pp. 26-42. Nauka, Leningrad.

Khlobystin, L.P. 1978. Vozrast i sootnoshenie neoliticheskikh kul'tur Vostochnoi Sibiri. *Kratkie soobshcheniia Instituta arkheologii* 153:93-99.

Khlobystin, L.P. 1992. Drevnie pamiatniki zapadnogo poberezj'ia Malogo moria. In Masson, V. M. (ed.), *Drevnosti Baikala*, pp. 69-72. IGU, Irkutsk.

Khlobystina, M.D. 1990. Pogrbeniia muzhchin i detei v drevnikh mogil"nikakh Pribaikal'ia. Kratkie Soobshcheniya Instituta Arkheolgii an SSSR, 199, pp. 61-67.

Khoroshikh, P.P. 1924. Issledovaniia kamennogo i zheleznogo veka Irkutskogo kraia: (ostrov Ol'khon). Irkutsk. BGNII pri IGU 1(1).

Khoroshikh, P.P. 1948. Peshchery Baikala. *Priroda.* No. 12g. S. 50-58.

Khoroshikh, P.P. 1949. *Peshchery Zabaikala.* Tr. Kiakhtin. Kraev. Muze; i Kiakh.

Khoroshikh, P.P. 1950. *Po rodnomu kraiu.* Irkutsk: OGIZ.

Khoroshikh, P.P. 1952. *Po rodnomu kraiu.* Irkutsk.

Khoroshikh, P.P. 1955a. Nakhodki v peshcherakh ostrova Ol'khon. *Priroda.* No. 11. s. 110-112.

Khoroshikh, P.P. 1955b. *Po peshcheram Pribaikal'ia: ekskursii v peshchery Pribaikal'ia.* Irkutsk

Khoroshikh, P.P. 1955c. *Peshchery stoianki Sibiri kak istoricheskii istochnik*: Avtoref. Dis. Kand.ist. nauk. Irkutsk.

Khoroshikh, P.P. 1957. Eneoliticheskoe pogrebenie na beregu oz. Baikal. *SA* 4:153-155.

Khoroshikh, P.P. 1958. Peshchery Baikala. *Kraevedch. Sb. BGO* 3:29-36.

Khoroshikh, P.P. 1959. Sledy drevnego zemledeliq v Pribaikal'e. Sel'sk. *Khozhvo Sibiri* 7:87-88

Khoroshikh, P.P. 1960. Naskal'nye risunki na poberezh'e ozera Baikal. *Etnograf. Sb. Ulan-Ude* 1: 45-58.

Khoroshikh, P.P. 1962a. K voproso kul'ture bronzy na Baikale. *Kratkie Soobshch o n.-i. Rabotakh IGU za 1960 g*, 245-248. Irkutsk

Khoroshikh, P.P. 1962b. Naskal'nye risunki na gore Sakhiurte. *Kratkie soobshch. O n.-i. Rabotakh IGU za 1960 g*, pp. 204-207.

Khoroshikh, P.P. 1963. Sledy kurykanskoi kul'tury na Baikale. *Kratkie soobshch o n.-i. Rabotakh IGU za 1961 g.*, pp. 245-248. Irkutsk.

Komarova, M.N., and I.A. Sher. 1992. Mogil'niki bukhty Ulan-Khada. In Masson, V.M. (ed.), *Drevnosti Baikala*, pp.32-41. IGU, Irkutsk.

Konopatskii, A.K.1979. *Drevnie pamiatniki o. Ol'khona i Priol'khon'ia.* Ph.D. dissertation summary, AN SSSR, Novosibirsk.

Konopatskii, A.K. 1982. *Drevnie kul'tury Baikala: o. Ol'khon.* Novosibirsk: Nauka.

Konstantinov, G.M. 1928. Materials for the study of the Angara Neolithic. *Izvestiia* VSORGO 54:84-94.

Kozhov, M.M. 1950. Presnye vody Vostochnoi Sibiri (bassein Baikala, Angary, Vitima, verkhnego techenia Leny I Nizhnei Tunguski). Irkutskoe oblastnoe gosudarstvennoe izdatel'stvo, Irkutsk.

Kozhov, M.M. 1963. *Lake Baikal and its Life*. Dr. W. Junk Publishers. The Hague.

Kozhov, M.M. 1972. *Ocherki po baikalovedeniiu.* Vostochno-Sibirskoe knizhnoe izdatel'stvo.

Kuzmin, M.I., Williams, D.F., Logachev, N.A., Colman, S., Khakhaev, B.N., Kawai, T., Hearn, P., Horie, Sh., Pevzner, L.A., Bukharov, A.A., Fialkov, V.A. 1993. The Baikal Drilling Project: scientific objectives and recent results. *Russian Geology and Geophysics* 34 (10-11):3–11.

Kuzmin, M.I., Williams, D.F., Kawai, T. 2000. Baikal drilling project. In Minoura, K. (ed.), *Lake Baikal, a mirror in time and space for understanding global change processes*, p. 1–14. Elsevier Press, Amsterdam.

Lam, Y. M. 1993. Isotopic evidence for change in dietary patterns during the Baikal Neolithic. *Current Anthropology* 35:185-190.

Larsson, L. 2000. Dogs in fraction – symbols in action. In P.M. Vermeersch and P. Van Peer (eds.), *Contributions to the Mesolithic in Europe*, pp. 1530160. Leuven University Press, Leuven.

Lieverse, A.R. 2004. *Biological indicators of hunter-gatherer adaptation and cultural change in the Mid-Holocene Cis-Baikal,* Paper presented at the Conference on Hunter-Gatherer Coastal Adaptations, May 30–31, Aberdeen.

Lieverse, A.R. 2005. *Bioarchaeology of the Cis-Baikal: biological indicators of Mid-Holocene hunter-gatherer adaptation and culture change.* Ph.D. Dissertation. Cornell University, Ithaca.

Lieverse, A.R. n.d. Human osteological evidence: demography and health. In: A.W. Weber, M.A. Katzenberg , and O.I. Goriunova (editors), *Khuzhir-Nuge XIV Osteology: Data from a Late Neolithic / Early Bronze Age Cemetery in Cis-Baikal, Siberia (1997–2001 excavations).* Northern Hunter Gatherers: Research Series. Canadian Circumpolar Institute Press, Edmonton..

Link, D.W. 1996. *Hunter-gatherer demography and health in the Cis-Baikal Neolithic.* Ph.D. dissertation, University of Chicago.

Link, D.W. 1999. Boreal forest hunter-gatherer demography and health during the middle Holocene of the Cis-Baikal, Siberia. *Arctic Anthropology* 36:51–72.

Low, S.M. and D. Lawrence-Zuniga. *The anthropology of space and place (locating culture).* Blackwell, New York.

Lubbock, J. 1865. *Pre-historic Times, as illustrated by ancient remains, and the manners and customs of modern savages*. Williams and Norgate, London.

Mamonova, N.N. 1973. K voprosu o drevnem naselenii Priangar'ia po paleoantropologicheskim dannym. In *Problemy arkheologii Urala i Sibiri*, pp. 18-28. Nauka, Moscow.

Mamonova, N.N. 1980. Drevnee naselenie Angary i Leny v serovskoe vremia po dannym antropologii. In *Paleontropologia Sibiri*, pp. 64-88. Nauka, Moscow.

Mamonova, N.N. 1983. K voprosu o mezhgrupovykh razlichiiakh v neolite Pribaikal'ia. *Voprosy antropologii* 1:88-103.

Mamonova, N.N., and V.I. Bazaliiskii. 1991. Mogil'nik "Lokomotiv": Nekotorye biologicheskie i demograficheskie osobennosti naseleniia kitoiskoi kul'tury (po materialam raskopok 1980–1984 godov). In G.I. Medvedev (ed.) *Paleontologicheskie issledovaniia na iuge Srednei Sibiri*. IGU, Irkutsk

Mamonova, N.N., and L.D. Sulerzhitskii. 1986. Vozrast nekotorykh neoliticheskikh i eneoliticheskikh pogrebenii Pribaikal'ia po radiouglerodnym dannym. *Arkheologicheskie i etnograficheskie issledovaniia v Vostochnoi Sibiri*, Irkutskii gosudarstvennyi universitet, pp. 15-20. Irkutsk.

Mamonova, N.N., and L.D. Sulerzhitskii. 1989. Opyt datirovaniia po C14 pogrebenii Pribaikal'ia epokhi golotsena. *Sovetskaia arkheologiia* 1:19-32.

McGuire, R.H. 1992. *A Marxist archaeology*. Academic Press, San Diego.

Miller, M.O. 1956. *Archaeology in the USSR.* Atlantic Press, London.

Medvedev, G. I. (1969). Archaeological investigations of the stratified Paleolithic site of Krasnyi Iar on the Angara in 1964-65. *Arctic Anthropology* 6(1): 30-44.

Metcalf, M. n.d. *Mortuary variability at Kurma XI.* M.A. thesis, University of Alberta, Edmonton.

Metcalf, P., and R. Huntington. 1991. *Celebrations of death: the anthropology of mortuary ritual.* Cambridge University Press. New York.

Michael, H.N. 1958. The Neolithic Age in Eastern Siberia. *Transactions, New Series* 48(2). American Philosophical Society, Philadelphia.

Michael, H. N. 1992a. The Neolithic cultures of Siberia and the Soviet Far East. In Ehrich ,W. (ed.), *Chronologies in Old World Archaeology, (Vol. 1),* pp. 416-429. Chicago University Press, Chicago,

Michael, H. N. 1992b. Siberia and the Soviet Far East. In Ehrich, W. (ed.), *Chronologies in Old World Archaeology, (Vol. 2),* pp. 405-417. Chicago University Press, Chicago,

Mongait, A.L. 1961 [1955]. *Archaeology in the USSR.* Pelican Books, Harmandsworth.

Mooder, K.P., T.G. Schurr, F.J. Bamforth, and V.I. Bazaliiski. 2003. Mitochondrial DNA and archaeology: the genetic characterization of prehistoric Siberian hunter-gatherers. In: A.W. Weber and H.G. McKenzie (eds.), *Prehistoric Foragers of the Cis-Baikal, Siberia,* pp. 193-202. Canadian Circumpolar Institute Press. Edmonton.

Mooder, K.P., T.G. Schurr, F.J. Bamforth, V.I. Bazaliiski, and N.A. Savel'ev. n.d. a. population affinities of Neolithic Siberians: a snapshot from prehistoric Lake Baikal. *American Journal of Physical Anthropology* (in press).

Mooder, K.P., A.W. Weber, T.G. Schurr, F.J. Bamforth, V.I. Bazaliiski, and N.A. Savel'ev. 2005. Matrilineal affinities and prehistoric Siberian mortuary practices: a case study from Neolithic Lake Baikal. *Journal of Archaeological Science* 4:619-634.

Morris, I. 1991. The archaeology of ancestors: the Saxe/Goldstein hypothesis revisited. *Cambridge Archaeological Journal* 1(2): 147-169.

Okladnikov, A.P. 1938. Arkheologicheskie dannye o drevneishei istorii Pribaikal'ia. *Vestnik drevnei istorii* 1/2.

Okladnikov, A.P. 1950. *Neolit i bronzovyi vek Pribaikal'ia.* Part 1 & 2. Materialy i Issledovaniia po Arkheologii SSSR 18. Nauka, Moscow.

Okladnikov, A.P. 1955. *Neolit i bronzovyi vek Pribaikal'ia.* Part 3. Materialy i Issledovaniia po Arkheologii SSSR 43. Nauka, Moscow.

Okladnikov, A.P. 1956. Arkheologicheskie issledovaniia v doline r. Angary I na Dal'nem Vostoke v 1955 f. Tez. Dok. Na sessii Otd-niia ist. Nauk I plenume IIMK, posviashch. Itogam arkheol. *Issled.* 1955 g. M.; L., 46-48.

Okladnikov, A.P. 1958. Arkheologicheskie raboty v zone stroitel'stva angarskikh gidroelektrostantsii: (obshchie itogi). *Zap. Irkut. Obl. Kraev. Muzeia*: 17-28.

Okladnikov, A. P. 1959. Ancient Populations of Siberia and Its Cultures. *Russian Translations of the Peabody Museum of Archaeology and Ethnology,* 1(1). Harvard University.

Okladnikov, A.P. 1964. Ancient Populations of Siberia and its Culture. In: M.G. Levin, and L.P. Potapov (eds.), *The Peoples of Siberia*, pp. 13- 98. Chicago University Press, Chicago.

Okladnikov, A. P. 1971. Ancient Populations of Siberia and Its Cultures. *Russian Translations of the Peabody Museum of Archaeology and Ethnology,* 1(1). Harvard University. Reprinted

Okladnikov, A. P. 1971. *Arkheologicheskie issledovaniia v verkhov'iakh r. Leny v 1971* LOIA USSR Academy of Sciences, Leningrad, (Field report No. R-1, 4485).

Okladnikov, A. P. 1974. *Neoliticheskie pamiatniki Angary (ot Shchukino do Bureti.* Nauka, Novosibirsk.

Okladnikov, A. P. 1975. *Neoliticheskie pamiatniki Srednei Angary (ot ust'ia r. Beloi do Ust'-Udy).* Nauka, Novosibirsk.

Okladnikov, A.P. 1976. *Neoliticheskie pamiatniki Nizhnei Angary (ot Serovo do Bratska).* Nauka, Novosibirsk.

Okladnikov, A.P. 1978. Verkholenskii mogil'nik: Pamiatnik drevnei kul'tury narodov Sibiri, Nauka, Novosibirsk.

Okladnikov, A.P., and A.K. Konopatskii. 1975. Hunters for seal on the Baikal Lake in the Stone and Bronze Ages. *Folk* 16-17:299-308.

O'Shea, J. 1984. *Mortuary variability: an archaeological investigation.* Academic Press, Orlando.

Ovchinnikov, M.P. 1904. Materials for the study of the antiquities in the environs of Irkutsk. *Izvestiia* VSORGO 35(3):62-76.

Ovodov, N.D., O.I. Goriunova, and A.W. Weber. n.d. Kostnye ostatki zhivotnykh iz pogrebenii mogil'nika Bronzovogo veka Khuzhir-Nuge XIV (oz. Baikal). In, A.W. Weber and O.I. Goriunova (eds.) *Khuzhir-Nuge XIV Monograph.* Northern Hunter Gatherers: Research Series Volume 2. Canadian Circumpolar Institute Press, Edmonton (forthcoming).

Parker Pearson, M. 1982. Mortuary practices, society and ideology: an ethnoarchaeological study. In: I. Hodder (ed.), *Symbolic and Structural Archaeology*, pp. 99-113. Cambridge University Press, Cambridge.

Parker Pearson, M. 1993. The powerful dead: archaeological relationships between the living and the dead. *Cambridge Archaeological Journal* 3(2): 203-229.

Pastukhov, V.D. 1993. *Nerpa Baikala.* Nauka, Novosibirsk.

Petri, B.E. 1914. Vtoraia poezdka v Predbaikal'e. Izv. Rus. Kom. Dlia izuch. Sred. I Vost. Azii. 2(3):89-106.

Petri, B.E. 1916a. Neoliticheskie naxodki na beregu Baikala: Predvarit. Soobshch. O raskopke stoianki "Ulan-Khada". Sb, MAE :113-132.

Petri, B.E. 1916b. Otchet B.E. Petri o komandirovke na Baikal dlia arkheologicheskikh razvedok: otchet o deiatel'nosti AN op otd. Fiziko-matem. Nauk I ist. Nauk I filologii za 1916 g. SPb.

Petri, B.E. 1921. Neoliticheskaia koloniia v bukhte "Peschanaia" na Baikale. Sb tr. IGU 1(2):56-65.

Petri, B.E. 1923a. Doistoricheskie kuznetsy v Pribaikal'e: (k vopr. o doist. proshlom iakutov). *Nauka I shk. Chita* 1:21-29.

Petri, B.E. 1923b. Sibirskii paleolit. Sb. Tr. IGU 5: Nauki gum:209-253.

Petri, B.E. 1928. Podgorbunskii V.I. Zametki po izucheniiu goncharstva iakutov. *Sib Zhvaia Starina* 7:127-144.

Pruitt, Jr., W.O. 1978. *Boreal Ecology*. Edward Arnold. London.

Rakita, G.F.M., J.E. Buikstra, L.A Beck, and S.R Williams (eds.). 2005. *Interacting with the dead: perspectives on mortuary archaeology for the new millennium.* University Press of Florida, Gainesville.

Rakita G.F.M and J.E. Buikstra. 2005. Introduction. In: G.F.M. Rakita, J.E. Buikstra, L.A Beck, and S.R Williams (eds.), *Interacting with the dead: perspectives on mortuary archaeology for the new millennium*, pp. 1-11. University Press of Florida, Gainesville.

Robertson, C.J. n.d. *Grave disturbance at Khuzhir-Nuge XIV.* M.A. thesis, University of Alberta, Edmonton.

Sackett, J.R. 1977. The meaning of style in archaeology: A general model. *American Antiquity* 42:369–80.

Savel'ev, N.A. 1989. *Neolit iuga srednei Sibiri: istoria osnovnykh idei i sovremennoe sostoianie problemy*. Ph.D. dissertation summary. AN SSSR, Novosibirsk.

Savel'ev, N A. 1991. Vklad B. E. Petri v izuchenie sibirskogo neolita In: G.I. Medvedev (ed.), *Paleontologicheskie issledovaniia na iuge srednei Sibiri*, pp. 75-93. IGU, Irkutsk.

Savel'ev, N.A. and V.V. Svinin. 1994. *Professor B.E. Petri: u istokov Irkutskoi arkheologicheskoi shkoly.*

Savel'ev, N.A., and Medvedev, G. I. 1973. Rannii keramicheskii kompleks mnogosloinogo poseleniia Ust'-Belaia. In *Problemy arkheologii Urala i Sibiri*, pp. 56-64. Nauka, Moscow,

Saxe, A. 1970. *Social dimensions of mortuary practices*. Ph.D dissertation. Department of Anthropology, University of Michigan. Ann Arbor.

Schulting, R.J. 1998. *Mortuary variability and status differentiation on the Columbia-Fraser plateau.* Archaeology Press, Burnaby.

Schurr, T.G. 2003. Molecular genetic diversity of indigenous Siberians: implications for ancient DNA studies of Cis-Baikal archeological populations. In: A. Weber and H. McKenzie (eds.), *Prehistoric Foragers of the Cis-Baikal, Siberia*, pp. 156-186. Canadian Circumpolar Institute Press. Edmonton.

Schwartz, M. 1997. *A history of dogs in the early Americas.* Yale University Press, New Haven.

Sekerin, N.V., and N.V Sekerina. 2000. Nefrity i ikh rasprostranenie v iuzhnoi sibiri. *Baikal'skaia Sibir' v drevnosti* 2:146–60.

Shahgedanova, M. and Goudie, A. (eds.). 2002. *The physical geography of northern Eurasia: Russia and neighboring states.* Oxford University Press, Oxford.

Shanks, M. and C. Tilley. 1982. Ideology, symbolic power and ritual communication: a reinterpretation of Neolithic mortuary practices. In: I. Hodder (ed.), *Symbolic and Structural Archaeology.* Cambridge University Press, Cambridge.

Silverman, H. and D.B. Small (eds.). 2002. *The space and place of death.* Archaeological Papers of the American Anthropological Association, No. 11. Arlington.

Sinitsyna, G. V. 1986. *Neoliticheskie pamiatniki Verkhnei Angary (na materialakh poselenii).* AN SSSR. Leningrad.

Soffer, O. 1983. Politics of the Paleolithic in the USSR: A Case of Paradigms Lost. In: J.M. Gero, D.M. Lacy, and M.L Blakey (eds.), *The Socio-Politics of Archaeology*, pp. 91-106. Research Report 23. Department of Anthropology, University of Massachusetts.

Sosnovskaia, N.C. 1996. Issledovanie mogil'nika Kurma XI (poberezj'e Malogo Moria ozera Baikal). *Arkheologiia, paleoekologiia I etnologiia Sibiri I Dal'nego Vostoka.* 2:47-49. IGU, Irkutsk.

Smith, S.L. 2001. Permafrost zones of Eurasia. Geological survey of Canada.

Staniklovskii, A.M. 1902. Zapiski. VSORGO 7.:1-191.

Strahlenberg, F.J. 1730. *Das Nord- und ostlich theil von Europa und Asia.* Stockholm.

Sugiyama, S. 1989. Burials dedicated to the Old Temple of Quetzalcóatl at Teotihuacan, Mexico. *American Antiquity* 54(1): 85-106.

Svinin, V.V. 1956a. Arkheologicheskie issledovaniia v Ol'khonskom raione. Po zavetam lenina. Elantsy.

Svinin, V.V. 1956b. Kularinskaia peshchera. *Vost.Sib. Pravda.*

Svinin, V.V. 1958. U istokov drevneishei zemledel'chesko; kul'tury Pribaikal'ia. *Znamia Lenina.* Ust'-Orda.

Svinin, V.V. 1966, Arkheologicheskie issledovaniia na severnom opberezh'e ozera Baikal v 1963-1965 gg. *Otchety arkheologicheskikh ekspeditsii za 1963-1955 gg.: (Materialy k dokl. Na nauch sessii In-ta arkheologii AN SSSR)*, pp. 50-69. Irkutsk

Svinin, V.V. 1970. *Arkheologiia ozera Baikal.* Ph.D. dissertation summary. AN SSSR, Novosibirsk.

Svinin, V.V. 1971. Tyrganskii mogil'nik. Uchen.zap. *VSORGO SSSR; Irkut, obl, musei kraevedeniia* 4(1): 140-144.

Svinin, V.V. 1974. Osnovnye etapy drevnei istorii naseleniia poberezh'ia oz. Baikal *Drevniaia istoriia narodov iuga Vostochnoi Sibiri,* pp. 7-24. IGU, Irkutsk.

Svinin, V.V (ed.). 1981. *Bronzovyi vek Priangar'ia: Mogil'nik Shumilikha.* Nauka, Irkutsk.

Svinin, V.V. 1992. Arkheologicheskie pamiatniki Baikala I ix issledovateli. In V.M. Masson (ed.), *Drevnosti Baikala,* pp. 111-132. Izd-vo IGU, Irkutsk.

Svinin, V.V. and M.A. Zaitsev 1982. K voprosu o tak nazyvaemyx "shatrovyx mogilax". *Problemy arkheologii I perspektivy izucheniia drevnikh kul'tur Sibiri I Dal'nego Vostoka. Tez dokl.,* pp. 138-140. Iakutsk

Svinin V.V., M.A. Zaitsev, A.V. Kharinskii and I.I Iushchenko. 1986. *Arkheologicheskie issledovaniia ritual'nyx kompleksov zheleznogo veka na severo-zapadnom poberezj'e Baikala. Arkheologicheskie I etnograficheskie issledovaniia v Vostochnoi Sibiri: (itogi I perspectivy): Tez. Dokl. K region. Konf,* pp. 123-126. Irkutsk.

Tainter, J.R. 1978. Mortuary practices and the study of prehistoric systems. In: M.B. Schiffer (ed.), *Advances in Archaeological Method and Theory,* vol. 1, pp. 105-141. Academic Press, New York.

Taylor, R.E. 1997. *Radiocarbon dating: An archaeological perspective.* Academic Press, San Diego.

Tilley, C. 1994. *A phenomenology of landscape: places, paths, and monuments.* Berg, Oxford.

Tilley, C. 2004. *The materiality of stone: explorations in landscape phenomenology.* Berg, Oxford.

Titov, E.I. 1926. Neoliticheskaiia stoianka na krainem severe Baikala. VSORGO 51:163-165.

Tolstikhina, O.I. 1924. Diunnaiia stoianka u sela Tvorogovo-Shigaeva. *Sib. Zhivaia starina* 2:133-134.

Tolstoi, P. 1958. The Archaeology of the Lena Basin and its New World Relationships. *American Antiquity* 23:397-418.

Trigger, B.A. 1989. *A history of archaeological thought.* Cambridge University Press, Cambridge.

Turkin, G.V., and A.V. Kharinskii. 2004. Mogil'niki Shamanka II: K voprosu o khronologii i kul'turnoi prinadlezhnosti pogrebal'nykh kompleksov Neolita-Bronzovogo veka na Iuzhnom Baikale. *Izvestiia Laboratorii Drevnikh Tekhnologii* 2:124–58.

Ucko, P. 1969. Ethnography and archaeological interpretation of funerary remains. *World Archaeology* 1(2):262-280.

van Gennep, A. 1960. *The rites of passage.* University of Chicago Press. Chicago.

van Klinken, G.J. 1999. Bone collagen quality indicators for palaeodietary and radiocarbon measurements. *Journal of Archaeological Science.* 26:687–695.

Vasil'evskii, R. S. (ed.). 1978. *Drevnie kul'tury Priangar'ia,* Nauka, Novisibirsk.

Vasil'evskii, R. S. 1981. Kratkii ocherk nauchnoi, pedagogicheskoi i nauchno-organizatsionnoi deiatel'nosti. In: *Aleksei Pavlovich Okladnikov,* pp. 9-34. Nauka, Moscow.

Veksler, V.S., and B.D. Putans. 1974. Opredelenie absolutnogo vozrasta po C-14 obraztsov mnogosloinoi stoianki Gorelyi Les. In *Drevniaia istoriia narodov Vostochnoi Sibiri* 1: 200-201. IGU, Irkutsk.

Vitkovskii, N. I. 1880. Kratkii otchet o raskopke mogily kamennogo perioda w Irkutskoi gub. *Izvestia VSORGO* XI(3-4): 1-12.

Vitkovskii, N. I. 1881. O rezul'tatakh raskopok drevnikh mogil, prinadlezhashchikh kamennomu veku. *Izvestia VSORGO* XII(1).

Vitkovskii, N. I. 1882. Otchet o raskopkakh mogil kamennogo veka v Irkutskoi gub., na levom beregu Angary, proizvedennykh letom 1881 g. (s kartoiu i tremia tablitsami risunkov). *Izvestia VSORGO* XIII(1-2): 1-36.

Vitkovskii, N. I. 1889. Sledy kamennogo veka v doline r. Angary. *Izvestia VSORGO* XX: 1-42.

Volkov, B.B. 1975. Graves at Norovlin Uula (Mongolia). *Arkheologiia Severnoi i Tsentral'noi Azee,* p. 76–79. Nauka, Novosibirsk.

Ward, G.K., and S.R. Wilson. 1978. Procedures for comparing and combining radiocarbon age determinations: a critique. *Archaeometry* 20:19-31.

Weber, A. 1994. Social evolution among Neolithic and Early Bronze Age foragers in the Lake Baikal region: New light on old models. *Arctic Anthropology* 31(2): 1–15.

Weber, A. 1995. The Neolithic and Early Bronze Age of the Lake Baikal region, Siberia: A review of recent research. *Journal of World Prehistory* 9:99–165.

Weber, A.W. 1997. *Excavations of the Gorelyi Les site (Siberia) in 1994-1996: a field work report*. Department of Anthropology, University of Alberta, Edmonton.

Weber, A. 2001. Middle Holocene hunter-gatherers of Cis-Baikal, Siberia. Research Grant Proposal to the Major Collaborative Research Initiatives Program of the Social Sciences and Humanities Research Council of Canada.

Weber, A.W. 2003. Bio-geographic profile of the Lake Baikal region. In: A.W. Weber and H.G. M^{c}Kenzie (eds.), *Prehistoric foragers of the Cis-Baikal, Siberia,* p. 53–76. Canadian Circumpolar Institute Press, University of Alberta.

Weber, AW. 2004a. The origins of the Kitoi culture: Middle Holocene fishing and culture formation processes at Cis-Baikal. Paper presented at the *Conference on Hunter-Gatherer Coastal Adaptations*, May 30–31, 2004, Aberdeen.

Weber, AW. 2004b. Cis-Baikal culture history: model evaluation five years after. Paper presented at the *Baikal Archaeology Project Annual Workshop*, May 28–29, 2004, Aberdeen.

Weber, A. 2005. Middle Holocene hunter-gatherers of Cis-Baikal, Siberia. Research Grant Proposal to the Major Collaborative Research Initiatives Program of the Social Sciences and Humanities Research Council of Canada.

Weber, A.W. and V.I. Baziliiskii. 1996. Mortuary practices and social relations of the Neolithic foragers of the Angara and Lake Baikal region: retrospection and prospection. In: D.A. Meyer, P.C. Dawson, and D.T. Hanna (eds.), *Debating Complexity: Proceedings of the Twenty-sixth Annual Chacmool Conference*, pp. 97-103. University of Calgary Archaeological Association. Calgary.

Weber, A.W. and O.I. Goriunova. 2005. Khronologiia mogil'nika Kurma XI (ozero Baikal) po arkheologicheskim I radiouglerodnym dannym. *Izvestiia Laboratorii drevnikh tekhnologii* 3:186-190.

Weber, A.W. and O.I. Goriunova. n.d. Fieldwork methods at Khuzhir-Nuge XIV. In, A.W. Weber and O.I. Goriunova (eds.) K*huzhir-Nuge XIV Monograph.* Northern Hunter Gatherers: Research Series Volume 2. Canadian Circumpolar Institute Press, Edmonton. (forthcoming).

Weber, A.W. and O.I. Goriunova (editors) n.d. *Khuzhir-Nuge XIV Monograph.* Northern Hunter Gatherers: Research Series Volume 2. Canadian Circumpolar Institute Press, Edmonton. (forthcoming).

Weber, A.W. and A.M. Katzenberg. 1998. New Evidence for Subsistence Change in the Cis-Baikal Neolithic and Early Bronze Age. In: *Sibir' v panorame tysiachiletii*, ed. V.I. Molodin, proceedings of the symposium in honour of Academician A.P. Okladnikov, vol. 1: 124-130. Novosibirsk: Russian Academy of Sciences.

Weber, A, and H. McKenzie (eds.). 2003. *Prehistoric Foragers of the Cis-Baikal, Siberia.* Canadian Circumpolar Institute Press. Edmonton.

Weber, A., A.K. Konopatskii and O.I. Goriunova. 1993. Prehistoric seal hunting on Lake Baikal: methodology and preliminary results of the analysis of canine sections. *Journal of Archaeological Science* 20:629-644.

Weber, A., D.W. Link, O.I. Goriunva, A.K. Konopatskii. 1998. Patterns of prehistoric procurement of seal at Lake Baikal: A zooarchaeological contribution to the study of past foraging economies in Siberia. *Journal of Archaeological Science*, Vol. 25: 215–227.

Weber, A.W., R.A. Creaser, and O.I. Goriunova. 2003. Strontium isotope tracers in enamel of permanent human molars provide new insights into prehistoric hunter-gatherer procurement and mobility patterns: a pilot study of a Middle Holocene group from Cis-Baikal. In: A. Weber and H. McKenzie (eds.), *Prehistoric Foragers of the Cis-Baikal, Siberia*, pp. 133-154. Canadian Circumpolar Institute Press. Edmonton.

Weber, A.W., H.G. McKenzie, R. Beukens, and O.I. Goriunova. 2005. Evaluation of radiocarbon dates from the Middle Holocene hunter-gatherer cemetery Khuzhir-Nuge XIV, Lake Baikal, Siberia. *Journal of Archaeological Science* 32:1481-1500.

Weber, A.W., H.G. McKenzie, R. Beukens. n.d. Chronology of the Neolithic-Bronze Age cemetery Khuzhir-Nuge XIV on Lake Baikal. In, A.W. Weber and O.I. Goriunova (eds.) K*huzhir-Nuge XIV Monograph.* Northern Hunter Gatherers: Research Series Volume 2. Canadian Circumpolar Institute Press, Edmonton. (forthcoming).

Weber, A.W., Creaser, R.A., Goriunova, O.I. and C.M. Haverkort. 2003. Strontium isotope tracers in enamel of permanent human molars provide new insights into prehistoric hunter-gatherer procurement and mobility patterns: a pilot study of a middle Holocene group from Cis-Baikal, In: A. Weber and H. M^c^Kenzie (eds.) *Prehistoric Foragers of the Cis-Baikal, Siberia*, pp.133–153. Canadian Circumpolar Institute Press, Edmonton.

Weitzel, M.A. 2005. *Human Taphonomy: Khuzhir-Nuge XIV, Siberia and Edmonton,* Alberta. PhD dissertation, University of Alberta.

Weitzel, M.A. n.d. The mortuary use of fire at Khuzhir-Nuge XIV. In AW. Weber, M.A. Katzenberg , and O.I. Goriunova (editors), *Khuzhir-Nuge XIV Osteology: Data from a Late Neolithic / Early Bronze Age Cemetery in Cis-Baikal, Siberia (1997–2001 excavations).* Northern Hunter-Gatherers Research Series. Edmonton, AB: CCI Press (forthcoming).

Weitzel, M.A. and A.W. Weber n.d. The mortuary use of ochre. In AW. Weber, M.A. Katzenberg , and O.I. Goriunova (editors), *Khuzhir-Nuge XIV Osteology: Data from a Late Neolithic / Early Bronze Age Cemetery in Cis-Baikal, Siberia (1997–2001 excavations).* Northern Hunter-Gatherers Research Series. Edmonton, AB: CCI Press (forthcoming).

White, D.S. n.d. *Holocene climate and culture change in the Lake Baikal Region, Siberia.* Unpublished Ph.D. dissertation. University of Alberta, Edmonton.

Williams, D.F., Kuzmin, M.I., Prokopenko, A.A., Karabanov, E.B., Khursevich, G.K., Bezrukova, E.V. 2001. The Lake Baikal drilling project in the context of a global lake drilling initiative. *Quaternary International*, 80/81:3–18.

Ziablin, L.P. 1959. *Mogil'nik Uliarba.* Akademia nauk SSSR (Leningradskii otdel Instituta arkheologii 1-202). Leningrad.

Zaitseva O.V. 1996. Kul't golovy u narodov Zapadnoi Sibiri. *Arkheologiia, Paleoekologiia I Etnologiia Sibiri I Dal'nego Vostoka: tezisy dokladov rask XXXVI Chast 2*, pp. 7-9. IGU, Irkutsk.

Zubkov, V.S. 1982. *Neolit i rannii bronzovyi vek Verkhnei Leny.* Ph.D. dissertation summary, A.A. Zhdanov State University, Leningrad.

Abbreviations used in Russian Citations

AGU	Altai State University
AN SSSR	Academy of Science USSR
BGNII	Biological-Geographical Scientific Research Institute IGU.
BKAE	Baikal Comprehensive Archaeological Expedition
BNTS SO RAN	Buriat Research Centre SO RAN
BF S AN SSSR	Buriat Department SO AN SSSR
VSOGO SSSR	Eastern-Siberian Division of the Geographical Society USSR
VSORGO	Eastern-Siberian Division of the Russian Geographical Society.
IA AN SSSR	Institute of Archaeology of the Academy of Science USSR
IAEt SO RAN	Institute of Archaeology and Ethnography SO RAN
IGPU	Irkutsk State Pedagogical University
IGU	Irkutsk State University
IGTU	Irkutsk State Technical University
Izv. SO AN SSSR	News of the Siberian Division of the Academy of Science USSR
IIMK	Institute of the History of Material Culture RAN
ION BNTS SO RAN	Institute of Social Sciences of Buriat Research Center SO RAN
KAE	Comprehensive Archaeological Expedition IGU
KSIA	Brief Reports of the Institute of Archaeology
KSIIMK	Brief reports of the Institute of the History of Material Culture
LOIA AN SSSR	Leningrad Division of the Institute of Archaeology AN SSSR
MIA	Materials and Research in Archaeology
SO AN SSSR	Siberian Division of AN SSSR
SO RAN	Siberian Division of the Russian Academy of Science
TGU	Tomsk State University
CHGPI	Chita State N.G. Chernyshevskii Pedagogical Institute
IGOM	Irkutsk State Regional Museum
Izv. VSORGO	News of the Eastern-Siberian Division of the Russian Geographical Society
IIFF	Institute of History, Philology and Philosophy SO AN SSSR (SO RAN)
MAE	Museum of Anthropology and Ethnography AN SSSR (RAN)
RAN	Russian Academy of Science
RASK	Regional Archaeological Student Conference
SA	Soviet Archaeology