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Mortuary Variation at the Early Neolithic Hunter-Gatherer Cemetery Shamanka II on Lake Baikal

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НИЦ «Байкальский регион»

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Под редакцией
A. W. Weber

Weber A. W.
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В этой версии монографии о могильнике Шаманка II основное внимание уделяется хронологии, паттернам рациона питания и разнообразию погребального обряда китойской культуры. Глава 1 дает основную археологическую информацию, относящуюся к аналитическим главам, рассматривает историю полевых работ на Шаманке II и описывает методы раскопок. В главе 2 исследуется хронология могильника, история его использования, а также рацион питания – все это на основе обширных данных радиоуглеродного датирования и стабильного изотопного анализа. В главе 3 представлен подход к изучению вариаций в погребальном обряде. Результаты этого исследования (включая хронологию и планиграфию могильника; положение, ориентацию и целостность скелетных останков; проявления погребальных обрядов после захоронения; распределение погребального инвентаря) представлены в главах 4–6. Останки фауны, зафиксированные в могилах, рассматриваются в главе 7. Глава 8 – резюме этих исследований и оценка результатов с точки зрения более полного знания истории китойского культурного паттерна в Предбайкалье. В заключении даются дополнительные комментарии относительно общего археологического значения могильника Шаманка II и предлагается несколько идей для будущих исследований. В приложении обобщены все результаты радиоуглеродного и стабильного изотопного анализа, полученные для захоронения № 42.02.

Книга будет интересна широкому кругу читателей – ученым и студентам, занимающимся археологией голоценовых охотников-собирателей Сибири, Северной Евразии и даже за ее пределами. Монография предоставляет множество данных для сравнительного изучения с такими «классическими» и широко известными могильниками, как Олений Остров в Карелии, Звейниеки в Латвии, Скатехольм и Ведбек в Южной Скандинавии, а также Тевье и Хоэдик в Бретани. Книгу можно использовать в качестве учебника для университетских занятий по археологии погребальных комплексов охотников-собирателей, включая методы раскопок, сбор данных и подходы к анализу данных.

Keywords: китойская культура, охотники-рыболовы, Предбайкалье, Восточная Сибирь, неолит, голоцен, погребальный обряд, хронология, рацион питания, погребальный инвентарь.

In this version of the monograph on the Shamanka II cemetery the focus is on chronology, dietary patterns, and variation in Kitoi mortuary practices. Chapter 1 gives background archeological information relevant to the analytical chapters, reviews the history of fieldwork at Shamanka II, and presents excavation methods. Chapter 2 explores cemetery chronology, its history of use, and dietary patterns based on extensive radiocarbon and stable isotope data. Chapter 3 presents the approach to the examination of variation in mortuary practices. Results of this examination (including the chronology and spatial organization of mortuary features; the position, orientation and integrity of skeletal remains; manifestations of post-disposal mortuary activities as well as the distribution of grave goods) are presented in Chapters 4–6. The faunal remains recovered from the graves are examined in Chapter 7. Chapter 8 is a summary of these studies and assesses how the findings contribute to a more complete knowledge about the history of the Kitoi cultural pattern in Cis-Baikal. The Conclusion provides additional comments about the general archaeological importance of the Shamanka II cemetery and offers a few ideas for future research. The Addendum summarizes all radiocarbon and stable isotope results obtained for Burial 42.02.

The book will be of interest to broad readership — scholars and students — engaged in Holocene hunter-gatherer prehistory of Siberia, northern Eurasia, and even beyond. It provides wealth of data for comparative examination with such “classic” and well-known cemeteries as Olenii Ostrov in Karelia, Zvejnieki in Latvia, Skateholm and Vedbæk in southern Scandinavia, and Téviec and Hoëdic in Britanny. The book can be used as a textbook for university classes on hunter-gather mortuary archaeology including excavation techniques, data collection and approaches to data analysis.

Keywords: Kitoi culture, hunter-gatherers, Cis-Baikal, Eastern Siberia, Neolithic, Holocene, mortuary practices, chronology, dietary patterns, grave goods.

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Introduction

Andrzej W. Weber, Vladimir I. Bazaliiskii, Erin Jessup

The Baikal Archaeology Project (BAP) comprises an international and multidisciplinary team of scholars studying Middle Holocene hunter–gatherers in the Cis-Baikal region of Siberia, Russia. The two main partners in this long-term collaborative research are the University of Alberta in Edmonton, Canada, and Irkutsk State University in Russia. To date, five monographs dedicated to the materials excavated by the BAP have been published in the West in English (Losey and Nomokonova, 2017; Weber et al., 2007; Weber et al., 2008; Weber et al., 2012; Weber et al., 2024a) and three more in Russia in Russian (Goriunova et al., 2012; Novikov et al., 2010; Novikov et al., 2023). Of these eight, the recent publication of the Early Neolithic component of the Shamanka II cemetery on SW Baikal, is by far the most comprehensive. The monograph, published by the German Archaeological Institute (henceforth the GAI monograph), consists of two printed volumes and several digital supplements:

- Volume 1 (574 pages) presents introductory information, fieldwork history and methods employed at Shamanka II, site stratigraphy and description of the cultural layer, as well as detailed accounts of excavated archaeological materials and human osteological remains, all compiled into five chapters. Moreover, Volume 1 includes several analytical chapters which cover such topics as demography, health and activity patterns; faunal remains recovered from the graves; cemetery chronology, history of use, and diet of the Shamanka II population; variation in mortuary rituals (four chapters); and two chapters summarizing the entire monograph;
- Volume 2 (537 pages) consists of three printed supplements: 461 full-page plates showing site and area maps, grave floor plans, cross-sections, and grave goods; tables with mineralogical determinations of lithic grave goods; and radiocarbon and stable isotope data for the chapter on chronology and diet.
- The digital supplements (Volume 3) repeat some of the printed appendices (i.e., radiocarbon, stable isotope, and mineralogical data) and, moreover, provide studio photos of grave goods (~2700), in situ photos (~600) of excavated graves, and tables with data compiled for the chapters dedicated to the analysis of mortuary ritual.

The entire GAI monograph is available online and can be downloaded through the following link: https://doi.org/10.34780/8htf-6bf3. Alternatively, these materials can be obtained by contacting A.W. Weber (aweber@ualberta.ca) or E. Jessup (ejessup@ualberta.ca) directly.

Because of the very large total volume of the GAI monograph (1111 printed pages), we are concerned that it may not be as widely and easily accessible to the interested readership within Russia as one would have liked it. Therefore, the BAP has approached

Irkutsk State University to publish a short version of the GAI monograph. This short version (henceforth the ISU monograph) focuses on chronology, dietary patterns, and variation in mortuary practices and repeats the relevant chapters of the GAI monograph. However, this material is organized somewhat differently in that chapters on variation in mortuary practices have been split into smaller studies preceded by a separate chapter dedicated to the approach and the chapter on faunal remains has been substantially expanded. Also, since the size of the GAI monograph could be perceived as somewhat overwhelming, the more focused ISU version will probably attract more attention and be more practical to all readers: Russian and Western alike.

The BAP will close its operations in 2026 and resources for professional translation of these studies into Russian are either quickly disappearing (i.e., funding and time) or lacking and difficult to secure (i.e., linguistic expertise). Consequently, the ISU monograph is published entirely in English believing that it will still be of considerable use and interest to the Russian archaeological community. Preparation of a Russian edition of the Early Neolithic materials from Shamanka II is still in progress and should appear in press in the near future. The main focus of the Russian edition will be on descriptive presentation of all Early Neolithic materials thus complementing the analytical work presented in the English language monographs published by the GAI and ISU.

In Chapter 1 of this ISU monograph, V.I. Bazaliiskii, A.W. Weber, and E. Jessup give background archeological information relevant to all chapters, review the history of fieldwork at Shamanka II, and explain the methods employed when the site was systematically excavated by the BAP. In Chapter 2, A.W. Weber uses the extensive set of radiocarbon and stable isotope data generated for Shamanka II to explore cemetery chronology, its history of use, and dietary patterns. Chapter 3 presents the approach to the examination of variation in mortuary practices at Shamanka II. Results of this examination, including the chronology and spatial organization of mortuary features; the position, orientation and integrity of skeletal remains; manifestations of post-disposal mortuary activities (e.g., secondary burials, the use of fire, and the addition or removal of skeletal remains); as well as the distribution of grave goods are presented in Chapters 4–6. All four of these chapters are authored by the same team: A.W. Weber, V.I. Bazaliiskii, and E. Jessup. The faunal remains recovered from the graves are examined by A.W. Weber and colleagues in Chapter 7. In Chapter 8, A.W. Weber attempts to summarize all these studies and assess how the findings contribute to a more complete knowledge about the history of the Kitoi cultural pattern in Cis-Baikal. The Conclusion provides additional comments about the general archaeological importance of the Shamanka II cemetery and offers a few ideas for future research. The Addendum presents additional radiocarbon and stable isotope results for Burial 42.02, which arrived too late to be incorporated into the monograph, and explains how the new data affect the sorting of this individual into various units of analysis.

Most graves referenced in the chapters are illustrated in photos or drawings of floor plans, cross and longitudinal sections, and grave goods placed within relevant chapters. The complete set of this illustrative material is available through the online links to the GAI monograph.

The supplements to the ISU monograph provide additional empirical information in the form of tables with various datasets to make them more accessible for future analyses. Supplementary Table S.1 is a summary of all archaeological features excavated at Shamanka II, primarily by the BAP. Tables S.2 and S.3 contain the radiocarbon and stable isotope data analyzed in Chapter 2, while Table S.4 includes faunal data examined in

Chapter 7. Tables S.1–S.3 are printed at the end of the ISU monograph and Table S.4, which is too large to be printed, is available only in digital format and can be obtained via download, along with the rest of the ISU monograph, at https://doi.org/10.7939/r3-4dr2-2a56 or by contacting E. Jessup or A.W. Weber by email.

For clarity of presentation, the ISU monograph adopts the following conventions:

1. The term *grave* is used exclusively in reference to the physical structure (feature) used to inter the dead, while the term *burial* is used to denote the human remains found within a grave. The terms *individual, skeleton*, *interment*, and *body* are used as synonyms for burial.
2. Burials are predominantly referred to by their Master IDs in the format of SHA_YYYY.GGG.BB, where YYYY refers to the year of excavation, GGG to the grave number, and BB to the burial number (if the grave contained more than one burial). So, for example, the Master ID SHA_2001.013.03 belongs to Burial 3 from Grave 13, which was excavated in 2001. The Master ID SHA_2004.058 belongs to the burial from Grave 58, which contained only one individual and was excavated in 2004. Burials are also referred to by an abbreviation that includes only the grave and (if relevant) burial number, so Burial 13.03 and Burial 58.
3. Grave goods (synonyms: grave inclusions or accoutrements) are all archaeological objects (artifacts, faunal remains, etc.) found within the horizontal and vertical boundaries of a grave, including those associated with a burial(s) and those found higher within the grave backfill. Any exceptions or ambiguities are discussed in detail in Weber et al., 2024a.
4. For additional clarity, original Russian terms are given in brackets when considered useful.
5. Figures and Tables are numbered for each chapter separately using the following format: Chapter.Figure.Subfigure and Chapter.Table.Subtable (e.g., Fig. 1.4.A; Table 6.1.E).

Errata

During the process of preparing the ISU monograph a number of small errors were identified in the GAI monograph and corrected for this edition. None of these errors affect analyses or conclusions presented in either monograph.

GAI monograph	ISU monograph	Comments
Chapter 7 Section 7.2 Mammal remains — Marmota sibirica: These include 1533 specimens from 46 graves (Nos. 8, 11, 12, 14–18, 22, 23, 26, 33, 39, 44, 48, 51, 52, 54–56, 59, 62–65, 69, 71, 73–78, 80–82, 85, 92, 93, 95, 96, 100, 104, 108, and 112)	Chapter 7 Section 2.1 Mammal remains — Marmota sibirica: These include 1533 specimens from 44 graves (Nos. 8, 11, 12, 14–18, 22, 23, 26, 33, 39, 47, 48, 51, 52, 54–56, 59, 62–65, 69, 71, 73–78, 80–82, 85, 92, 93, 95, 96, 104, 108, and 112) and 1 ritual pit (No. 100)	Corrected number of graves from 46 to 44 and added 1 ritual pit.
Chapter 7 Section 7.2 Mammal remains — Undifferentiated mammal	Chapter 7 Section 2.1 Mammal remains — Undifferentiated mammal	Corrected total number of Bone Pendants from 417 to 387 and removed reference to pendants associated with Burial 108.02 which should not be considered a separate interment.

<table>
<tr><th>GAI monograph</th><th>ISU monograph</th><th>Comments</th></tr>
<tr><td>Chapter 8 Section 8.1:
Excluding the graves documented in the 1960s, for which very little information is available, fieldwork conducted between 2000 and 2019 yielded 97 Early Neolithic (EN), 12 Early Bronze Age (EBA) graves and a single Late Bronze Age grave (Bazaliiskii and Weber 2004; Bazaliiskii and Weber 2005).</td><td>Chapter 2 Section 1:
Excluding the graves documented in the 1960s, for which very little information is available, fieldwork conducted between 1996 and 2019 yielded 97 Early Neolithic (EN) graves, 12 Early Bronze Age (EBA) graves, a single Late Bronze Age grave, and one heavily disturbed grave whose period could not be determined (Bazaliiskii and Weber, 2004; Bazaliiskii and Weber, 2005).</td><td></td></tr>
<tr><td>Chapter 8 Section 9.5.5
The uniqueness of Row L is further underscored by the structure of the grave goods assemblage from Row K, the only other row at Shamanka II with a NE–SW orientation, located at the opposite end of the cemetery and belonging to Group 1.</td><td>Chapter 5 Section 7
The uniqueness of Row L is further underscored by the structure of the grave goods assemblage from Row K, the only other row at Shamanka II with a NE–SW orientation, located at the opposite end of the cemetery and belonging to Group 1.</td><td>Corrected group number.</td></tr>
<tr><td>Fig. 9.371.A & Table 9.13</td><td>Fig. 3.6.A & Table 3.2</td><td>Corrected number of Phase 1 individuals in the NW Cluster from 19 to 20.</td></tr>
<tr><td>Chapter 9 Section 9.3.1:
Even though there are only 10 graves built during Phase 2, 3 of these were added to rows established during Phase 1 (1 in each cluster of the cemetery) and 7 were scattered (4 in the NW Cluster and 3 in the SE Cluster).</td><td>Chapter 4 Section 1.1:
Even though there are only 10 graves built during Phase 2, 3 of these were added to rows established during Phase 1 (1 in each cluster of the cemetery) and 7 were scattered (4 in the SE Cluster and 3 in the S Cluster).</td><td>Corrected the cluster names for scattered Phase 2 graves.</td></tr>
<tr><td>Chapter 9 Section 9.3.2:
Of the 73 Phase 1 graves 38 (39%), were Reopened during Phase 1 and 7 (10%) during Phase 2;</td><td>Chapter 4 Section 1.2:
Of the 83 graves constructed during Phase 1, 28 (34%) were Reopened during Phase 1 and an additional 7 (8%) were opened during Phase 2, three of which (Gr. 23, 26, and 50) were likely opened first in Phase 1;[1]
[1] Four graves (Nos. 20, 25, 48, and 52) did not provide enough radiocarbon information to assess this matter.</td><td></td></tr>
<tr><td>Chapter 9 Section 9.3.4:
Male graves dominate Group 2 (12, 52%) and Female graves are in the minority everywhere, though Groups 1, 3, and 5 have over twice as many as Group 2.</td><td>Chapter 4 Section 1.4:
Male graves dominate Group 2 (12, 52%) and Female graves are in the minority everywhere, though in Groups 1, 3, and 5 they are more than twice as common as in Group 2.</td><td></td></tr>
<tr><td>Table 9.35: Head Direction
<table><tr><th>Head Dir.</th><th>Count</th><th>%</th><th>%*</th></tr><tr><td>E</td><td>10</td><td>6%</td><td>8%</td></tr><tr><td>SE</td><td>5</td><td>3%</td><td>4%</td></tr><tr><td>SW</td><td>4</td><td>3%</td><td>3%</td></tr></table></td><td>Table 4.20: Head Direction
<table><tr><th>Head Dir.</th><th>Count</th><th>%</th><th>%*</th></tr><tr><td>SW</td><td>10</td><td>6%</td><td>8%</td></tr><tr><td>E</td><td>5</td><td>3%</td><td>4%</td></tr><tr><td>SE</td><td>4</td><td>3%</td><td>3%</td></tr></table></td><td>Corrected entries in the Head Dir. column.</td></tr>
</table>

GAI monograph	ISU monograph	Comments
Chapter 9 Section 9.5: While it can be reasonably justified to assign the dozen or so red deer canine pendants to Burial 14.01 and the three boar tusk pendants to Burial 14.02, in both cases found on the respective skulls, the three objects found behind their heads could easily belong to either individual (Plate 4.58.2).	Chapter 5 Section 1: While it can be reasonably justified to assign the three boar tusk pendants to Burial 14.01 and the dozen or so red deer canine pendants to Burial 14.02, in both cases found on the respective skulls, the three objects found behind their heads could easily belong to either individual (Fig. 5.1).	Corrected association of boar tusk pendants to Burial 14.01 and Red Deer Canine pendants to Burial 14.02.
Chapter 9 Section 9.5.3: The 10 graves assigned to Phase 2 have almost as many Mass Ornaments as all 71 Phase 1 graves combined.	Chapter 5 Section 4: The 10 graves assigned to Phase 2 have almost as many Mass Ornaments as all 72 Phase 1 graves combined.	Corrected the number of Phase 1 graves from 71 to 72.
Chapter 10 Section 10.7: Foreign Human Bones, Fig. 10.405, Table 10.57	Chapter 6 Section 7: Foreign Human Bones, Fig. 6.2, Table 6.4	Rewrote section to account for 3 graves that were overlooked.

Acknowledgements

This monograph is the product of a cumulative effort of several people in addition to the editors. First and foremost, we extend our thanks to all the Russian students who participated in the excavations lead by V.I. Bazaliiskii. We would also like to thank the Canadian graduate students who contributed to our fieldwork, specifically M. Metcalf and C. Grayson for fieldwork photography; A. Antonova, K. Faccia, H. Vahdati Nasab, and A. Waters-Rist for handling human skeletal remains in the field; L. Fleming for assisting with the identification of bird remains; and P. Kurzybov for artifact photography. Our thanks also to N.D. Kasprishina and A.A. Tiutrin for the invaluable fieldwork documentation. We are exceptionally grateful to Prof. Mayke Wagner and Dr. Dominic Hosner, Editors of the Archaeology in China and East Asia Series, for their exemplary attention to detail in preparation of the GAI monograph which allowed for the correction of a number of minor but nevertheless embarrassing errors. Additional thanks to Mrs. Irina Kartashova-Nikitina, Izdatel'stvo Irkutskovo gosudarstvennogo universiteta, and her team for putting this monograph together so efficiently. We also acknowledge Irkutsk State University in Russia and the Social Sciences and Humanities Research Council of Canada (Grant Nos. 410-96-0353, 410-2000-0479, 412-2000-1000, and 895-2018-1004) for their continuous support of our research in the Baikal region. Additional support was provided by the Government of the Russian Federation, grant № 075-15-2019-866, for the following project: "Baikal Siberia in the Stone Age: At the crossroads of the worlds".

Chapter 1. Archaeological background, history of fieldwork, and excavation methods

Vladimir I. Bazaliiskii, Andrzej W. Weber, Erin Jessup

The general goal of the Baikal Archaeology Project (BAP) has been to identify and understand the processes associated with culture change and continuity among Late Mesolithic to Early Bronze Age hunter-gatherers in the Cis-Baikal region of Siberia (Fig. 1.1).[1] The project is based on the "individual life history" approach: long strings of empirical data that can be associated with the life of a given prehistoric individual. Launched in the 1990s, one of the project's leading themes was explanation of the apparent discontinuity observed in the mortuary archaeological record dating to the 7th millennium BP — the Middle Neolithic (Weber et al., 2010).

The main goals of this ISU monograph are: (1) to present variation within the archaeological materials, including faunal remains, acquired from the Early Neolithic features excavated at Shamanka II; and (2) to assess how the knowledge gained from the examination of these materials contributes to our better understanding of the history of the Kitoi cultural pattern in Cis-Baikal. The ISU monograph operates within the culture history model (Table 1.1) developed in previous publications (Weber, 1995; Weber et al., 2002; Weber et al., 2006) and revised most recently using a large series of radiocarbon dates corrected for the freshwater reservoir effect (Weber et al., 2016a; Weber et al., 2016b; Weber et al., 2021).[2]

Table 1.1. Culture history model for the Cis-Baikal region, Siberia (after Weber et al., 2021: Table 6)

Period	Mortuary Tradition(s)	Calibrated age before present
Late Mesolithic (LM)	Khin Group	8630–7560
Early Neolithic (EN)	Kitoi, Khin Group	7560–6660
Middle Neolithic (MN)	Hiatus	6660–6060
Late Neolithic (LN)	Isakovo, Serovo	6050–4970
Early Bronze Age (EBA)	Glazkovo	4970–3470

[1] Cis-Baikal is an area of 200,000–250,000 km^2 located immediately west of Lake Baikal between its northwest coast, including Ol'khon Island, and roughly to Ust'-Ilimsk on the Angara and Ust'-Kut on the Lena. To the north and west of Lake Baikal the limits of Cis-Baikal are quite arbitrary as there are no sharp geographic boundaries.

[2] Micro-regional models are presented in Weber et al., 2021.

Figure 1.1. Cis-Baikal region, Siberia, with known Late Mesolithic–Early Bronze Age cemeteries. Figure by chapter authors

Legend:

1 Shchukino
2 Bolshaia Mezhovka
3 Ershi
4 Kuzmikha
5 Malaia Razvodnaia
6 Lesikha
7 Glazkovo
8 Lokomotiv
9 Pereselencheskii Punkt
10 Reka Kaia
11 Pad Ushkanka
12 Pad Sukhovskaia
13 Strelbishche
14 Kitoi
15 Usole
16 Galashikha
17 Ostrov Rodion
18 Shumilikha
19 Ust'-Belaia
20 Ponomarevo
21 Balushkina
22 Buret
23 Verkhniaia Buret
24 Sukhaia Pad I
25 Sukhaia Pad II
26 Pad Chastye
27 Pad Lenkovka
28 Ust'-Dolgaia
29 Pad Sviataia
30 Pad Kalashnikova
31 Pad Makhonkina
32 Sobachii Log
33 Semenovo
34 Itsygun
35 Kamenka Ostrog
36 Ust'-Ida I
37 Podostrozhnoe
38 Kirpichnyi Sarai
39 Gorodishche
40 Gorodishche II
41 Pad Ugolnik
42 Garankin Log
43 Pad Nokhoi
44 Pad Khinskaia
45 Churinskii Lozhok
46 Pad Glubokaia
47 Gudaev Log
48 Selo Kazache
49 Bumazhkino
50 Golomyska
51 Evseevo
52 Verkhneseredkino
53 Nizhneseredkino
54 Zaimka
55 Ust'-Osa
56 Ostrov Osinskii
57 Shivera
58 Riutino
59 Ust'-Uda
60 Serovo
61 Anosovo
62 Igirma I
63 Igirma II
64 Rasputino
65 Balinskaia
66 Moka
67 Rechka Kezhemka
68 Zaiarsk
69 Bolshaia Mamyr
70 Malaia Mamyr
71 Rechka Luchikha
72 Isakovo
73 Monastyrskii Kamen
74 Bratskii Kamen
75 Shamanka
76 Abakshino
77 Ostrov Fedorovskii
78 Tushama
79 Karapchanka
80 Ostrov Zhiloi
81 Manzurka
82 Ulus Khalskii
83 Khabsagai
84 Makrushino
85 Iushino
86 Belousovo
87 Staryi Kachug
88 Zvezdochka
89 Popovskii Lug II
90 Rytvinka
91 Makarovo
92 Shishkino
93 Silinskii
94 Nikolskii Mys
95 Nikolskii Grot
96 Verkholensk
97 Ust'-Talma
98 Obkhoi
99 Ust'-Yamnyi I
100 Korkino
101 Zapleskino
102 Vorobevo
103 Ust'-Tutura
104 Zhigalovo
105 Tikhoe Pleso
106 Ust'-Ilga
107 Niashenskii Perekat
108 Turuka
109 Zakuta
110 Podymakhino
111 Kirensk
112 Typta
113 Fofanovo
114 Khotoruk
115 Ulan Khada II
116 Ulan Khada III
117 Ulan Khada IV
118 Ulan Khada V
119 Ulan Khada VI
120 Sagan Nuge
121 Shide I
122 Sarminskii Mys
123 Uliarba
124 Kulgana
125 Khuzhir Nuge VI
126 Elga III
127 Khalurinskii Mys
128 Shrakshura II
129 Shamanskii Mys
130 Kharansa I
131 Kharansin I
132 Budun
133 Ust'-Ilir
134 Rechka Kezhma
135 Educhanka
136 Ust'-Toisuk
137 Elgen
138 Kurma XI
139 Ilimsk
140 Shestakovo
141 Khuzhir-Nuge XIV
142 Shamanka II
143 Kurma XIX
144 Bolshaia Mezhovka II
145 Tutura
146 Zhigalovo Aeroport
147 Khankhoiskaia Guba I
148 Khadarta IV
149 Borki
150 Stepnoe Kartukhai
151 Sokhter IX
152 Kaiskaia Gora
153 Most (Irkutsk)
154 Roshcha Zvezdochka
156 Badai
158 Mys Uiuga
159 Khuzhir-Nuge IX
160 Moty-Novaia Shamanka
163 Shidinskii Prichal I
165 Assol' Cave
168 Kotin Ostrov
169 Tuyana
176 Nikilei 5
177 Tolmachevo
178 Tuakhane IX
179 Ozero Ochaul

1. Archaeological background

BAP research completed to date has been summarized recently in a series of papers published as a special issue of the Archaeological Research in Asia (Bondetti et al., 2020; Bronk Ramsey et al., 2021; Goriunova et al., 2020; Goriunova et al., 2021; Kobe et al., 2020; Moussa et al., 2021; Osipov et al., 2020; Scharlotta et al., 2021; Scharlotta et al., 2022; Schulting et al., 2022; Temple et al., 2021; Waters-Rist et al., 2021; Weber, 2020; Weber et al., 2021).[3] Most generally, our current views on the subject emphasize the spatio-temporal variation in the development of Middle Holocene hunter-gatherer adaptive strategies and cultural patterns (c.f., Bronk Ramsey et al., 2021; Weber, 2020; Weber et al., 2021). The following is a summary of these views.

Late Mesolithic (LM) 8630–7560 cal. BP

During this period the Cis-Baikal region was populated by small, stable populations that nevertheless experienced crowding due to expanding forests and a shrinking open landscape effected by an increasingly warm and wet climate. This crowding resulted in increased inter-group competition for game resources and populations were highly mobile with limited socio-political differentiation. Subsistence relied on group hunting of large game with the atlatl and spear and the non-intensive exploitation of aquatic resources. Formal cemeteries were very small, containing at most a few graves and single graves were not uncommon. The LM mortuary tradition is often referred to as "Khin" but this is an umbrella term encompassing over 50 graves displaying significant variation across the entire region.

Early Neolithic (EN) 7560–6660 cal. BP

The BAP operates using the definition of the Neolithic as generally accepted in Siberian archaeology. Thus, the Neolithic is defined by the appearance of pottery, the bow and arrow, and stone polishing techniques (Weber, 1995), that is, in technological terms rather than by the advent of food production (farming and pastoralism), as is typically the case in the archaeology of western Eurasia. This ensures conceptual and terminological consistency with the rest of the archaeological research conducted in the Baikal region as well as across Siberia.

The EN appears to show the most structural and spatial variation of all the culture historical periods presented here. During this time the forest continued to expand while the human population grew, resulting in further crowding within the open landscape and along ecotones. In these centers of higher population densities game resources were likely substantially depleted. This increased inter- and intra-group competition for access to resources manifested very differently along the Angara and in SW Baikal, which saw the rise of the Kitoi cultural pattern, compared to the Little Sea and the Upper Lena, where the LM–Khin pattern persisted well into the EN.

The Kitoi cultural pattern brought with it many technological innovations, the most important of which was arguably the bow and arrow which allowed for individual hunting of large, medium, and small game. The higher success rates associated with bow-hunting freed up labour which was then redirected towards the intensification of fishing. Hunter-gatherer population was unevenly distributed across the landscape with a few small and medium groups and a small number of very large groups. Kitoi groups displayed significant social differentiation, experienced substantial physical and physiological stress,

[3] C.f., the references therein for the complete record of the research conducted by the BAP.

and functioned within well-defined home ranges (likely tied to specific fisheries) employing relatively low mobility. Cemeteries of the Kitoi mortuary tradition were medium to very large, some of which contained over 100 interments (e.g., Lokomotiv in Irkutsk and Shamanka II on SW Baikal).

Elsewhere in Cis-Baikal, rich and reliable fisheries and open landscape for hunting did not coincide, precluding the formation of the Kitoi pattern. In these areas, as previously mentioned, the LM–Khin pattern continued throughout the EN with little change.

Middle Neolithic (MN) 6660–6060 cal. BP

During the MN the forest reached its maximum expansion and the Kitoi population was forced to disperse into small, highly mobile groups that subsisted on a combination of terrestrial game, aquatic resources, and plant foods. Individual bow-hunting of large, medium and small game continued but the intensive fishing of the Kitoi disappeared and was replaced by small-scale, non-intensive practices. Groups in this period experienced low inter- and intra-group competition for resources and exhibited low social differentiation. There are no formal cemeteries dating to the MN.

Late Neolithic (LN) 6050–4970 cal. BP

After reaching its peak in the MN, forest cover began to wane as the climate became cooler and drier. By the LN, patches of open landscape were large enough to support the hunter-gatherers that came out of the retreating forest. These people lived in stable small to medium-sized groups with crowding in the open areas and along ecotones encouraging a relatively high degree of mobility. They experienced moderate inter- and intra- group competition, moderate social differentiation and better overall health compared to the EN. Individual bow-hunting of large, medium and small game continued and although there was some consumption of aquatic foods, environmental conditions favored game hunting. Intensive fishing never developed or, at least, not to the same level as during the EN.

The LN saw the reappearance of formal cemeteries which ranged in size from small to medium. Although this period exhibited a narrower range of microregional differences compared to the EN, there were nevertheless two parallel mortuary traditions: Isakovo (on the Angara and, perhaps the Upper Lena)[4] and Serovo (Angara, Little Sea, and Upper Lena), which differ mainly in burial orientation and characteristics of clay pots, and possibly also of some other tools, utensils, and ornaments.[5]

Early Bronze Age (EBA) 4970–3470 cal. BP

As the forest continued to retreat throughout the EBA, the hunter-gatherer population grew until there was a large number of small to medium groups crowded within the patches of open landscape and along ecotones. These groups exhibited lower mobility, moderate inter- and intra-group competition and moderate social differentiation. Subsistence relied on individual bow-hunting of terrestrial game, seal hunting on Lake Baikal, and non-intensive and less intensive forms of fishing. The EBA Glazkovo mortuary tradition is visible in all four microregions of Cis-Baikal. Cemeteries range in size from small to large; the number of graves and cemeteries is considerably higher than in the LN.

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[4] Recent reassessment of the Verkholensk cemetery on the Upper Lena suggests the presence of one Isakovo grave among a number of Serovo graves (Goriunova et al., 2020; Weber et al., 2021).

[5] Russian scholars frequently assign specific names to these microregional variants (e.g., Archaic tradition of the Upper Lena; Bazaliiskii, 2010; Okladnikov, 1978), however, for the purpose of this overview, the use of a single term (i.e., Serovo), is considered sufficient.

2. Shamanka II cemetery

The Shamanka II cemetery is located on a narrow peninsula (Mys Shamanka) consisting of four hills, which extends ~600 m into the southwest corner of Lake Baikal (51°41'54" N, 103°42'11" E; Fig. 1.1; Fig. 1.2; Fig. 1.3; Fig. 1.4). It is the largest completely excavated Kitoi cemetery in the Cis-Baikal region and the only cemetery within the area extending west from the coast of Lake Baikal to the Tunka Valley. Although reports of archaeological surface finds from Mys Shamanka date back to the 1890s, the first grave was not unearthed until 1962 when A.V. Tivanenko and A.I. Komissarov excavated an EBA grave from the causeway connecting the second and third hills (the area now designated Shamanka III). In 1963 or 1964, and again in 1965, Tivanenko and Komissarov excavated two graves from about 22–27 m up the southwest-facing slope of the second hill, the area which came to be known as Shamanka II (Table 1.2). No fieldwork took place at Shamanka II for over 30 years, until a single heavily-disturbed grave (No. 1) was excavated by V.V. Makhno in 1996 and 5 more (Nos. 2–4, 6 and 7) were rescued from the collapsing cliff by A.V. Kharinskii and G.V. Turkin of Irkutsk State Technical University in 1998 and 1999 (Turkin and Kharinskii, 2004). Beginning in the year 2000, the cemetery was subjected to large-scale systematic fieldwork directed by V.I. Bazaliiskii of Irkutsk State University, under the auspices of the BAP.

Excluding the graves from the 1960s, for which little information is available, Shamanka II has yielded a total of 111 graves, 1 cenotaph and 4 ritual pits (Table 1.2): 97 graves, 1 cenotaph and 3 ritual pits from the EN, 12 graves and 1 ritual pit from the EBA, 1 grave from the LBA, and 1 heavily disturbed grave with archaeological information insufficient for chronological classification (Bazaliiskii and Weber, 2004; Bazaliiskii and Weber, 2005). The ISU monograph focuses on the EN component of the Shamanka II cemetery, and henceforth all references to the cemetery or SHA refer only to the 101 features dated to the EN.

Table 1.2. History of archaeological fieldwork at Shamanka II. Note: "0" values have been removed

No.	Excavation year	1963/64	1965	1996	1998	1999	2000–2008	2019	Total
1	EN graves		1		2	1	92	2	98
2	EBA graves	1			2		8	2	13
3	LBA graves						1		1
4	m.d. graves			1					1
4	EN ritual features						3		3
5	EBA ritual features						1		1
6	EN cenotaph						1		1
	Total	1	1	1	4	1	106	4	118

The features of this cemetery form several discernible spatial arrangements (Fig. 1.5), the most obvious being the separation of the North and South Sectors. The North Sector, consisting of 73 graves, 1 cenotaph and 3 ritual pits, occupies the upper part of the slope and the top of the hill, roughly 23–28 m above the lake. It measures about 48 m N–S and 29 m E–W. The 24 graves of the South Sector (also referred to as the South Cluster) are located downslope to the SW, roughly 18–22 m above the lake, and are separated from the North Sector by a ~12 m wide area devoid of graves. Following the shoreline, the South Sector measures about 28 m NE–SW and 8 m SE–NW. The North Sector is further divided

into the Northwest and Southeast Clusters. Though a somewhat less clear distinction than that between the North and South Sectors, the clusters of the North Sector are nevertheless separated by a 3–4 m band of land with no archaeological features, corresponding roughly to a narrow seam of exposed marble bedrock. The Northwest Cluster consists of 23 graves, 1 cenotaph, and 3 ritual pits while the Southeast Cluster contains 50 graves.

A

B

Figure 1.2. Aerial photographs of Shamanka II. Figure by the BAP:

A. From SE
B. From SW

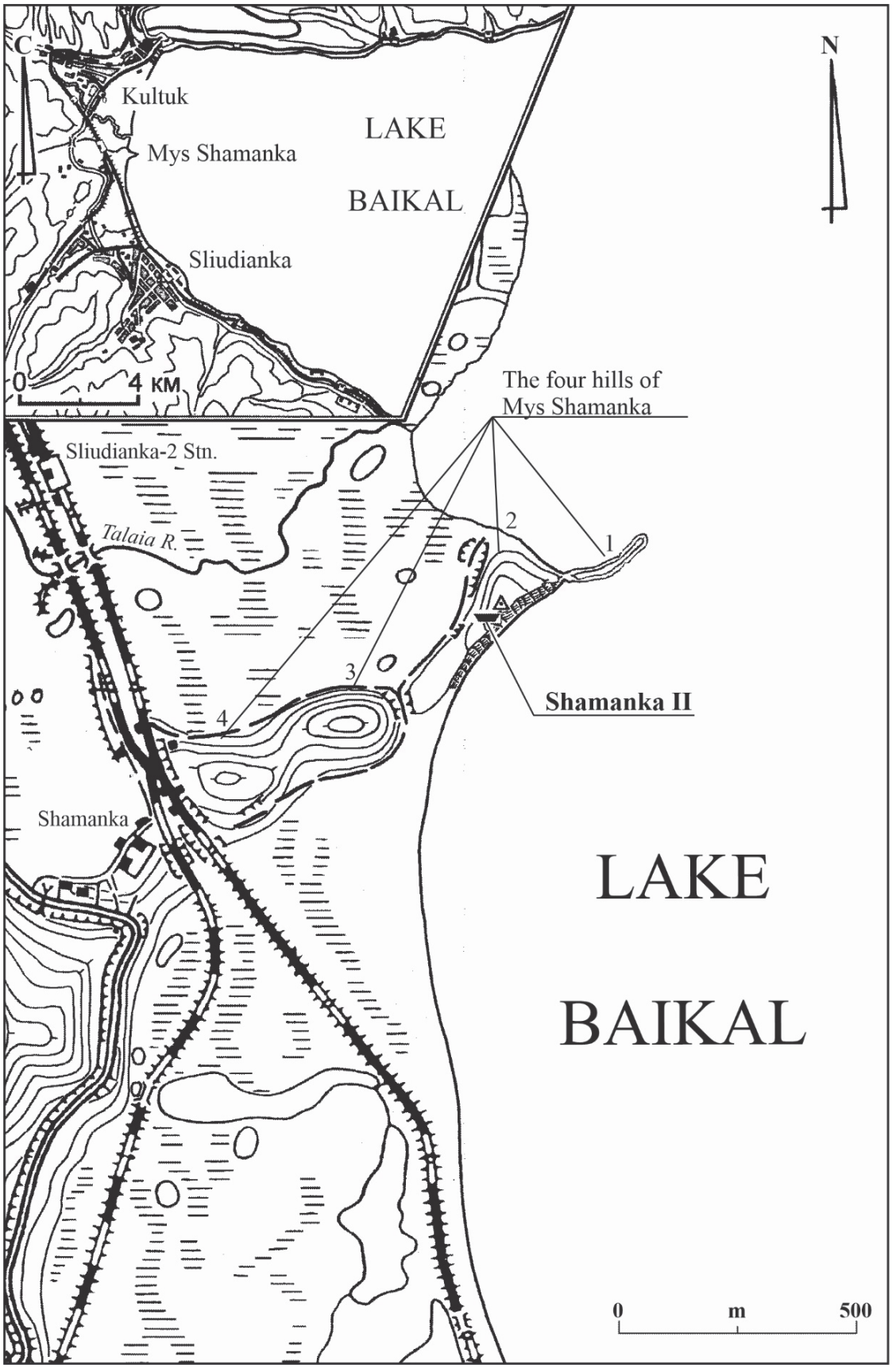


Figure 1.3. Map of Mys Shamanka on Lake Baikal, showing the location of the four hills that make up the peninsula and the location of the Shamanka II cemetery. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii

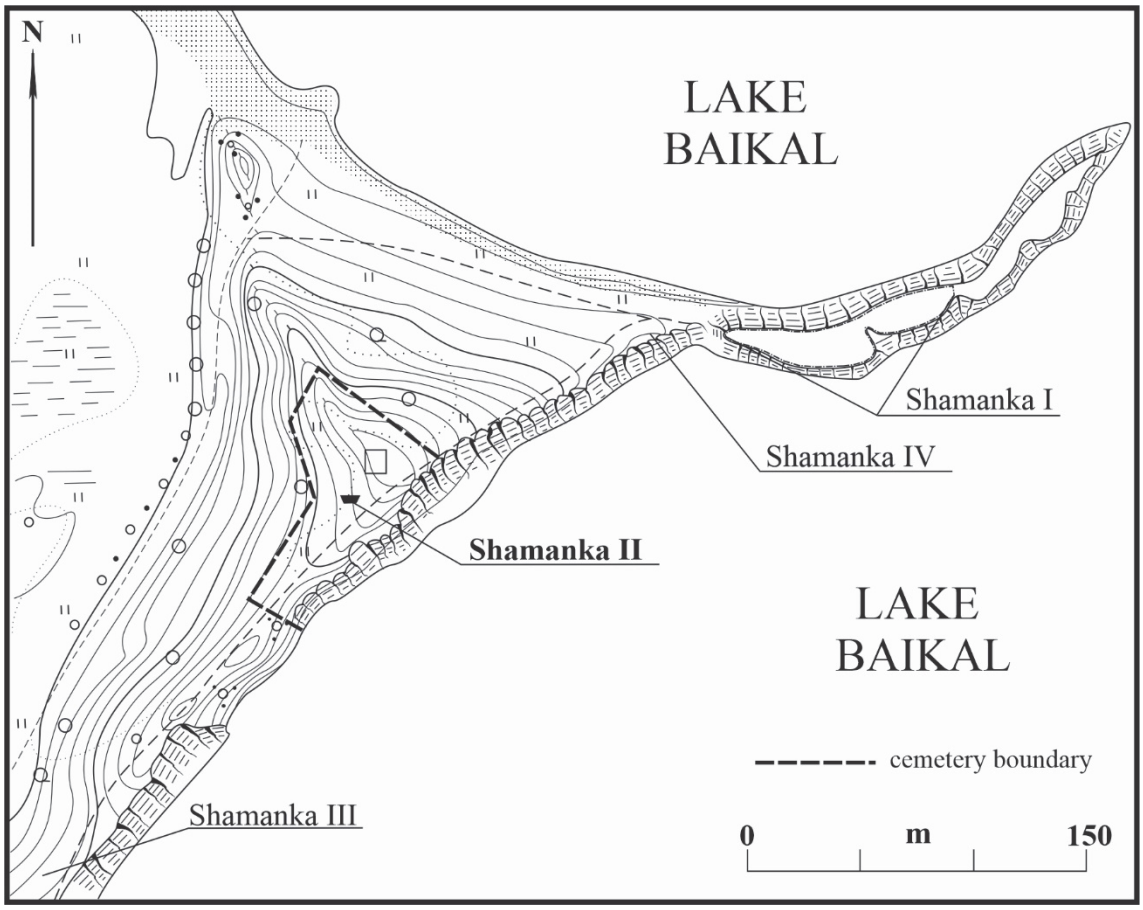


Figure 1.4. Close up of Mys Shamanka, showing the location of the four cemeteries: Shamanka I, Shamanka II, Shamanka III, and Shamanka IV. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii

Most (n = 62) of the graves at Shamanka II are arranged in rows, defined as a minimum of 3 graves side by side with their long axes roughly parallel. A total of 13 rows have been identified, 11 running NW–SE (i.e., perpendicular to the cliff) and roughly following the contour lines of the hill, and 2 running SW–NE (i.e., parallel to the cliff): Row K in the South Sector and Row L in the Southeast Cluster of the North Sector. Graves constructed outside of row formations are referred to as scattered.

The graves at Shamanka II were mostly oblong pits, that is, the size and shape required to accommodate one or more human bodies in extended position. They generally began 20–25 cm below the modern surface and were dug from a layer of bright brown loam down to the marble bedrock (1.10–1.80 m). There was no evidence of stone or timber grave markers on the modern surface. Most graves contained single burials, though graves with 2–5 individuals were not uncommon. In some graves the multiple burials were synchronous (i.e., interred at the same time) while in others they were asynchronous (i.e., subsequent additions; Bazaliiskii, 2010). A single feature (No. 97) contained no burial despite its purposeful construction and is referred to in this monograph as a cenotaph. Many of the graves were reopened and/or disturbed in prehistory and a large number of burials have substantial parts of their skeletons missing (Bazaliiskii, 2010; Bazaliiskii et al., 2024; Lieverse et al., 2024). Skeletal completeness of the burials ranges from a few elements to essentially complete skeletons. Many graves also include a few bones of other individuals, which are neither considered discrete interments nor included in the burial count (c.f., Chapter 6).

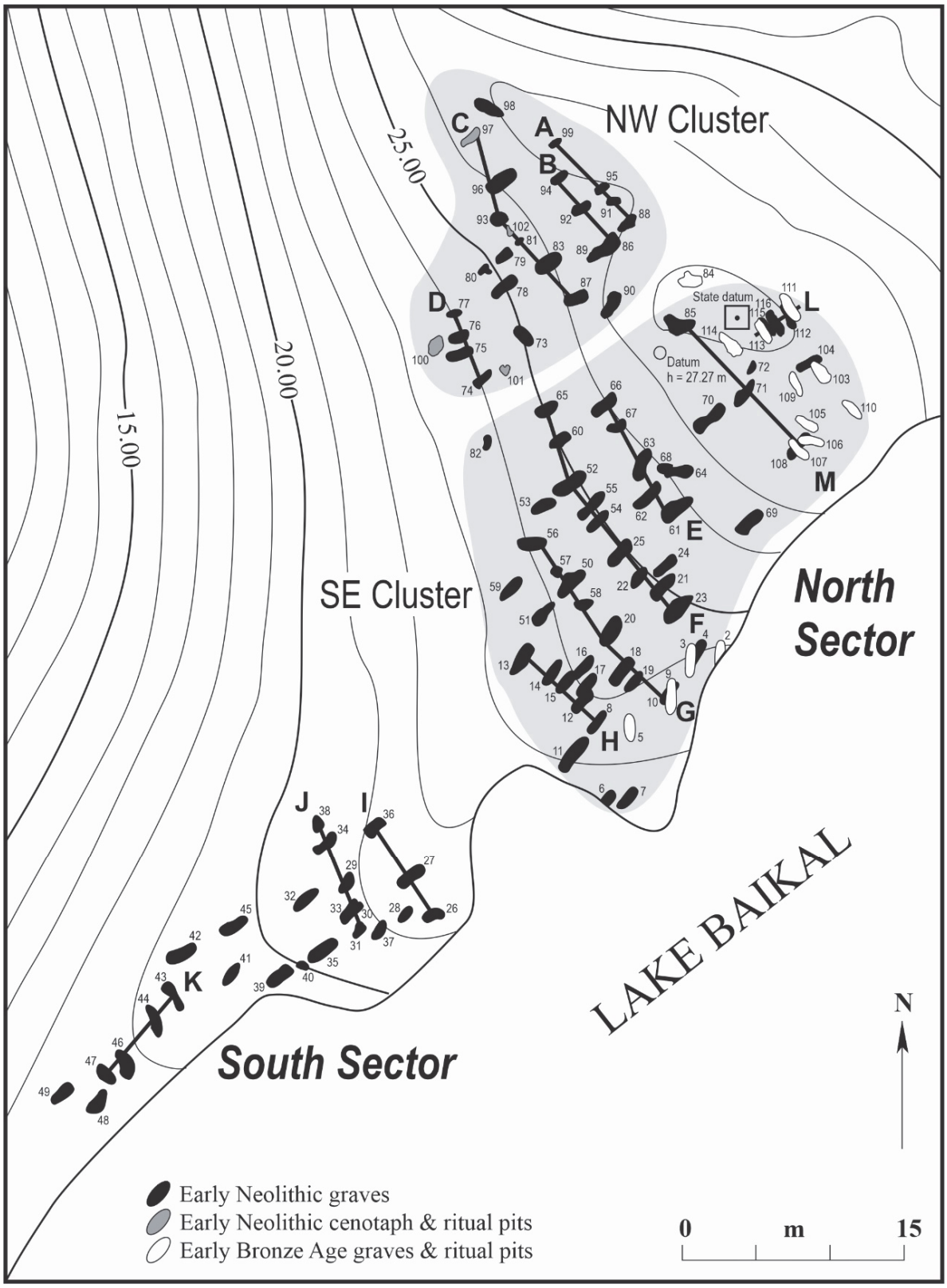


Figure 1.5. General map of Shamanka II showing the distribution of excavated graves with sectors, clusters and rows. Figure by chapter authors

A number of characteristics of the graves and burials at Shamanka II fit clearly within the Kitoi mortuary tradition, found mainly along the Angara River (Bazaliiskii, 2010; Okladnikov, 1950; Okladnikov, 1974; Okladnikov, 1975; Okladnikov, 1976). These features include a supine body position, roughly N–S burial orientation, multiple interments in the same grave (sometimes arranged head-to-toe), and the use of red ochre. Typical Kitoi grave goods at Shamanka II include arrowheads, composite tools (e.g., daggers, spearheads), composite fishhook shanks, objects of zoomorphic art, marmot teeth etc.

3. Excavation methods

Fieldwork was conducted following the protocols developed in Russia and the Baikal region to maximize recovery of archaeological data of the best possible quality and quantity (Fig. 1.6; c.f., Kamenetskii, 1986; Krasnov, 1989; Mamonova et al., 1989; Smirnov, 1991). The methods employed at Shamanka II were all tested previously by the field director (V.I. Bazaliiskii) at his excavations at such large middle Holocene cemeteries as Lokomotiv and Ust'-Ida I on the Angara in the 1980s and 1990s, and by the Canadian team at Khuzhir-Nuge XIV and Kurma XI in the Little Sea area between 1997 and 2003 (Weber et al., 2007; Weber et al., 2008; Weber et al., 2012).

3.1. Preparatory work

Prior to actual excavations, a number of preparatory measures were undertaken. First, the area where A.V. Kharinskii and G.V. Turkin placed their two small trenches in 1998 was visually inspected for any surface archaeological finds. The search for artefacts, human bones, or animal remains involved the careful inspection of the exposed cliff on the SW side of the cape, rodent burrows, and the trail along the edge of the cape. Second, site geomorphology was examined in order to demarcate a tentative outline of the cemetery, to plan the progress of work and the placement of excavation trenches. More specific information about conducting this kind of work is available in several textbooks on topography (Alekseev et al., 2002; Bakanova, 1980; Gospodinov and Sorokin, 1974).

The next step involved topographic survey and mapping of the entire site area. This was necessary not only to keep track of the spatial location of individual graves and other features identified via excavations, but also for comparison of site relief with the other known EN cemeteries (Fig. 1.3; Fig. 1.4). All elevations were measured relative to the level of Lake Baikal as of August 17th, 2000. Several additional datum points were established at different locations around the site with elevations measured also relative to Lake Baikal. The contour maps show the boundaries of the EN cemetery located on the top and SW slope of the second hill of Mys Shamanka (Fig. 1.4).

Concurrently with the topographic survey, comprehensive photographic documentation of the site was undertaken. The photos, taken from various angles and positions, included a scale, N arrow, and board with cemetery name. The cemetery and the surrounding area were described in detail in a field book.

A

B

C

D

E

F

Figure 1.6. Shamanka II, work in progress. Figure by the BAP:

A. Photographic documentation
B. Drawing a grave plan
C. Establishing the grid
D. Documentation of burial characteristics prior to removal of bones
E. A trench
F. Cleaning a burial prior to photography

3.2. Trench layout

A grid system of 30 units (пикет), each 100 m^2 and identified by a Roman numeral, was established over the entire area of the cemetery using an optical theodolite and measuring tape. Each unit was further subdivided into smaller 1×1 m squares (квадрат), numbered continuously with Arabic numerals starting with No. 1 at the NW corner of each larger unit. The grid system was drawn onto technical grid paper in two scales: 1:50 and 1:20. A third plan, in 1:100 scale, was used as a general site map. Before excavation commenced, additional elevations were measured at each corner of every 1×1 square. These measurements, calculated relative to the main archaeological datum point (27.27 m above Lake Baikal), were next transferred onto the 1:50 map to facilitate subsequent reconstruction of site micro-relief. All visible disturbances and large rocks present on the surface were marked on the 1:20 map. Since the cemetery area was relatively large and it was expected that excavations would take several years, the corner stakes of the trenches were driven deep into the ground to enable their long-term use. The grid system aligned with cardinal directions: N–S and E–W.

3.3. Excavations

Mys Shamanka is both a nature sanctuary and a popular tourist destination. The first and second hills are also periodically the sites of contemporary shamanistic rituals. In order to limit excavation of areas lacking archaeological features and to minimize disturbances to the rare and archaic grasses, only relatively small trenches were laid out which were then gradually expanded as needed based on the presence and placement of mortuary features. The turf layer was removed in blocks c. 0.30×0.40 m and piled up along the trenches for backfilling and topsoil restoration. Returning the blocks after backfilling the trenches allowed full restoration of surface vegetation within one week.

The cemetery was excavated by means of exposing the entire area of each trench. Fieldwork was conducted using two different approaches designed for excavating cemeteries with pit graves of this kind, both of which have advantages and disadvantages. One technique involved work over a larger part of the trench and stockpiling removed earth outside of the trench boundaries. This method allowed for the monitoring of spatial relationships between several graves at a time. However, the downside was that the volume of earth removed from the trench was frequently so large that it posed significant handling problems and a danger to the graves by means of strong winds, torrential rain, or animals and people. The other technique concentrated on a much smaller area, from 4 to 10 m^2, stockpiling earth within the trench. In this case, it was only possible to monitor a small part of the excavated trench at any given time but the advantage was that the method allowed much more detailed documentation of grave and trench profiles and it minimized the risk of unnecessary damage to the exposed archaeological features.

All earth was removed from trenches manually without the assistance of heavy excavation equipment. The entire excavation process could be divided into two stages: (1) the gradual removal of matrix and exposure of the cultural layer, and the identification of the level from which grave pits and ritual features were established; and (2) excavation of individual graves and ritual features. Excavations were conducted with tools such as shovels and trowels of various shapes and sizes. As mentioned, a small area was excavated first and gradually expanded as necessary. Excavations proceeded from one edge of a trench across toward the other in such a way as to enable documentation of longitudinal or cross-sections of encountered features. In the process, all artefacts, mortuary or ritual

features, rocks (clusters or individual), hearths, ash-pits, ochre stains, etc. were plotted in 1:10 and 1:20 scales. Artefacts, bones, and mortuary or ritual features had elevations taken and were photographed individually or together as necessary. Photographic documentation was taken with analog and digital SLR cameras using lenses of different focal lengths (lenses of short focal length permit high quality panoramic views of large areas while lenses of longer focal length are more applicable to smaller views and close-ups). All profiles of the excavated units were documented by hand drawings (in the same scale as floor plans, e.g., Fig. 3.4) and photographed. Once excavation in a trench was completed, it was backfilled, re-turfed, and work moved to a new trench. All units designated for excavation were plotted on the general site map. Furthermore, each trench was mapped separately in 1:50 and 1:100 scales. The portion of the grid system designated for excavation was photographed with appropriate scale, N arrow, and photo board displaying the cemetery name, unit, and square numbers.

3.4. Excavation of grave pits

Since essentially all EN graves and ritual pits lacked surface structures, grave pits were identified based on the matrix characteristics of the upper level. In most cases, top levels of EN features were easily observable due to the much darker colour of grave pit sediments relative to that of the Holocene climatic optimum layer. Upper grave pit edges were identified while cleaning the profiles of excavated graves and their surrounding area. The upper levels of grave pits were documented on both floor plans and profiles. The documentation protocol followed the same principle of using the intersection of the long- and cross-section as the point of reference and the grave pit was excavated by quadrants. The upper boundaries of grave pits were usually somewhat disturbed and blurred, sometimes displayed as multiple separate dark stains of humus-like or ashy sediment. With increased depth the boundaries and shape of grave pits frequently changed. Such changes were recorded in the field notes and on profiles and plans by the means of additional boundary lines at different depths (i.e., excavation levels).

If the pit was simple, shallow, and displayed clear boundaries, two floor plans were usually sufficient: one at the top of the pit, and one at the burial level. More complex pits were documented more frequently: steps, linings, and niches were all recorded and their depth and dimensions measured. Any ash or ochre stains, artefacts, faunal remains or human bones present in the grave pits were recorded on floor plans and profiles and their elevations documented although not included on the accompanying drawings (e.g., Fig. 3.5.A). Prior to drawings, every excavation level was photographed with all relevant information displayed on a photo board cross-referenced with information included on floor plans and profiles. Normally, at the level at which a human skull was exposed, grave pit boundaries were very clearly visible and thus recorded on graph paper and photographs. At this level, excavation was confined to grave pit boundaries. Each located grave pit was excavated to completion within a single day in order to eliminate the risk of disturbance by visitors.

4. Excavation and documentation of burials and grave goods

As soon as human bones started to appear, further cleaning continued exclusively with the help of small brushes and trowels and knives made of wood or plastic. All metal excavation tools were put aside as those posed a risk of unnecessary physical damage to the human bones as well as to various grave goods made of bone or antler or other even more fragile materials. The matrix from around the skeleton was removed in thin slices, collected on a dustpan and transferred onto a 3 mm sieve for screening. The cleaning of a skeleton started in the area between the skull and the end of the grave pit, then moved around both sides of the skull, and then onto the rest of skeleton. Skeletons in graves with multiple interments arranged on top of one another were exposed sequentially whenever possible. Particular attention was paid to the association of grave goods with a specific interment. The bones of the skeleton and the grave goods were exposed as much as possible, ensuring that none got dislocated from their original position during the process. The cleaned burial was photographed with a scale, N arrow, and a board with relevant archaeological information (cemetery name, grave number, and excavation level). Photos were taken from different angles and distances. Close-up photographs of various details (e.g., position of hands, legs, skull, grave goods clusters, etc.) were also taken. Photographic documentation completed, the next step focused on hand drawings in 1:10 and 1:5 scale.

Grave pit boundaries, human skeleton(s), grave goods, any remnants of additional elements such as ash-pits, ochre stains, and rocks were all mapped. The plan was next tied into the site grid system with relevant excavation units and lines of long- and cross-sections marked (e.g., Fig. 3.4). However, since documentation included in this monograph shows only long-sections, the points marking cross-sections have been omitted. Elevations taken at various spots on and around the skeleton were also recorded on the plan. Their number depended on the particular configuration (body position, preservation, articulation, etc.) but normally included measurements of the skull, mandible, vertebral column, pelvic bones, long bone joints, hands, and feet. Elevations were also recorded for grave goods clusters, individual objects, ash-pits, ochre stains, rocks, and the floor of the grave pit. Azimuth measurements, using a hand-held surveyor compass (Brunton type), included upper body orientation and angle of the face relative to the cardinal directions.

4.1. Documentation of grave goods

The quantity of grave goods was highly variable at Shamanka II: from none, through several or tens, to hundreds of items. In most cases the grave goods were arranged in clusters at the level of the burial. In some cases, grave goods were placed at the bottom of the grave pit underneath the skeleton. In undisturbed graves with human remains in their articulated burial position, recording of grave goods began in the head area and progressed towards the feet. Contours of each object were hand-drawn on a grave floor plan with black ink. The azimuth of the working edge or point, as well as the long- and cross-inclination of object clusters, were measured with a surveyor's compass, and elevations of every item were taken. Each object was assigned its own inventory number, which was marked on the floor plan and recorded in a separate log of archaeological finds. The log records included the inventory number, its typological designation, material from which it was made, its placement relative to the skeleton, azimuth, inclination, and elevation. After laboratory processing and the preparation of a field report, the log was appended with the

appended with the number assigned to the object's line drawing. Large concentrations of grave goods were hand-drawn on separate plans in 1:1 or 1:2 scale. These additional drawings also displayed the inventory number of each object and their elevation. Such clusters were excavated gradually layer-by-layer, each documented on separate hand-drawings.

Once documentation of exposed grave goods (i.e., those located in places other than underneath skeleton) was completed, the objects were removed from the grave pit and packed and labelled individually. Finds exposed during the process of removing human bones were documented using the same protocol.

In many graves, human bones (often representing incomplete skeletons) and grave goods were scattered in disarray around the entire grave pit, both horizontally and vertically. This pattern can be accounted for not only by post-mortem rituals or past grave disturbances, which altered the original archaeological context, but also by the particulars of the mortuary ritual itself. These may have included the exposure of the dead to elements prior to burial for a substantial amount of time and the subsequent interment of a partially decomposed (or even entirely defleshed) body, a secondary burial, and the addition of "stray" foreign human bones due to other ritual activities. Such instances required particular attention to detail in recording the location and context of each individual bone or artefact. Excavation of each grave was continuously monitored for any evidence of post-mortem re-opening.

As the last step of archaeological documentation, extensive illustrations, and photographs of the Shamanka II grave goods assemblage were compiled in a laboratory setting, some of which are included in this monograph.

4.2. Excavation and documentation of human remains

The proper excavation, removal, and handling of human remains represented an important part of the fieldwork conducted at Shamanka II. These tasks were closely supervised by the field director (V.I. Bazaliiskii), as well as by a number of physical anthropologists (c.f., Weber et al., 2024a for more details). All were trained by Dr. Angela Lieverse, the leading human osteologist at similar excavations conducted by the BAP from 1997 to 2002 at the Khuzhir-Nuge XIV and Kurma XI cemeteries in the Little Sea micro-region (Weber et al., 2007; Weber et al., 2008; Weber et al., 2012). Their responsibilities included the direct removal of human remains (with assistance from a few specifically-trained crew members) as well as the collection of significant amounts of data at the time the bones were lifted from the graves (c.f., Weber et al., 2007 for more details).

Whenever the condition of the osteological remains made it possible, each individual bone or tooth recovered from a grave was identified, sided, and packed separately. These procedures substantially assisted the subsequent laboratory examination of this material, especially with regard to skeletal elements which, once removed from their articulated *in situ* positions, would have been difficult to identify (e.g., fragmentary dental, manual, and pedal elements). In cases where the skeletons were incomplete, the missing bones were recorded on a separate schematic chart of a human skeleton. Some parts of the skeleton were handled with special care during the process of excavation, removal, and packing. These included nasal and pubic bones, both frequently very fragile.

Sampling for various laboratory analyses was also an important task at Shamanka II. Some of the sampling took place during the actual excavation process, while the rest was done immediately after the fieldwork season. Sampling at Shamanka II was generally directed by the research objectives of the BAP; in this particular case, it involved obtaining

a variety of biochemical signatures of past human behaviour preserved in the human remains and focused on both human bone and tooth tissues. More specifically, the skeletal remains of each excavated individual were sampled for analyses such as radiocarbon dating; isotopic ratios of carbon, nitrogen, and strontium; trace elements; and ancient DNA. Whenever possible, approximately 15–20 g of bone tissue were collected for all biochemical tests, with preference given to identifiable elements that were already fragmented and held no, or minimal, osteobiographical information. In addition to bone tissue, the first, second, and third molars of all individuals for whom these elements were present were also sampled.

Documentation of the human osteological material was conducted using the protocols established and tested at Khuzhir-Nuge XIV and Kurma XI and involved the use of two sets of data collection forms. The first set employed templates for the collection of the standard osteobiographical data, based on the approach developed by Buikstra and Ubelaker (1994). Importantly, some of this information had to be collected in the field, particularly when the relevant osteological elements and features were in danger of being destroyed by their removal or transport from the field to Irkutsk State University.

The second set of osteological data collection forms accounted for variation with regard to the preservation of surviving human remains. The data collection protocol, developed by A. Lieverse (Lieverse, 1999; Lieverse, 2007), used each skeletal element as a separate unit of analysis, which was documented in terms of its presence, fragmentation, completeness, and articulation. These data were collected mainly to understand better the taphonomic processes and their impact on the human remains at Shamanka II. This information was later used to prepare the skeleton charts mentioned earlier.

In sum, the assortment of excavation, documentation, and sampling methods employed at Shamanka II from 2000 to 2008 and in 2019 shall be considered an optimal balance between the resources available (funding, personnel, time, and equipment) and the research goals of the BAP to which this Early Neolithic cemetery was expected to contribute a large body of invaluable data to the benefit of the general archaeological community — local, national, and international.

Chapter 2. Chronological and dietary variation

Andrzej W. Weber

1. Introduction

Much research has been dedicated over the last 20 years to the chronology of and dietary variation among Middle Holocene hunter-gatherers in the Cis-Baikal region of Eastern Siberia (e.g., Bronk Ramsey et al., 2021; Weber et al., 2016a; Weber et al., 2016b; Weber et al., 2021; and the references therein). To avoid repetition, this chapter only summarizes these findings and highlights the most recent developments regarding new radiocarbon and stable isotope data, methods of analysis, and their effects on overall results.

As a brief reminder, Shamanka II is located on a narrow peninsula (Mys Shamanka) extending ~600 m into Kultuk Bay in the southwest corner of Lake Baikal, with five small rivers (none longer than ~25 km) discharging into the lake in the vicinity: Sliudianka, Pokhabikha, Talaia, Kultuchnaia, and Medlianka (Fig. 1.1; Fig. 1.2; Fig. 1.3; Fig. 2.1). Excluding the graves documented in the 1960s, for which very little information is available, fieldwork conducted between 1996 and 2019 yielded 97 Early Neolithic (EN) graves, 12 Early Bronze Age (EBA) graves, a single Late Bronze Age grave, and one heavily disturbed grave whose period could not be determined (Bazaliiskii and Weber, 2004; Bazaliiskii and Weber, 2005). In all, the EN graves produced evidence of 156 interments, of which 155 are represented by skeletons ranging from nearly complete to only a few elements and one additional interment evidenced only by sediment staining in the shape of a human body (Burial 98). Typological classification of the EN graves is unambiguous as they clearly belong to the Kitoi mortuary tradition known archaeologically mostly along the Angara River (Bazaliiskii, 2010; Georgievskaia, 1989; Okladnikov, 1950; Okladnikov, 1974; Okladnikov, 1975; Okladnikov, 1976).

The EN graves form a few discernible spatial arrangements (Fig. 2.1). The most obvious are the two groups in the north and south of the cemetery, referred to as the North and South Sectors (the latter also referred to as the S Cluster). The North Sector is further divided into the NW and SE Clusters, the gap between them likely caused by the high bedrock which made the construction of graves somewhat difficult there. Spatially, these two units are not as distinct as the sectors but the distance separating these two clusters appears somewhat greater than between most of the graves within each cluster. Lastly, some graves are arranged into rows, which are defined as a minimum of three graves arranged side-by-side with grave long axes roughly parallel. Graves constructed outside of row formations are referred to as scattered. Thirteen such rows (A to M) have been identified and all but two (Row K and Row L in the South and North Sectors, respectively) run along the NW–SE axis (Fig. 2.1).

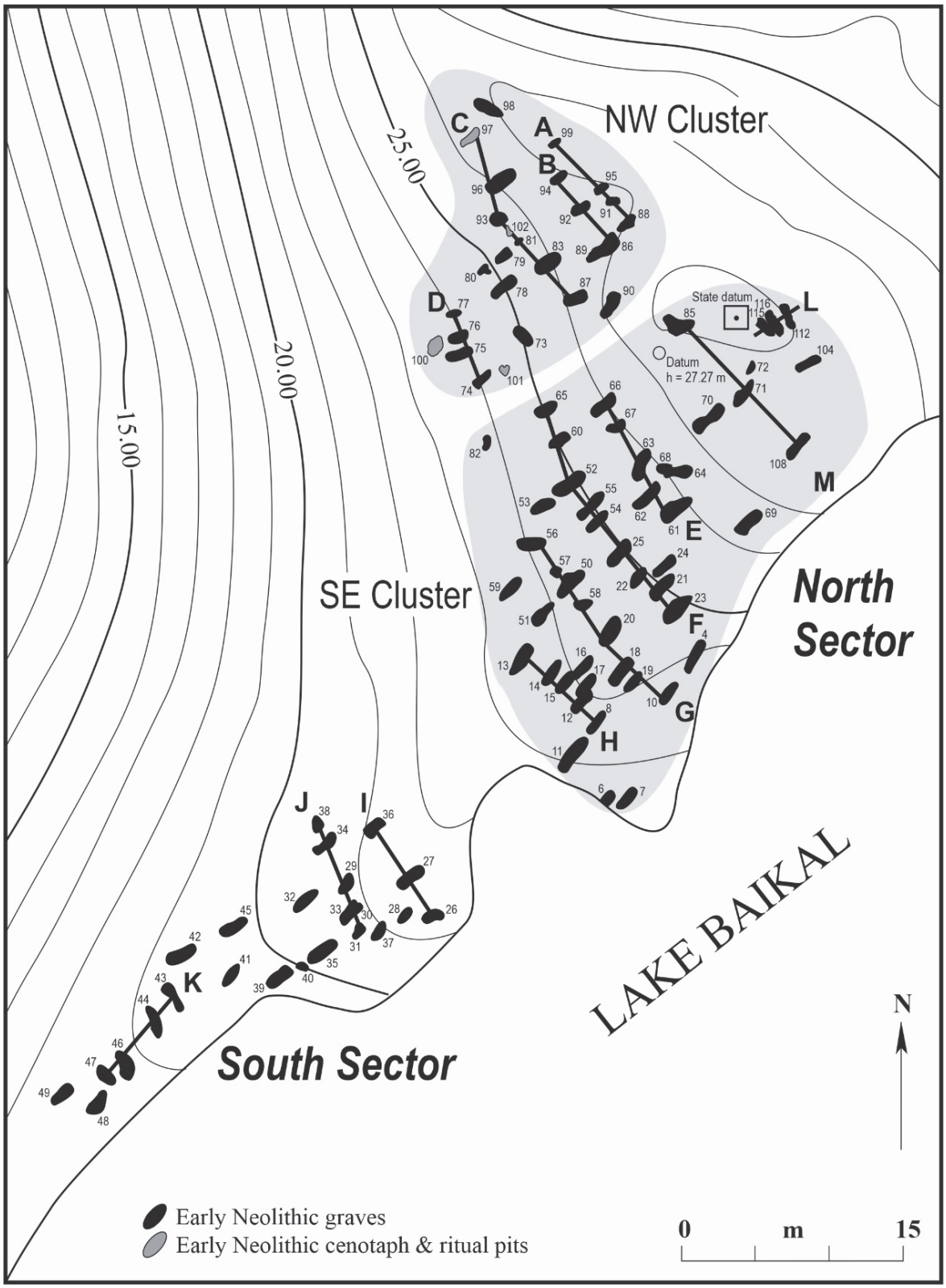


Figure 2.1. Map of the Early Neolithic cemetery of Shamanka II. Figure by chapter author

2. Materials

Compared to the first analysis of Shamanka II chronology and diet (Weber et al., 2016a), the subsequent examination (Weber et al., 2021) differed in the following ways:

1. Biochemical results for several, previously not analyzed, individuals were added to the dataset.
2. Independent stable isotope measurements became available for most of the Shamanka II individuals, replacing the values from radiocarbon dating. Accordingly, the corrected dates, which depend on stable isotope values, sometimes changed by a few years relative to those published in 2016.
3. A new radiocarbon date and isotopic results on micro-samples from a post-weaning tooth portion were obtained for Burial 42.02. Based on the results from bone samples, this individual's diet appeared to be of geographically unknown origin making it impractical to correct the associated date for the freshwater reservoir effect (FRE) using the equation applied to the rest of the Shamanka II cemetery population (Weber et al., 2016a). The new tooth stable isotope values are within the range displayed by the rest of the Shamanka II adults and this made it possible to correct the new tooth date using the associated isotope data and include it in the chronological analysis.[6] See the Addendum for the assessment of the most recent radiocarbon dates and stable isotope results received for Burial 42.02 at the time when this monograph was submitted for publication.
4. The skeletal remains previously identified as Burials 96.01 and 108.02 were considered not to represent separate interments (c.f., Bazaliiskii et al., 2024; Lieverse et al., 2024) and, thus, the associated biochemical data were removed from the dataset.
5. Spatial classification of a few graves also changed:
    a. Graves 70, 71, 72, 85, 104, 108, and 112, located in the northeast part of the cemetery and previously assigned to the NW Cluster, were reclassified — more correctly — as part of the SE Cluster;
    b. After this change, Row B of the NW Cluster consisted only of Graves 86, 92, and 94 (with a total of four burials), while Graves 71, 85, and 108 (also with four burials) were designated as a separate Row M;
    c. Graves 73, 78, and 80 in the NW Cluster were reclassified as scattered because the orientation of Grave 73 is perpendicular to that of the other two and, thus, this arrangement does not meet the criteria for defining a grave row (Fig. 2.1).
6. New radiocarbon dates and stable isotope results were obtained for the EN Lokomotiv cemetery on the Angara River and a few EBA cemeteries in the Little Sea micro-region, substantially expanding the comparative dataset.

In sum, these changes affected burial counts in a few units of analysis but had only minimal impact on the results of the statistical analysis as explained later.

Relative to the most recent studies (Bronk Ramsey et al., 2021; Weber et al., 2021), there are only a few additional changes regarding the material presented in this chapter:

1. At Shamanka II, graves with disarticulated and comingled interments are relatively common making assignment of many skeletal elements to specific individuals rather difficult. Consequently, for Graves 20 and 35 bone samples

[6] However, both tooth and bone stable isotope data for this individual were still excluded from the analysis of dietary patterns.

for laboratory analyses were selected such as to eliminate the risk of duplication and labelled as Burials 20.0A, 20.0B, and 20.0C, and 35.0A. Alas, in all these cases it is still unclear which specific individual in the relevant grave the new samples represent (i.e., 20.01, 20.02 etc.). No skeletal samples were available to be identified positively with Burial 52.02.

2. The three burials from Graves 115 and 116 excavated in 2019 were analyzed and added to the dataset and included in some aspects of the analysis as explained later.
3. Grave 112 (reclassified from scattered to row), together with Graves 115 and 116, now form Row L.
4. For several burials of young children, radiocarbon dates on associated remains of terrestrial fauna were obtained. While these proxy dates help assign these interments to a phase, they are not included in this analysis (c.f., Chapter 3).
5. The most recent dataset of biochemical results for the Shamanka II EN cemetery population is presented in Tables S.2 and S.3. Of 156 identifiable EN Shamanka II individuals only 10 have never been submitted for dating and stable isotope measurements due to the lack of suitable material.

3. Methods

All laboratory techniques of sample processing as well as the methods employed in the analysis of chronology and dietary patterns are described in detail in previous studies (Bronk Ramsey et al., 2021; Weber et al., 2016a; Weber et al., 2016b; Weber et al., 2021). Since relative to the first two examinations (Weber et al., 2016a; Weber et al., 2016b), the structure of the Shamanka II biochemical dataset did change somewhat, the statistical analysis was accordingly updated for the subsequent study (Weber et al., 2021). Updates included correction of conventional radiocarbon dates for the FRE using (in most cases) results from the independent stable isotope measurements, combining dates for burials with more than one date, Bayesian modeling, statistical tests, and graphs. Moreover, there have been a few changes regarding how some aspects of the analysis were implemented:

1. Bayesian modeling of the chronological parameters of cemetery use employed the "Boundary" function in conjunction only with the *Trapezium* distribution model of dated events because it was considered a much more realistic assumption about the history of this particular cemetery than the *Uniform* distribution (Weber et al., 2021).
2. For simplicity, the search for dietary trends carried out in Weber et al., 2021 reported only results from Pearson Product-moment Correlation coefficients (PCC) between mean calibrated radiocarbon dates (i.e., unmodelled) and $\delta^{13}C$ and $\delta^{15}N$ measurements obtained from the same samples of human skeletal remains. This chapter continues this practice.
3. New to the analysis was the use of the "KDE_Model" (Kernel Density Estimate) function, which allows detection of any patterns in the distribution of dated events (i.e., burials) between the *Start* and *End* boundaries (Bronk Ramsey et al., 2021). This function was applied to all Middle Holocene cemeteries in Cis-Baikal with a sufficient number of radiocarbon-dated burials grouped in a few different ways (e.g., by mortuary tradition, micro-region, etc.) and to several large cemeteries with detailed spatial location data for each grave to provide additional insights about the development and history of these cemeteries.

For the purpose of this monograph, Bayesian analysis of the chronological parameters of cemetery use was not rerun with the two new dates now available for the adult burials from Graves 115 and 116, both belonging to Phase 1, because the addition of these dates to the model would not alter results in a manner significant enough to necessitate reanalysis. However, the graphic aspect of the "KDE_Model" analysis was implemented with these two new dates to show how Graves 115 and 116 fit into the history of Shamanka II.

Lastly, it is important to note that the "Boundary" and "KDE_Model" functions provide complementary insights about the history of a prehistoric phenomenon under examination. The "Boundary" function generates a range of chronometric parameters to define boundaries and durations of relevant units of analysis (e.g., Shamanka II cemetery), while the "KDE_Model" function provides information about the distribution of the dated events at and between the boundaries (c.f., Bronk Ramsey, 2017; Bronk Ramsey et al., 2021).

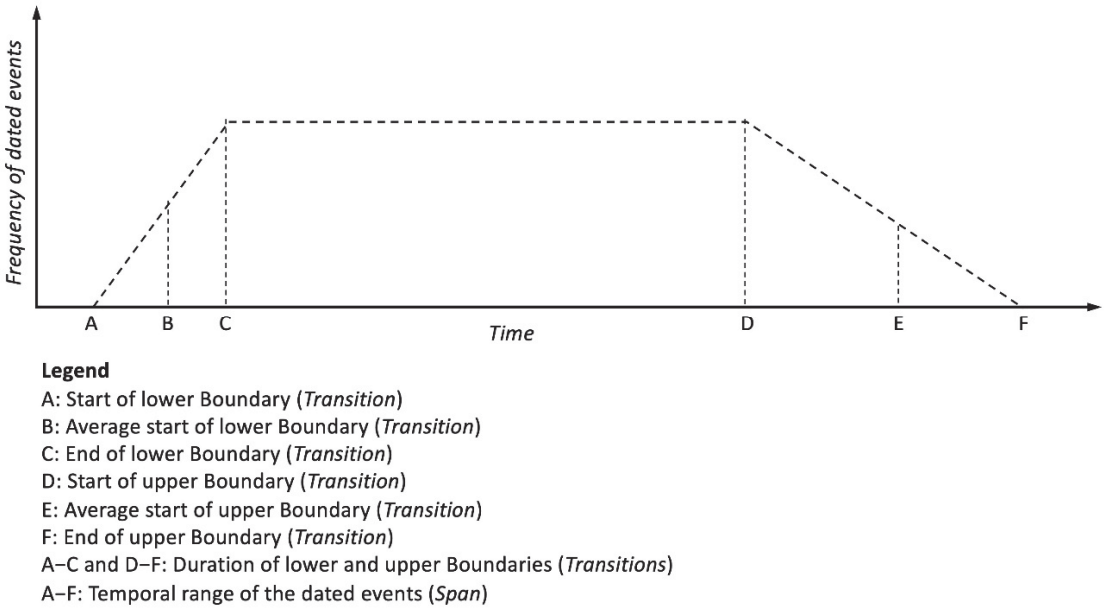


Figure 2.2. Explanation of the chronological terms generated by the Bayesian analysis of radiocarbon dates. Figure by chapter author

4. General chronology

Table 2.1 is a summary of the Bayesian modelling results for Shamanka II using the "Boundary" function in conjunction with the *Trapezium* distribution model. Results for the Lokomotiv cemetery and the rest of the radiocarbon-dated Kitoi burials in the Angara valley are included for comparison.[7] The chronological terms presented in the table are explained in Fig. 2.2. Visual comparison between Shamanka II chronology and the other relevant groups of dated burials is facilitated by the "KDE_Model" function. Fig. 2.3 shows the chronological positions of the two Kitoi micro-regional groups — SW Baikal and the Angara valley — relative to one another and to the Khin' mortuary groups in the

[7] Complete results at the 68.2% and 95.4% probability intervals are presented in Weber et al., 2021: Table 5.

Angara, Little Sea, and Upper Lena micro-regions.[8] The chronological positions of all sufficiently dated Kitoi cemeteries are presented in Fig. 2.4 while Table 2.2 is a summary of the current chronology of Middle Holocene culture history in Cis-Baikal (Weber et al., 2021).

Table 2.1. Summary of Bayesian chronological modelling for Early Neolithic Shamanka II, Lokomotiv, and the Angara valley (for details, see Weber et al., 2021). Dates for Burials 115.01 and 116 are not included in the Shamanka II dataset. All dates are mean modelled highest posterior distribution (HPD) cal. BP

Chronological terms	Shamanka Phase 1 n = 103 $\mu\pm\sigma$	Lokomotiv n = 80 $\mu\pm\sigma$	Angara excl. Lokomotiv n = 25 $\mu\pm\sigma$	Shamanka Phase 2 n = 17 $\mu\pm\sigma$
Lower Phase Boundary				
Average Start	7507±21	7501±26	7343±81	6811±45
Start	7555±40	7542±39	7518±97	6831±59
End	7460±48	7461±52	7167±159	6792±42
Transition	95±78	82±76	351±207	40±51
Upper Phase Boundary				
Average End	7224±31	7101±44	6832±59	6711±45
Start	7297±80	7199±110	6906±94	6731±42
End	7152±41	7004±73	6757±83	6691±61
Transition	145±111	194±166	149±134	40±53
Span of Phase	363±47	480±67	604±84	104±78

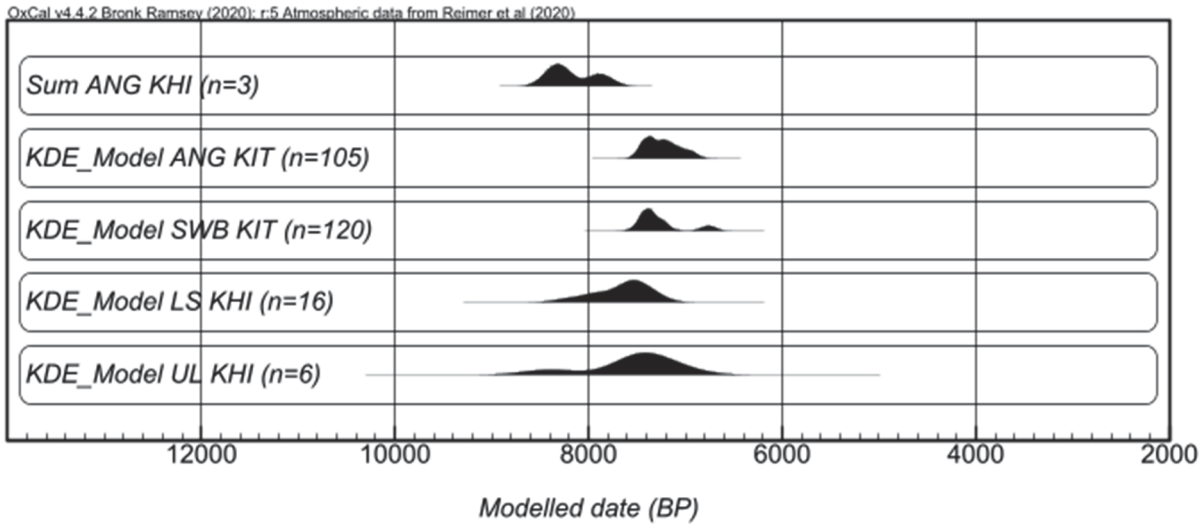


Figure 2.3. Chronology of the Khin and Kitoi mortuary traditions in Cis-Baikal (after Bronk Ramsey et al., 2021: Fig. 9). Dates for Burials 115.01 and 116 are not included in the Shamanka II dataset. Figure by chapter author

[8] To date, Shamanka II is the only Kitoi cemetery documented in SW Baikal and no graves of the Khin' mortuary tradition have been found in this micro-region.

Table 2.2. Summary of Bayesian chronological modelling of Cis-Baikal Middle Holocene culture history (for details, see Weber et al., 2021). All dates are modelled. *Defined indirectly by the upper and lower boundaries calculated for the Kitoi and Isakovo–Serovo datasets, respectively

Period	HPD cal. BP
Late Mesolithic	8630–7560
Early Neolithic	7560–6660
Middle Neolithic *	6660–6060
Late Neolithic	6050–4970
Early Bronze Age	4970–3470

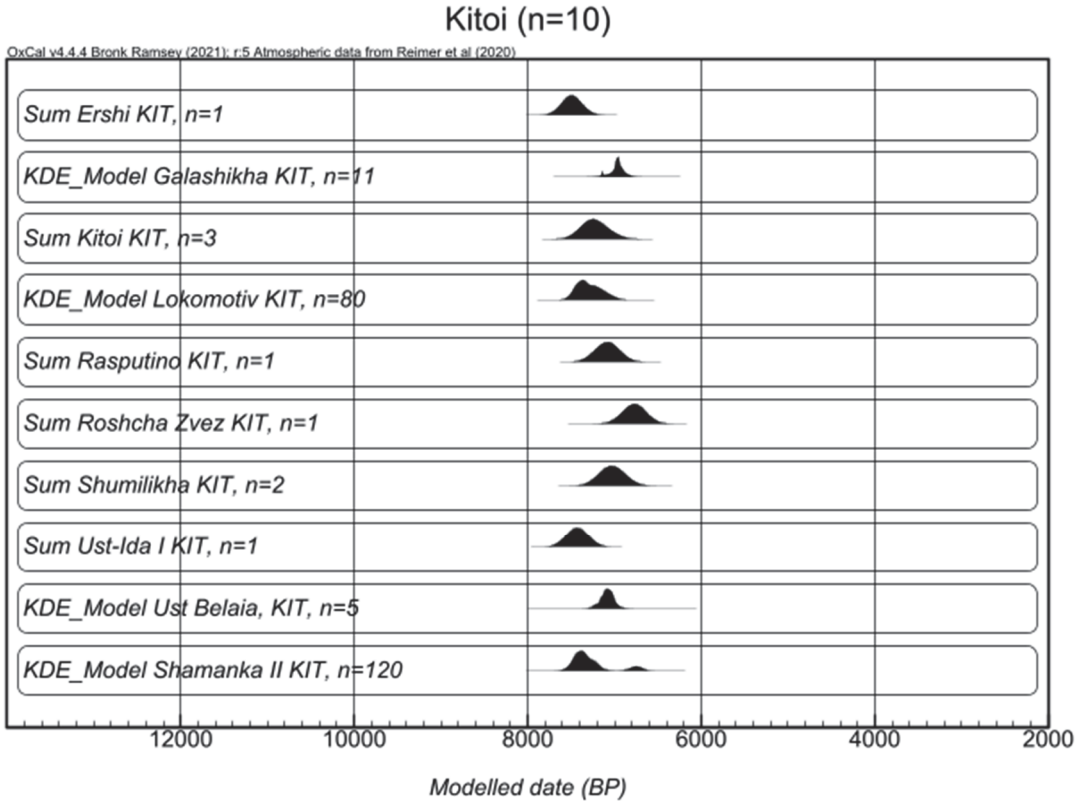


Figure 2.4. Chronology of Kitoi cemeteries (sorted alphabetically by name) on the Angara and SW Baikal (after Bronk Ramsey et al., 2021: Fig. 9). Dates for Burials 115.01 and 116 are not included in the Shamanka II dataset. Figure by chapter author

The corrected EN ^{14}C dates from Shamanka II range from 6911±73 years BP (SHA_2005.025.03) to 5777±74 years BP (SHA_2005.026.03) (Table S.2; Table S.3). The Shamanka II sequence generally parallels the Kitoi mortuary tradition in the Angara valley, including Lokomotiv, the largest cemetery there. However, while both start around the same time, the Shamanka II sequence appears to end a good 3–4 centuries later than on the Angara and particularly later than the Lokomotiv cemetery (Table 2.1; Fig. 2.4; Fig. 2.5). The difference regarding the upper boundary of the Kitoi mortuary tradition in these two areas is quite large and its meaning is addressed briefly in Chapter 8 and in more detail elsewhere (Weber, 2020; Weber, 2023).

The temporal distribution of the corrected dates (Table S.2; Table S.3) shows a gap of 114 years between 6155±74 BP (SHA_2001.012) and 6041±52 BP (SHA_2004.049), dividing the Shamanka II cemetery into two chronological groups: Phase 1 with 122 dated interments and Phase 2 with 17. Bayesian analysis of the upper boundary of Phase 1 and

the lower boundary of Phase 2 suggests that, at the maximum, the gap may be as long as four centuries (Table 2.1). The analysis also shows a much longer duration of Phase 1 (*363±47* y.) relative to Phase 2 (*104±78* y.).[9] Transitions also differ. The lower boundary transition for Phase 1 (*95±78* y.) appears to be shorter than its upper boundary transition (*145±111* y.) while both transitions for Phase 2 are about the same (*~40* y.) and much more abrupt than either transition for Phase 1.

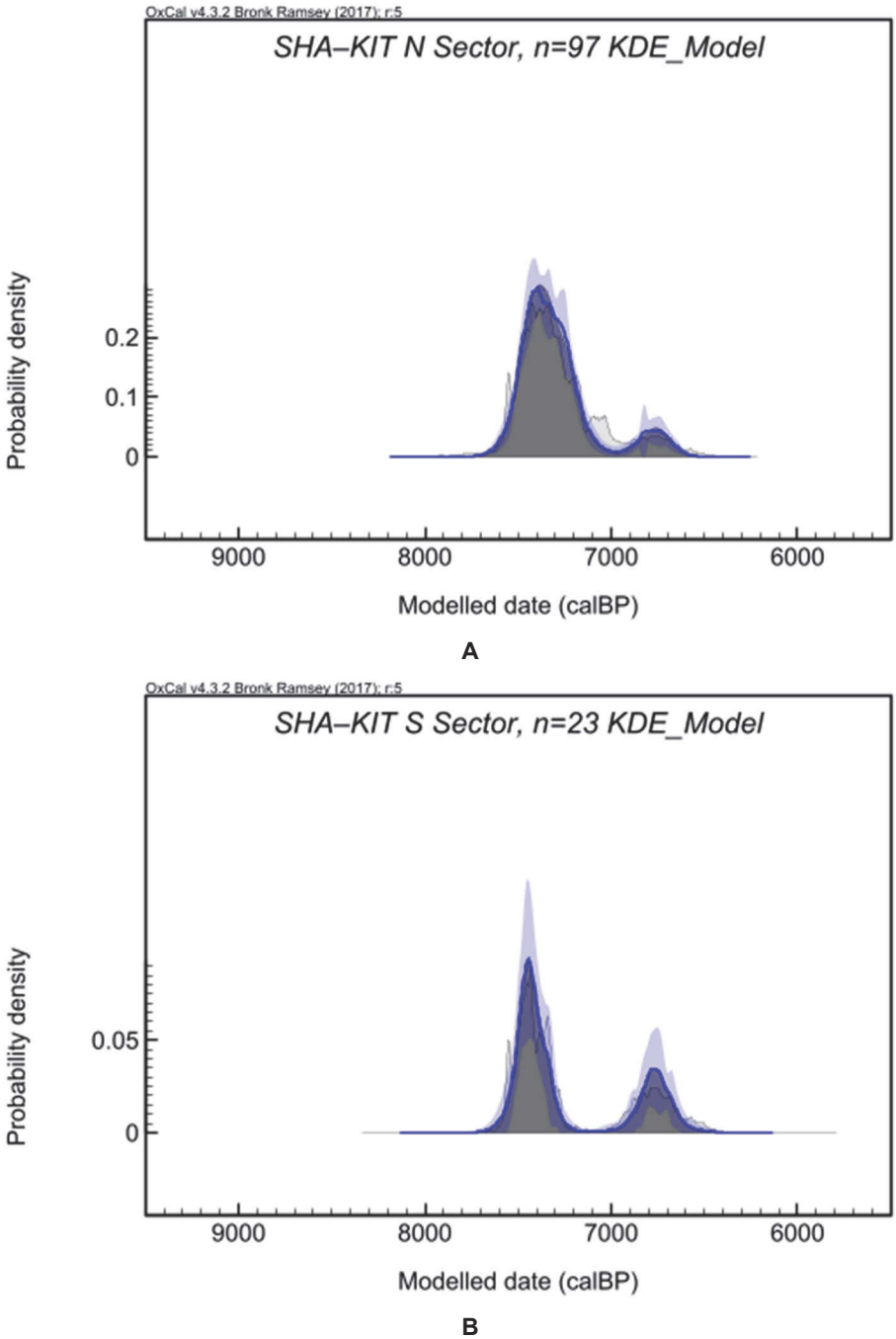


Figure 2.5. Density plots for the Shamanka II cemetery: Dates for Burials 115.01 and 116 are not included. Figure by chapter author:

A. Shamanka II, North Sector
B. Shamanka II, South Sector

[9] Italics indicate modelled dates.

5. Spatial patterns of cemetery use

The presence of two unambiguous phases separated by a gap in cemetery use within the same mortuary tradition (Weber et al., 2016a) makes Shamanka II unique on the regional scale (Fig. 2.3; Fig. 2.4). This chronological structure and the three clusters generate five units of analysis. Development of the Shamanka II cemetery, another product of the "KDE_Model" analysis, is presented in Fig. 2.6. Interestingly, the phases show chronological structures that somewhat differ from one another.

Phase 1

The first graves appeared roughly around the same time in both clusters of the North Sector and in the South Sector of the cemetery (Fig. 2.5; Fig. 2.6). Some of these early graves seem to mark the start of a row, which then expanded in both directions, but some graves remained scattered until the end of the cemetery's EN use. All rows were established during this phase including the two rows with the different orientation, which are located at opposing ends of the cemetery. However, Row K was established much earlier than Row L and also has one burial interred during Phase 2 (Table S.2; Table S.3; Fig. 2.6). Early growth of the cemetery occurred in all three spatial groups but late Phase 1 growth took place predominantly within the SE Cluster, where most graves are arranged into rows and the burials show the main dietary trend documented for this cemetery — an increase in the consumption of local fish (c.f., Section 6; Table 2.3). This pattern suggests that the distinction between the NW and SE Clusters may not be as dependent on topographic criteria only as it first appears. Likewise, the number of graves and burials — particularly within the SE Cluster — seems high enough to fill the gap of ~15 m, which separates the North and South Sectors, indicating that the sectors were meant to be spatially separate from one another from the time they were established and to remain separated throughout the cemetery's use.

Table 2.3. Summary of Pearson product-moment correlation (PCC) analysis for the Shamanka II and Lokomotiv cemetery populations (after Weber et al., 2021). Only units of analysis showing at least one statistically significant correlation are included. SHA Burial 42.02 is excluded from analysis. Legend: Date = Mean calibrated date BP; **Correlation is significant at the 0.01 level (2-tailed)

No.	Unit of analysis		PCC	$\delta^{13}C$	$\delta^{15}N$	Trend description	Fig.
1	Shamanka II, Phase 1, SE Cluster, row burials: Group 2	Date	r	–0.328	–0.827**	Increasing consumption of local shallow water Kultuk Bay fishes and, perhaps, some Baikal seal.	Fig. 2.8.A
			Sig. (2-tailed)	0.019	0.000		
			N	51	51		
			R^2 Linear		0.684		
2	Shamanka II, Phase 1, N Sector scattered burials: Group 3	Date	r	0.780**	–0.038	Increasing consumption of local Kultuk Bay fishes and, perhaps, some Baikal seal.	
			Sig. (2-tailed)	0.000	0.876		
			N	19	19		
			R^2 Linear	0.608			
3	Shamanka II, Phase 1, SE Cluster scattered burials: Group 3	Date	r	0.773**	–0.108	Increasing consumption of local Kultuk Bay fishes.	Fig. 2.8.B
			Sig. (2-tailed)	0.000	0.679		
			N	17	17		
			R^2 Linear	0.598			
4	Shamanka II, Phase 1, S Sector scattered burials: Group 4	Date	r	–0.631	–0.862	Increasing consumption of local inshore fishes and, perhaps, some Baikal seal.	
			Sig. (2-tailed)	0.254	0.061		
			N	5	5		
			R^2 Linear		0.743		

No.	Unit of analysis		PCC	$\delta^{13}C$	$\delta^{15}N$	Trend description	Fig.
5	Shamanka II, Phase 2: Group 5	Date	r Sig. (2-tailed) N R^2 Linear	–0.198 0.447 17	–0.886** 0.000 17 0.785	Increasing consumption of local shallow water Kultuk Bay fishes and, perhaps, some Baikal seal.	Fig. 2.8.C
6	Lokomotiv, Clusters 2, 4, and 5	Date	r Sig. (2-tailed) N R^2 Linear	–0.276 0.045 53	–0.648** 0.000 53 0.420	Increasing consumption of local upper Angara fishes.	Fig. 2.8.D

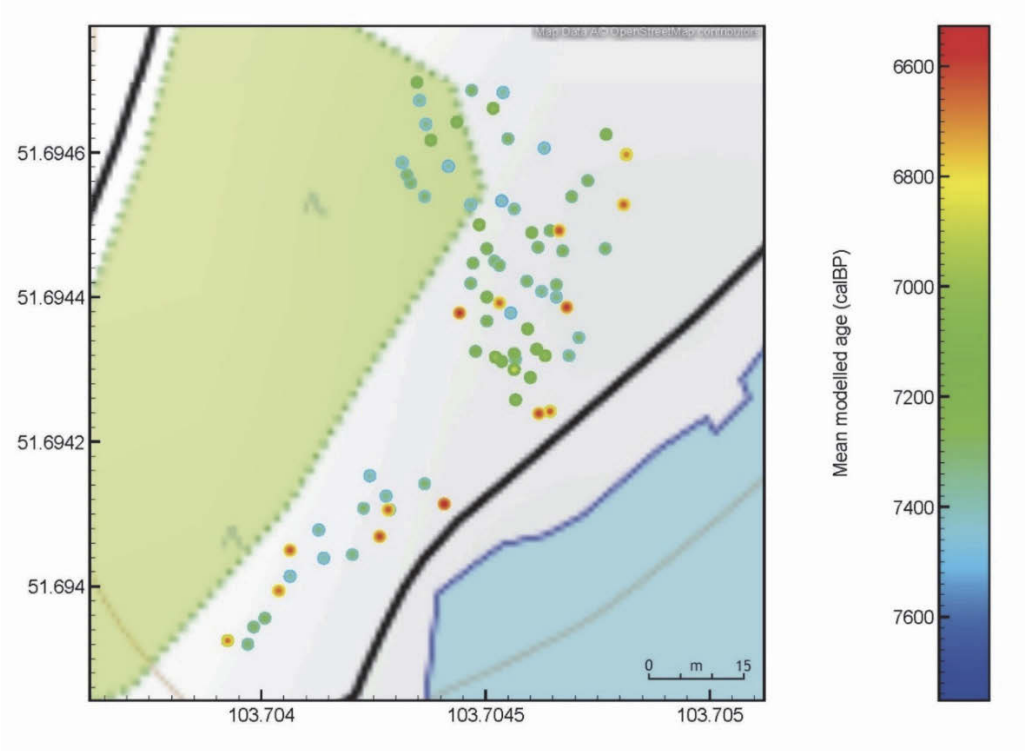


Figure 2.6. Development of the Shamanka II cemetery on SW Baikal: Results from Kernel Density Estimate modeling (after Bronk Ramsey et al., 2021: Fig. 15). Dates for Burials 115.01 and 116 are included in the Shamanka II dataset. The map is the final product of the spatio-chronological simulation using the "KDE_Model" function with geographic coordinates for each examined grave and burial. Therefore, not all dated burials are visible on the final map because for graves with multiple interments, the marker for the burial with the youngest date covers markers for the older ones. However, all burials, including those hidden underneath younger ones, are visible while the simulation is running. The simulation can be stopped at any time to generate graphic outputs for particularly critical times such as onset, peak, change in tempo or end of burial activity (Bronk Ramsey et al., 2021). See Fig. 2.5 for density plots. Figure by chapter author

Phase 2

After a gap lasting a maximum of a few centuries (Table 2.1; Table S.2), new burials were interred mainly in the South Sector and in the SE Cluster of the North Sector (Fig. 2.6).[10] New burials were added at about the same frequency across these two units, resulting in a more equitable spatial distribution of Phase 2 burials between the sectors relative to Phase 1, when the SE Cluster was the centre of burial activities. While some graves were scattered, others were integrated into rows established in Phase 1 (Rows A, J, and M).[11] No new rows were formed during Phase 2. In several cases, both scattered (e.g., Gr. 42 and 59) and row graves (e.g., Gr. 23, 26, 44, 50, and 56) built during Phase 1 were reopened and new burials were added. Indeed, with the exception of Burial 30 (Row J), interred in a single-burial grave, the remaining six Phase 2 row burials were all placed in graves already established in Phase 1 (Fig. 2.6; Table S.2). Since there are no rows consisting entirely of Phase 2 graves, this suggests that the mortuary activities of Phase 2 followed the spatial patterns of cemetery use established in Phase 1, further implying a substantial degree of mortuary continuity. Still, given the length of the gap between the two phases, the matter of real or perceived relationships between the Phase 2 individuals (particularly those added to existing rows or graves) and the Phase 1 individuals is an important one and merits dedicated examination. Moreover, the dietary trend of Phase 2 burials (n = 17) repeats very closely the main trend from Phase 1 that characterized row burials from the SE Cluster (c.f., Section 6).

6. Diet of the Early Neolithic Shamanka II people

Assessment of the diet of the Shamanka II cemetery population is facilitated by the carbon and nitrogen stable isotope measurements obtained on the same bone samples that were used for radiocarbon dating. Analysis begins with a comparison with the results available for Kitoi groups from the Angara valley and with EBA groups from the Little Sea micro-region, the latter limited to the diet described as Game-Fish-Seal (GFS) (Weber and Bettinger, 2010; Weber and Goriunova, 2013). Comparison with other examined Kitoi individuals, including the Lokomotiv cemetery, is a logical starting place, while inclusion of the EBA individuals from the Little Sea with the GFS diet in the comparison is appropriate because they represent the only other hunter-gatherers living on a diet with a substantial component of aquatic foods from Lake Baikal and, moreover, the sample size is equally large (Weber et al., 2021).

Thus, graphically, the Shamanka II dataset of isotopic measurements occupies the space between the Kitoi individuals from the Angara valley, which display somewhat higher $\delta^{13}C$ values, and the EBA foragers with the GFS diet from the Little Sea, which show somewhat lower $\delta^{13}C$ measurements (Fig. 2.7). Although the distribution of Shamanka II $\delta^{13}C$ values overlaps slightly with the other two distributions, the differences between them are nevertheless statistically significant, while the $\delta^{15}N$ signatures are

[10] Presently, there are no interments from the NW sector directly radiocarbon-dated to Phase 2. One burial, the 9–18 m. old infant in Grave 91, was assigned to Phase 2 using the calculations described in Chapter 3. It is possible that burials in Grave 98 (adolescent–adult) and Grave 99 (2–4 y. old child), not dated because of a lack of suitable skeletal remains, also belong to Phase 2. Even if both of these burials were interred during Phase 2, there still would be only very few of them in the NW sector.

[11] Burial 91 of a 9–18 m. old child dates indirectly to Phase 2 (Fig. 2.1; Table S.3), however, it is not included in the "KDE_Model" simulation because its radiocarbon date cannot be corrected for the FRE.

statistically the same (Weber et al., 2016a). This implies that at the population level, the main vector of difference between these three samples is not in the quantity of the aquatic contribution to dietary protein (reflected in $\delta^{15}N$) but rather in its kind, which is quite variable along the $\delta^{13}C$ scale. This variation largely depends (directly) on the rates of photosynthesis and (indirectly) on the bathymetry characterizing the local aquatic habitat (Weber et al., 2011; Yoshii et al., 1999).

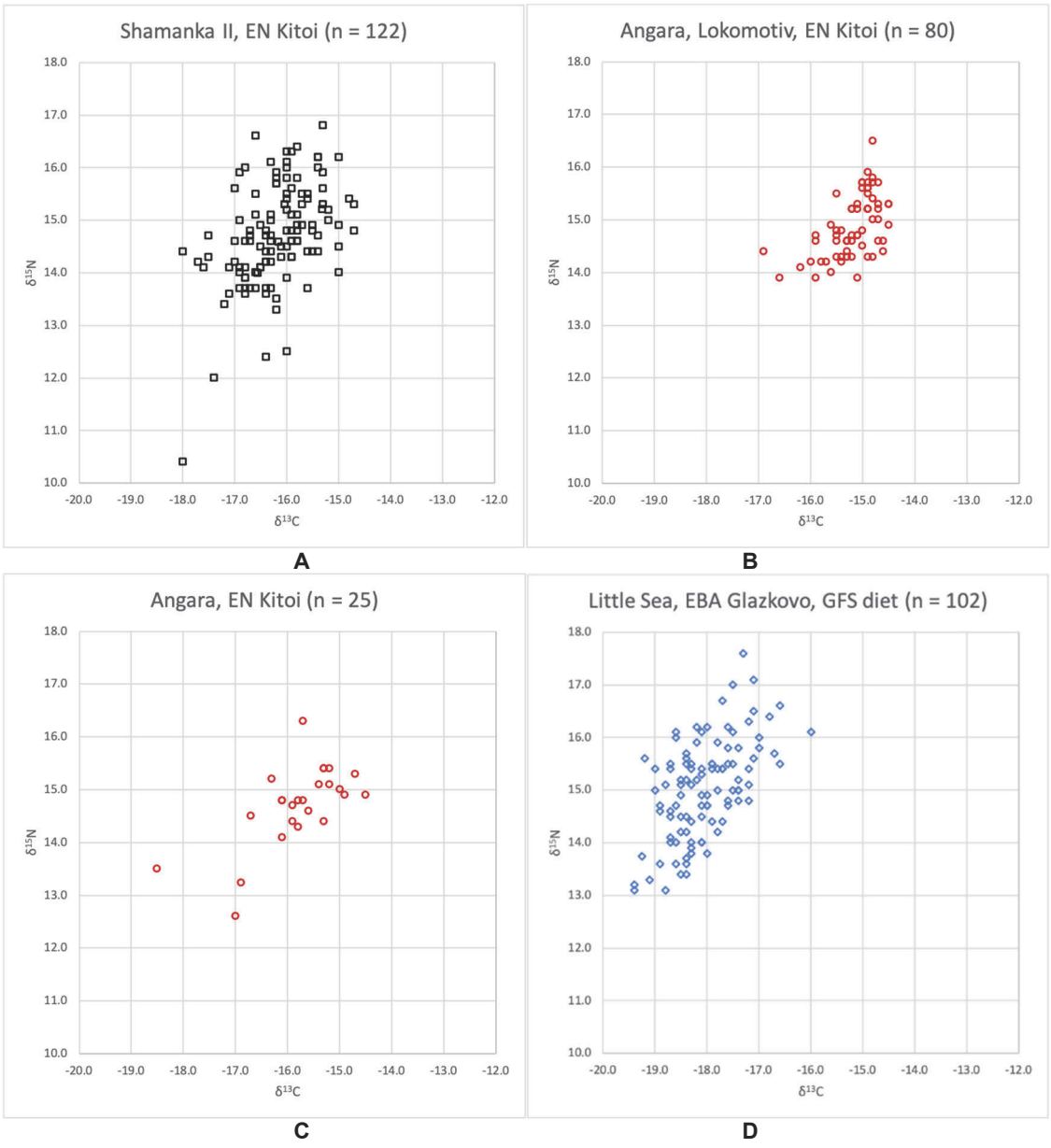


Figure 2.7. Stable isotope results for Early Neolithic Shamanka II, Early Neolithic Angara valley, and the Early Bronze Age Game-Fish-Seal dietary group from the Little Sea micro-region (based on data from Weber et al. 2021 with results for Burials 115.01 and 116 included in the Shamanka II dataset). Burial 42.02 from Shamanka II is represented by results from bone samples (Supplement 2). Figure by chapter author:

A. Shamanka II
B. Lokomotiv
C. Angara, Kitoi
D. Little Sea, EBA, Glazkovo, GFS diet

Also, the distribution ranges for the EBA GFS dietary group from the Little Sea and Shamanka II (excluding Burial 42.02 with its abnormally low bone $\delta^{15}N$ value of 10.5‰; Table S.3) are generally similar while the EN Angara sample, with only three individuals showing unusually low isotopic values (Fig. 2.7.C), displays a more clustered distribution. This is interesting because the Angara sample comprises several sites separated by a distance of up to ~250 km while SW Baikal is represented by only one cemetery. It is useful, then, to consider the sources and causes of dietary variation at Shamanka II in more detail.

Since the contribution of plant foods to the diets of middle Holocene hunter-gatherers in the Baikal region appears to have been minimal (Katzenberg and Weber, 1999; Katzenberg et al., 2010; Weber et al., 2002; Weber et al., 2011) and since terrestrial herbivores in the Baikal region show limited variation in their bone collagen $\delta^{13}C$ and $\delta^{15}N$ ratios (Weber et al., 2011: Tables 2 and 3), it is clear that the pattern of individual variation at Shamanka II is best explained in terms of the variable consumption of freshwater foods, a situation similar to that of EBA groups in the Little Sea micro-region (Weber and Goriunova, 2013; Weber et al., 2011). In this part of the Baikal region, there are three relevant groups of freshwater resources. The first includes various Baikal fishes and the lake's endemic seal, which together cover a wide range in $\delta^{13}C$ and $\delta^{15}N$ values, from about –25‰ to –10‰ and 10‰ to 16‰, respectively (Weber et al., 2011: Table 5).

The second group are fishes from the small and medium-sized immature rivers, which are expected to show limited variation in $\delta^{13}C$ signals similar to the values documented on the Upper Lena (approximately from –27‰ to –24‰; Weber et al., 2011: Table 5). The third group comprises the fishes of the Angara River. Unfortunately, due to the three dams built between Baikal and Bratsk in the mid-twentieth century, which irreversibly altered Angara's ecology and destroyed its fishery, there are no useful modern fish stable isotope data available for this ecosystem. Measurements on archaeological specimens are likewise lacking, however, based on our understanding of the region's stable isotope ecology, we expect $\delta^{13}C$ values there to be much higher than on the Upper Lena but not as high as in the shallows of Lake Baikal.[12] The $\delta^{15}N$ values of the riverine fishes should be similar to those in the Baikal system, though perhaps without the full range of trophic levels, not least because the seal — the top predator in Lake Baikal — does not enter the rivers.

It is expected, at least hypothetically, that the people from Shamanka II could have had access to all three groups of freshwater food resources (the most distant being the Angara, some 75 km to the northeast). The next question to ask, then, is about aspects of human behaviour that would account for the observed isotopic variation. For example, extensive sharing, equal access to different kinds of fisheries, similar fishing techniques, and mobility throughout roughly the same area over extended time intervals would be expected to result in limited stable isotope variation, which is not what we see in the Shamanka II dataset. Thus, it is useful to consider the Baikal fishery in a little more detail.

The matter regards the relative contribution of the four more specific kinds of aquatic food from the lake: (1) the shallow water cove-and-lagoon fishes (e.g., roach, dace, ide, perch, and pike); (2) open coast and gulf species (e.g., black and white graylings, lenok, and whitefish); (3) the pelagic omul; and (4) the Baikal seal. A previous analysis concluded that in the Baikal waters around Shamanka II, the fishes were expected to show "a less variable $\delta^{13}C$ signal than the more diverse bathymetry of the Little Sea" and that it

[12] Analyses on prehistoric specimens from the following sites are in progress: Ityrkhei, Sagan-Nuge, Ulan-Khada (Little Sea), Shamanka II (Southwest Baikal), Ostrov Listvenichnyi, Sosnovyi Mys (Lower Angara), and Abakshino (Ilim R.)

was the consumption of seal that best accounted for the wide range of $\delta^{13}C$ measurements in the Shamanka II humans (Weber et al., 2011: 242). However, not fully appreciated at the time was the fact that in the open shallows of Kultuk Bay, one would actually expect a mix of fishes from all three coastal habitats of Lake Baikal — shallow cove-and-lagoon (<5 m), littoral (5–20 m), and sub-littoral (>20 m) — transitioning gradually from one to the other (Weber et al., 2002: Table 1). Considered together, these fishes cover a range of about 10‰ in bone collagen $\delta^{13}C$ values from roughly −20‰ to −10‰ (Weber et al., 2011). Although the work conducted on archaeofauna from campsites in the Little Sea micro-region (Losey et al., 2008; Nomokonova et al., 2011; Nomokonova et al., 2015) indicates that middle Holocene hunter-gatherers lacked the capacity for fishing the open waters of Baikal, one should not rule out at least some dietary contribution from gulf and pelagic fishes. While the inshore shallows are not its preferred habitat, it is not entirely unlikely that the omul' (with $\delta^{13}C$ values in the –25.0‰ to –22.0‰ range, thus about 2‰ even more negative than the Baikal seal; Weber et al., 2011: Table 5), for example, could have been harvested there in small numbers during the colder seasons (spring and autumn or perhaps even winter) along with the other species. Moreover, further away from the shore, Baikal seal with $\delta^{13}C$ measurements around −22‰ would have been available in winter and spring (Nomokonova et al., 2015; Weber et al., 1998). All these resources considered together cover a wide range of $\delta^{13}C$ values from –25.0‰ to –10.0‰.

However, in order for this ecological variation to be reflected in human isotopic values, some kind of sorting mechanism(s) would have had to be in place, such as differential use of fishing techniques, differential access to resources, or differential sharing once food was acquired. While such differential access to (and sharing of) food resources is, of course, a possibility, a more parsimonious explanation is that different groups in the Shamanka II cemetery population used different fishing techniques (Lindström, 1996; Weber, 2020; see also Chapter 7). It is also possible that those buried at Shamanka II constitute a more heterogeneous group in terms of their places of origin, and hence their access to aquatic foods, than the Angara groups which all harvested essentially the same fishery. No associated large EN campsite has been found on the peninsula on which Shamanka II is located, nor have any such sites been found in the surrounding area. This is not to say, of course, that such campsites did not exist, only that the presently available evidence suggests that the cemetery may have been used by a range of surrounding groups (c.f., Chapter 8).

Lastly, no statistically significant differences were found in the comparison between females and males in any of the main spatial units, or between burials from rows vs. scattered graves, including between the SE Cluster's row burials and the North Sector's scattered burials. However, some of these comparisons look very differently when the chronological dimension is included in the analysis, as discussed next.

7. Dietary trends among the Early Neolithic Shamanka II people

The search for dietary trends within the Shamanka II cemetery population is facilitated by the availability of a radiocarbon date associated with carbon and nitrogen stable isotope values for every burial represented by at least some skeletal remains identifiable to a particular individual. Children younger than 5 years old are excluded from this analysis because their dates cannot be corrected for the FRE due to the breastfeeding effect. Burial 42.02 is also excluded because the bone (adult) stable isotope values clearly show a diet of very different geographic origin, making the correction of the associated radiocarbon date impractical (Weber et al., 2016a; Weber et al., 2021; see also the Addendum).

Since the recent changes to the Shamanka II dataset, relative to the results examined in Weber et al., 2021, are minor, there is no need to run the entire PCC analysis again. More specifically, only the designation of Graves 112, 115, and 116 as Row L is new in the current dataset. This means that the single burial from Grave 112 has been reclassified as a "Row" burial, reducing the number of burials in the group of "Scattered" burials from the North Sector by one. The new Row L is not included in the group of SE Cluster row graves because of its different orientation and, consisting of only three adult individuals, is too small for statistical analysis on its own. Therefore, it is sufficient here to summarize the findings from the Weber et al., 2021 study.[13]

In the first step of the PCC analysis, two chronological groups of burials were identified and examined: Phase 1 and Phase 2. Calculating PCC for these two groups showed a strong and statistically significant negative correlation within Phase 1 between mean calibrated radiocarbon dates and nitrogen stable isotope values ($\delta^{15}N$, $r = -0.581$, $p < 0.000$, n = 105; Weber et al., 2016a) and an even stronger negative correlation within Phase 2 ($\delta^{15}N$ $r = -0.886$, $p < 0.000$, n = 17; Table 2.3). Next, Phase 1 burials were divided further: first by spatial group (NW and SE Clusters, and South Sector) and then by formation (Row vs. Scattered).

This revealed two additional strong and statistically significant dietary trends: one for the row burials from the SE Cluster — negative correlation between radiocarbon dates and nitrogen stable isotope values; and another for scattered burials from the entire North Sector — negative correlation between radiocarbon dates and carbon stable isotope values (Fig. 2.8; Table 2.3):

- Row burials from the SE Cluster: $\delta^{15}N$, $r = -0.827$, $p = 0.000$, n = 51; and
- Scattered burials from the entire North Sector: $\delta^{13}C$, $r = -0.780$, $p = 0.000$, n = 19.

Moreover, a trend was also found among the scattered burials from the South Sector ($\delta^{15}N$, $r = -0.862$, $p = 0.061$, n = 5), which marginally missed the 0.05% statistical significance level, quite likely, because of the small sample size as the correlation coefficient is high. The remaining individuals dating to Phase 1, that is, burials from the row graves in the NW Cluster and the South Sector, showed no statistically significant association between the examined variables, whether analyzed together or separately.

[13] As explained earlier, the differences between the dataset used in the first (Weber et al., 2016a) and second (Weber et al., 2021) studies were also rather minor. Consequently, the findings from the PCC analyses of dietary trends were consistent in both cases.

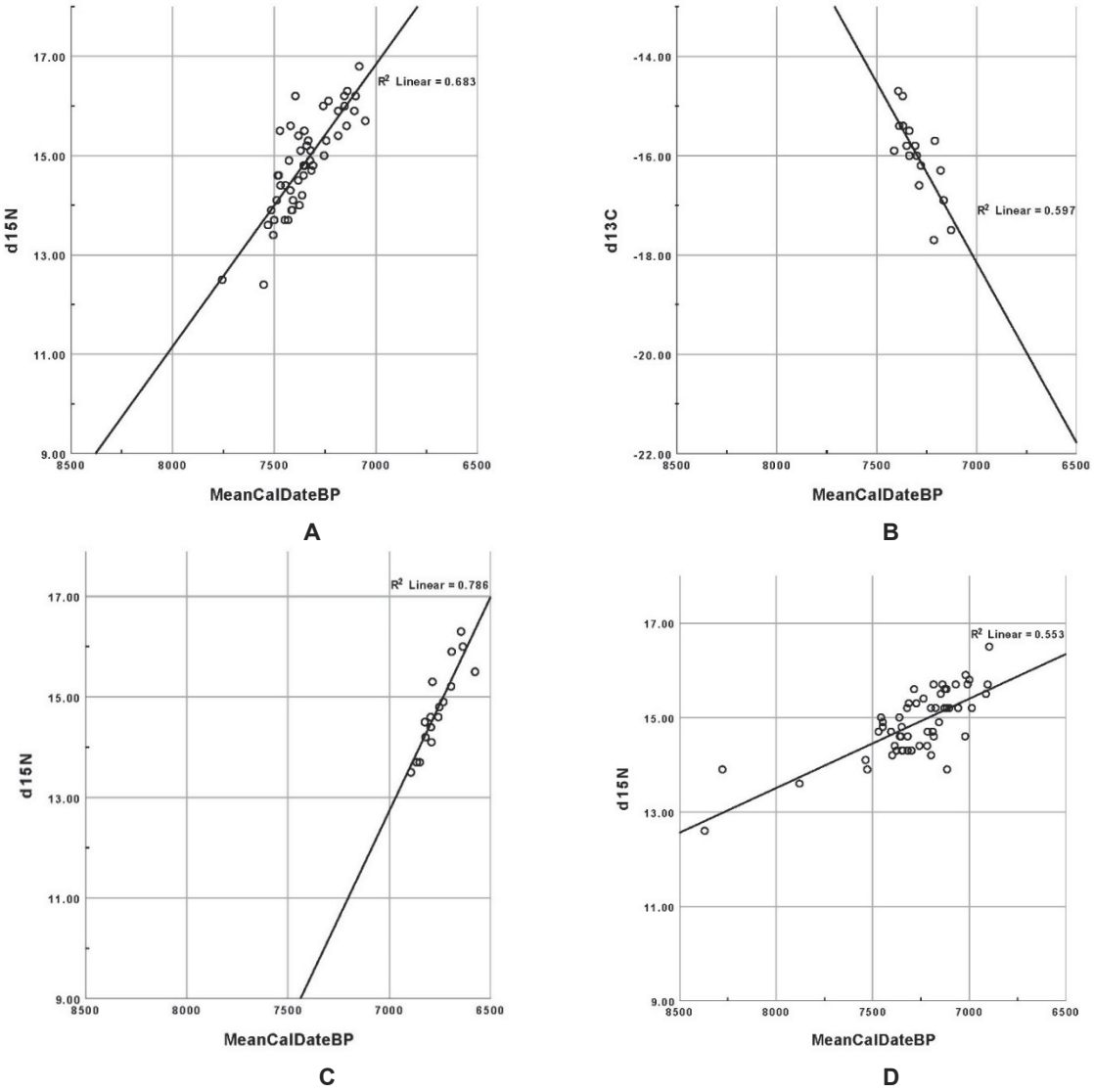


Figure 2.8. Dietary trends for Late Mesolithic and Early Neolithic hunter-gatherer groups on SW Baikal and in the Angara valley (after Weber et al., 2021: Fig. 3, Fig. S2). Figure by chapter author:

A. Shamanka II, Phase 1, SE Cluster, row burials (Group 2): Mean cal. BP dates by δ15N
B. Shamanka II, Phase 1, SE Cluster, scattered burials (Group 3): Mean cal. BP dates by δ13C
C. Shamanka II, Phase 2 (Group 5): Mean cal. BP dates by δ15N
D. Khin (n = 3) and Kitoi (Lokomotiv Cluster 2, 4, and 5; n =50) burials, Angara: Mean cal. BP dates by δ15N

Overall, taking into consideration the chronological dimension, there appear to be six dietary groups within the Shamanka II cemetery population. The first five coexisted with one another during Phase 1, three of which experienced changes in diet over time, and the sixth group belongs to Phase 2 which shows a dietary trend too.

- **Group 1** comprises all Phase 1 individuals interred in row graves in the NW Cluster and South Sector of the cemetery and shows no evidence of a dietary shift over time. This unit can be further split into Group 1A for the NW Cluster and Group 1B for the South Cluster, neither of which shows a dietary trend.
- **Group 2** comprises all Phase 1 burials interred in graves arranged into rows in the SE Cluster. The dietary trend of this group shows an increased

consumption over time of local shallow water Kultuk Bay fishes and, perhaps, some Baikal seal.

- **Group 2–L** (i.e., Row L), with three adults and one infant, is too small for statistical analysis.
- **Group 3** comprises individuals buried in scattered graves in the North Sector, the majority of which come from its SE Cluster. Dietary change in this group appears to involve the increased consumption over time of Kultuk Bay fishes of different species structure (i.e., characterized by a narrow range of $\delta^{13}C$ values that are much lower than in the lake's shallow water fishes) than those harvested by Group 2.[14]
- **Group 4** comprises a small group of individuals from the scattered graves of the South Sector (excluding Burial 42.02). The dietary trend of this group, which narrowly misses the level of statistical significance, shows some evidence for an increased consumption over time of inshore local fishes, and, perhaps, Baikal seal (like Groups 2 and 5).
- **Group 5** refers to all burials from Phase 2 regardless of spatial location (sectors and clusters) or grave formation (rows or scattered). This group shows evidence of a temporal dietary shift that, of all trends visible at Shamanka II, is the most clearly identifiable based on the available data. Also, it repeats very closely the trend documented for Group 2: an increased consumption over time of local shallow water Kultuk Bay fishes and, perhaps, some Baikal seal.

8. Summary and conclusions

The two-phase model of cemetery use is well supported by the radiocarbon evidence. Although this chapter examines only a limited number of mortuary variables, a few differences in how the cemetery was used during the two phases become visible. For example: (1) no new rows of graves were established during Phase 2; (2) most row burials dating to Phase 2 represent secondary use of graves already arranged into rows during Phase 1; and (3) spatial distribution of Phase 2 graves is more equitable compared to Phase 1. Chapter 8 explores the differences between the two phases in more detail.

Additional interesting aspects of the chronology of Shamanka II are (Table 2.1):

- The long duration (*Span*) of Phase 1 (*363±47 years*) relative to rather short Phase 2 (*104±78 years*); and
- The substantial gap between the phases, perhaps lasting up to 3–4 centuries, i.e., as long as the duration of Phase 1.

These findings immediately raise questions regarding the causes of the break in cemetery use, the reasons behind the reuse of the cemetery much later, and the explanation for the apparent continuity given the long gap separating the phases. The break in cemetery use documented for Shamanka II is visible neither in the Angara valley taken as a whole, nor in the dates for Lokomotiv specifically (Fig. 2.3; Fig. 2.9). The boundaries for the Lokomotiv cemetery on the Angara show very similar chronological parameters as Phase 1 at Shamanka II, while the remaining dates from the Angara valley appear to fill in much of the gap at Shamanka II (Table 2.1; Fig. 2.9).

[14] See Section 8 and Chapter 7 for more comments on this matter.

The excavations at Shamanka II produced no evidence of any structures marking the EN graves on the surface at the time they were built (Bazaliiskii et al., 2024). However, the arrangement of graves into sectors, clusters, and rows; the rarity of the disturbance of one grave by another — row and scattered graves alike; and the addition of new interments into existing graves after a considerable amount of time would all, at least intuitively, require some sort of surface markers to guide such arrangements and activities. It seems most likely that grave markers were used at Shamanka II, but that they simply did not survive the passage of time, unlike the stone cairns employed during the EBA in the Little Sea micro-region and still visible on the modern surface as, for example, at Khuzhir-Nuge XIV (Weber et al., 2008).

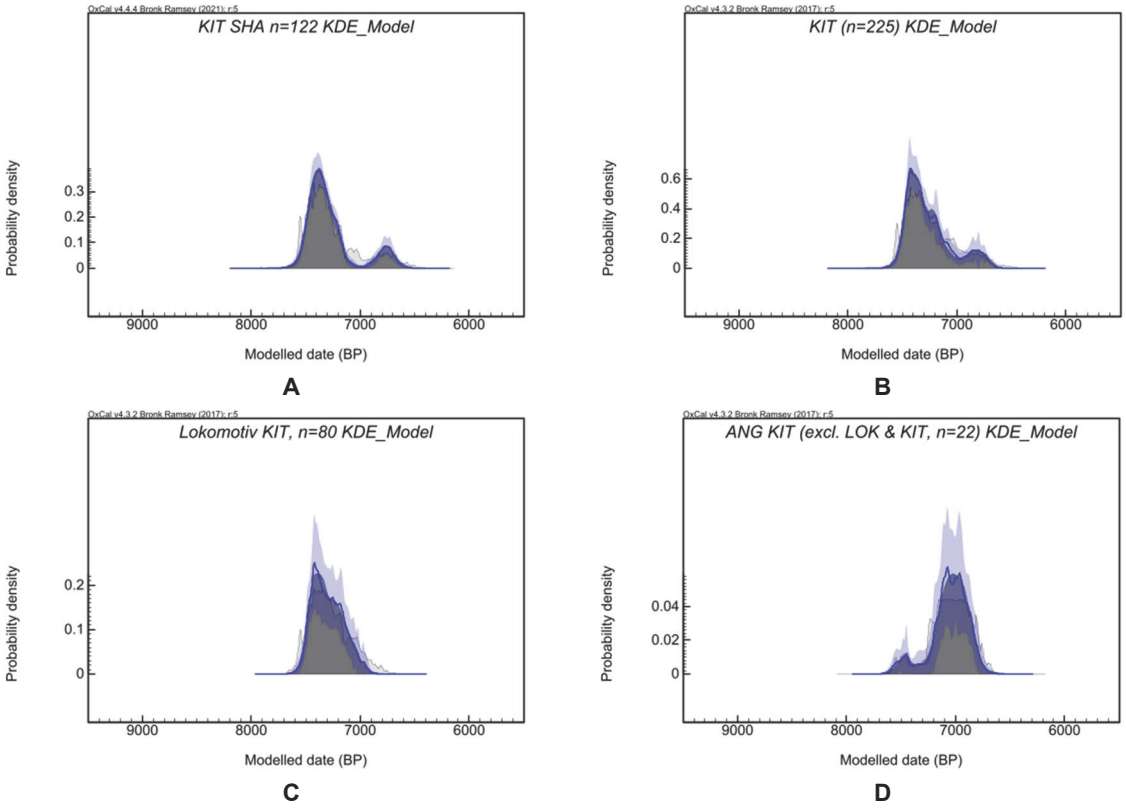


Figure 2.9. Density plots for Kitoi cemeteries on the Angara and SW Baikal (after Bronk Ramsey et al., 2021: Fig. S9). Dates for Burials 115.01 and 116 are not included in the Shamanka II dataset. Figure by chapter author:

A. Shamanka II Phase 1 & 2
B. All Kitoi (Angara & SW Baikal)
C. Lokomotiv
D. Angara excluding the Lokomotiv and Kitoi cemeteries

While the comments about the Shamanka II diet generally are in agreement with the previous assessments (Weber et al., 2011; Weber et al., 2016a), the current examination suggests revisions regarding the role of seal as well as inshore and open water fishes in the diet, and, moreover, the location of the fishery harvested by Group 3. First, perhaps seal did not contribute as much to the diet as previously suggested, an observation consistent with the analysis of the stable isotope data in the context of the corrected radiocarbon dates as discussed earlier in this chapter. Second, given the wide range of human $\delta^{13}C$ values, the relative contributions of different kinds of fishes, from the local shallows as well as from the open coast waters (i.e., littoral, gulf, and even pelagic), were apparently quite

variable between the identified dietary groups. Thus, the wide range of stable isotope signatures characterizing the aquatic foods available in Kultuk Bay is sufficient to account for the equally wide range of human isotopic values, particularly $\delta^{13}C$ measurements, documented for the Shamanka II cemetery population. In other words, the isotopic variation in human values is fully explicable in terms of a variable contribution of the different kinds of Baikal fishes from its various habitats, all potentially available for procurement in the waters of the Kultuk Bay, as well as the Baikal seal. This second revision brings up the puzzling matter of the location of the fishery used by the members of Group 3.

Two places have been suggested (Weber et al., 2016a): the lower Selenga River (about 220 km to the east) and the middle Irkut River (about 30–150 km to the west). Both, however, seem rather unlikely as they run into the same problem: If the members of Group 3 relied so much on this distant fishery, why not to bury their dead closer to it as Group 2 and, indeed, all other Kitoi groups on the Angara seem to have been doing? This is an especially valid point if the notion — generally accepted now in the relevant literature — that hunter-gatherer cemeteries function also as territorial markers legitimizing access to critical resources — is taken into consideration (Goldstein, 1981; Saxe, 1970). Obviously, a cemetery used by Group 3 located so far from its fishery could not serve this purpose as effectively as it did for Group 2 with its fishery nearby, or — more likely — could not serve this purpose at all. If the home range of Group 3 people were located on the lower Selenga, Fofanovo — a cemetery used already from the Late Mesolithic — would have been a more logical place as the burial ground for Group 3 dead (Lbova et al., 2008). Additionally, the potential of a Selenga location has been recently refuted by examination of human carbon and nitrogen stable isotope data from the multi-period Fofanovo cemetery situated there (White et al., 2021), which differ from those characterizing Group 3 individuals. Clearly, a different explanation is in order.

Almost certainly, none of the five very small streams discharging into Kultuk Bay (Sliudianka, Pokhabikha, Talaia, Kultuchnaia, and Medlianka) should be considered a viable fishery for even small-scale intensification given the fishing techniques available to these people. In this context, it seems more likely that the Group 3 fishery was located in Kultuk Bay, like that of Group 2, and that the reason for the different isotopic vectors of their dietary trends may rather be related to the preferential use of different fishing techniques (i.e., single fishhook lines, leisters, harpoons, trot lines, nets, weirs, traps, etc.) which would target fishes with different behaviour and ecology, and thus different isotopic characteristics (see also Chapter 7). Maintained seasonal differences in access to, and use of, the Kultuk Bay fishery may also have had an effect on long term isotopic signatures. Indeed, the higher quantity of Fishing Gear as well as the higher prevalence and quantity of Bow & Arrow grave goods in Male graves of Group 3, relative to Group 2, suggest a greater emphasis on individual male efforts both in fishing and game hunting (c.f., Chapter 8). Therefore, perhaps, the dietary trend visible among the members of Group 3 was a product of mostly male fishing with less-intensive techniques. The shores and shallows of Kultuk Bay are expansive enough to accommodate such a differential distribution of fishing conducted by all the social groups that used the cemetery.

With regard to dietary change over time, Groups 2 and 5 show the strongest evidence for dietary trend. Indeed, Group 5 (Phase 2) appears to be repeating the trend first displayed by Group 2 (Phase 1 SE Cluster individuals from graves in rows): both are based on an increasing consumption of the same fish species from the surrounding shallows of Kultuk Bay. But there are also some differences between these two trends: (1) relative to Group 2, the trend of Group 5 unfolded and ended at a much faster pace; (2) its duration

was much shorter; and (3) it shows much lower individual variation (i.e., all measured individuals are much closer to the best fit line; Fig. 2.8.A and C).

Groups 3 and 4, both from Phase 1, also show a dietary trend involving an increased consumption of local shallow water Kultuk Bay fishes over time. However, for Group 3 this trend involved the procurement of different species relative to those harvested by the contemporary Group 2 and the much later Group 5. For Group 4, the relationships between the relevant isotopic results do not achieve statistical significance but this observation should not be dismissed for it is consistent with the general pattern of substantial dietary diversity and temporal trends documented across the Shamanka II cemetery population.

Lastly, it is unclear why the members of Group 1 (Phase 1 burials from row graves in the NW Cluster and in the South Sector) did not change diet over time while the rest of the groups apparently did. The small sample sizes of the NW Cluster and the South Sector row burials when analyzed separately may not necessarily be the cause because Group 4, an even smaller sample, does show a dietary trend. One possible reason might be that Group 1 is more heterogenous in its socio-economic structure than the other groups as indicated, perhaps, by the fact that these rows belong to two different sectors and, moreover, by the different orientation of one its rows (Row K). That not all spatial units at Shamanka II display some sort of dietary trend is also similar to the recent findings from the large Kitoi Lokomotiv cemetery on the Angara where, likewise, some clusters show a trend while other clusters do not (Fig. 2.8.D; Table 2.3; Weber et al., 2021).

Chapter 3. Approach to the analysis of mortuary variation

Andrzej W. Weber, Vladimir I. Bazaliiskii, Erin Jessup

1. Introduction

This chapter presents the approach to the examination of mortuary variation at Shamanka II employed in Chapters 4–6 and partly also in Chapter 7. With 97 graves and 156 burials, Shamanka II is the largest Early Neolithic (EN) cemetery excavated to date and the only one in the entire Cis-Baikal excavated in full.[15] Despite the large number of archaeologically documented Middle Holocene cemeteries, graves, and burials, thus the unprecedented on a global scale wealth of information on Holocene hunter-gatherer mortuary practices (e.g., Bronk Ramsey et al., 2021; Weber and Bettinger, 2010; Weber et al., 2010), quantitative examinations of this material with regards to EN, but also Late Neolithic (LN) and Early Bronze Age (EBA), hunter–gatherer groups in the region have been rare. This applies to the vast majority of work completed so far in Russia, including the most comprehensive — although rather dated now — analysis by A.P. Okladnikov (Okladnikov, 1950; Okladnikov, 1955).

Recently, McKenzie and colleagues examined Khuzhir-Nuge XIV, the largest EBA cemetery in Cis-Baikal, employing Correspondence Analysis (McKenzie et al., 2008) while Goriunova and colleagues summarized in quantitative terms the EN and LN mortuary variation in the Little Sea micro-region (Goriunova et al., 2020; Goriunova et al., 2021). Moreover, based on the extensive dataset of biochemical data (radiocarbon dates, and carbon and nitrogen stable isotope measurements), Scharlotta and colleagues (Scharlotta et al., 2016) employed Principal Components Analysis to examine temporal changes in the distribution of grave goods at Shamanka II. In a follow up study, the authors analyzed the same dataset to look for evidence for differential parental investment in children (Scharlotta et al., 2021). Both studies explicitly focused on grave goods (i.e., variation in other mortuary aspects was not part of the analysis) grouped into 16 categories, thus differently than here. Also, to keep sample sizes large enough, both studies emphasized comparison between the three spatial groups of graves (i.e., NW Cluster, SE Cluster, and S Sector) and Phase 1 vs. Phase 2, thus also different than here.

[15] Lokomotiv, located at the confluence of the Angara and the Irkut River, is believed to be the largest Kitoi cemetery (Bazaliiskii, 2010), however, its excavated component is much smaller than Shamanka II and, moreover, materials from the older excavations have been lost while the graves excavated in the late 20th century have not been published yet.

Despite these recent advances in the area of quantitative approaches, including formal statistical analysis, Cis-Baikal Middle Holocene mortuary practices remain substantially understudied. Hence the importance of the Shamanka II dataset and its systematic presentation and examination.

As a brief reminder, it is practical to present a summary of the main characteristics defining the Kitoi mortuary tradition (Bazaliiskii, 2010; Weber, 2020; Weber et al., 2021). Geographically it is confined to the valley of the upper section of the Angara River, where most of the cemeteries are located, and to the southwest coast of Lake Baikal (Kultuk Bay), so far with only one cemetery, although very large — Shamanka II. The recent discovery of a Kitoi cemetery in Moty–Novaia Shamanka on the lower section of the Irkut River (~50 km upstream from its confluence with the Angara), suggests that the extent of Kitoi groups included also at least some of the Angara's left tributaries (Bazaliiskii et al., 2016). In size, Kitoi cemeteries are frequently medium (e.g., Ust'-Belaia, Galashikha; Georgievskaia, 1989) to large (e.g., Kitoi; Okladnikov, 1974) and very large (e.g., Lokomotiv, Shamanka II; Bazaliiskii and Savel'ev, 2008) but localities with single or very few graves exist too (e.g., Serovo, Shumilikha, Ust'-Ida I, etc.; Okladnikov, 1976; Okladnikov and Konopatskii, 1984; Tiutrin and Bazaliiskii, 1996). Stone structures (on the surface or inside the grave pits) are essentially absent, body position is predominantly extended supine (rarely flexed and only occasionally bundled or prone), and heads generally point north (sometimes to the south in graves with multiple individuals arranged head-to-toe). Single interments are most common but graves with more than one individual side by side (occasionally placed head-to-toe), stacked or in layers are not uncommon and occur at several cemeteries. The use of copious amounts of red ochre is almost omnipresent and considered one of the most reliable diagnostic characteristics of the Kitoi mortuary protocol.

Grave goods are variable in kind (60–65 categories) and number, from no grave goods to hundreds and more (Bazaliiskii, 2010). Most common, in terms of frequencies and quantities, are lithic composite fishhook shanks, arrowheads, and bifaces for composite tools and weapons. Other well-represented categories include a variety of stone tools (knives, scrapers, drills etc.), a gamut of bone and antler tools (harpoons, points, and shafts or handles for a range of composite tools and weapons), as well as objects made of green nephrite (adzes, knives). Bow stiffeners made of bone or antler are known from several graves. Ceramic vessels (all mitre-shaped with net impressions) are very rare, recorded in only one or two graves per cemetery, even at the largest ones such as Lokomotiv and Shamanka II. Common ornaments include rings, disks, and boar tusk pendants, all appearing in low numbers, as well as beads, red deer canine pendants, and marmot incisors — frequently present in large numbers. Mother-of-pearl pendants and zoomorphic art (moose heads, fish models, and seal heads) are rare. Of all these grave goods, the most culturally diagnostic are the composite fishhook shanks (Kitoi type), arrowheads (with asymmetrical concave base), and objects made of green nephrite.

A few idiosyncratic characteristics with distributions limited to individual cemeteries include the mortuary use of fire and bear rituals, both reported for Shamanka II (Bazaliiskii, 2010), post-burial disturbances documented for Ust'-Belaia and also for Shamanka II (Bazaliiskii, 2010; Georgievskaia, 1989), and burials with missing skulls as at Lokomotiv (Bazaliiskii, 2010; Bazaliiskii and Savel'ev, 2008; Okladnikov, 1974). Overall, this mortuary package appears with substantial consistency and, when present, identifies the Kitoi mortuary tradition almost unmistakably.

Given the current state of research on Kitoi mortuary practices, the approach employed in this analysis is semi-quantitative in that while the variation documented at Shamanka II is quantified as much as possible, its analysis is limited to subjective assessment of a range of contingency tables without the use of formal statistical methods (see Section 2.5 "Quantitative methods" for more information on this matter). Particular attention is paid to the following three main levels (objects) of analysis: Grave, Burial, and Grave Goods — all further described by a number of more specific characteristics.

After these introductory notes, the approach is explained in more detail and the analysis of mortuary variation is presented separately in Chapters 4–7, each dedicated to a different aspect of mortuary practices, followed by Chapter 8 where the results are summarized within a broader context of the history of the Kitoi cultural pattern.

2. Levels of analysis

As already mentioned, mortuary variation at Shamanka II is examined at three levels (objects) of analysis defined in the following manner:

- Grave is the physical facility (normally a pit of certain dimensions and shape and backfilled with fine sediment, rocks or combinations of both) built for the disposal of the dead and usually containing their remains;
- Burial (synonyms: interment, individual, or skeleton) denotes the physical remains of the interment(s), usually represented by skeletal elements;
- Grave goods (synonyms: grave inclusions or accoutrements) — further defined in Chapter 5 — are all archaeological objects (artifacts, faunal remains, etc.) found in a grave.

2.1. Scales of measurement

Variation documented for the three objects of analysis is assessed using a range of additional mortuary variables and employing all four standard scales of statistical measurement: nominal, ordinal, interval, and ratio (e.g., Shennan, 1988). The groups of grave goods are measured on two scales: nominal as Present or Absent (i.e., prevalence or frequency counts and rates) as well as ratio, that is as quantities of objects (i.e., abundance). Operational definitions explain, as necessary, the meaning of each mortuary variable and how the variation is categorized and measured. In some instances (e.g., Head Direction or Skeletal Completeness) it was necessary to reduce the documented variation to a manageable and more meaningful number of categories. All this is presented as a preamble to the analysis of variation and identification of distribution patterns of each mortuary variable (Chapters 4–7). The complete Grave Level and Burial Level datasets, along with variables and operational definitions are presented in the GAI Monograph in Supplements 7–10 (Jessup et al., 2024a; Jessup et al., 2024b; Jessup et al., 2024c; Jessup et al., 2024d).[16] The Grave Level supplement includes also Grave Goods data.

[16] These supplements include also data on a few dozens of other variables which, while not analyzed, still supply additional information about the graves and burials.

2.2. Independent variables

Independent variables (factors) are those that are believed to control the state and distribution of dependent variables. In mortuary archaeology, dependent variables typically include a spectrum of attributes describing grave architecture, treatment of the dead, and grave goods. Independent factors may include chronological units (e.g., phases), archaeological cultures or sites, geographical criteria (e.g., regions) and, in case of cemeteries, spatial units (sectors, clusters, formation patterns) or biological criteria such as burial age and sex. Some variables can serve as both independent and dependent. For example, when examined by cemetery sector, burial sex is considered a dependent variable but when body position is compared between females and males, it serves as an independent variable.

At Shamanka II, possibilities for the identification of units of analysis based on various combinations of independent variables are quite numerous. There are two phases of cemetery use, two sectors, two clusters within one of these sectors, two grave formations (i.e., in rows and scattered; Fig. 2.1) and, of course, individuals of both sexes and of ages varying from infant to old adult. This large number of options makes it difficult to identify units of analysis that are culturally meaningful and limited in number, which is essential lest the analysis become cluttered and inferences impossible. To circumvent this difficulty, this study utilizes Main Units of Analysis (MUA): groups of burials first identified by Weber and colleagues (Weber et al., 2016a; Weber et al., 2021) and further modified for this analysis in Chapter 2 based on a combination of spatial, chronological, and dietary criteria as explained below.

2.3. Main Units of Analysis

Shamanka II presents a rather unambiguous spatial organization (Fig. 2.1; Fig. 3.1; Table 3.1). There is a gap of ~12 m between the North and South Sectors and another one ~5 m wide separating the NW and SE Clusters. This results in three spatial groups of graves further referred to as the NW, SE, and S Clusters.[17] Individual graves are either scattered or arranged into rows consisting of a minimum of three parallel graves. Thirteen such rows have been identified: 4 in the NW Cluster, 6 in the SE Cluster, and 3 in the S Cluster. The highest number of graves in a row is nine. Most rows run NW–SE with the exception of Rows K and L which are oriented NE–SW and are located at opposite ends of the cemetery. Cluster and Formation (Row vs. Scattered) are only rarely used in the analysis as independent variables because they are already accounted for as defining aspects of the MUAs as described below.

Equally unambiguous is the chronological structure of Shamanka II — separated into Phase 1 and Phase 2 — defined by direct radiocarbon dating of all individuals with sufficient skeletal remains (Fig. 3.2; Weber et al., 2016a; Weber et al., 2021). Phase 1 lasted a few hundred years while Phase 2 was much shorter: perhaps as brief as only a few generations. In this original chronological classification, most of the dated adults (n = 105) belonged to Phase 1 and a much smaller number to Phase 2 (n = 17) with 22 individuals not initially assigned to a phase: 20 young children because their dates could not be corrected and 2 adults without dates due to a lack of suitable skeletal material for analysis (Burials 35.02 and 98).

[17] The designations of South Sector and South Cluster are used alternatively.

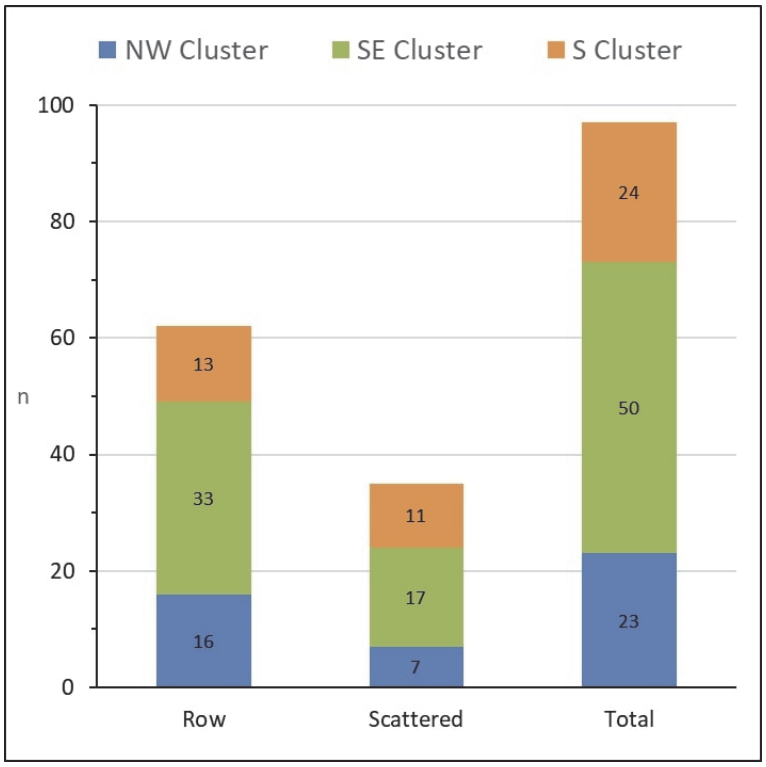


Figure 3.1. Shamanka II, Spatial distribution and formation of graves (after Table 3.1). Figure by chapter authors

Table 3.1. Shamanka II: Spatial distribution and formation of graves

Grave formation	NW Cluster	SE Cluster	S Cluster	Row Total
Row	16	33	13	62
Scattered	7	17	11	35
Total	23	50	24	97

The dietary structure of the weaned Shamanka II cemetery population (i.e., above the age of 5 years) has been established through the Pearson Product-moment Correlation coefficients analysis of stable isotope carbon and nitrogen measurements and radiocarbon date for each burial as described in Chapter 2. This exercise sorted all examined Shamanka II individuals into dietary groups that differed from one another not only in terms of diet structure (i.e., the balance between various aquatic and terrestrial foods) but mainly in terms of directional change over time and one group that could not be examined in detail because the sample size was too small. Also, it is necessary to keep in mind that the spatial structure of Group 1, spanning two sectors and including rows with different orientation, is — in terms of archaeological expression — more heterogenous than the other units.[18]

[18] Group 1 could be divided further into two separate units: Group 1A for the NW Cluster (row graves) and Group 1B for the S Cluster (row graves). However, designation of these two units is not employed in this analysis though it might be practical for future studies.

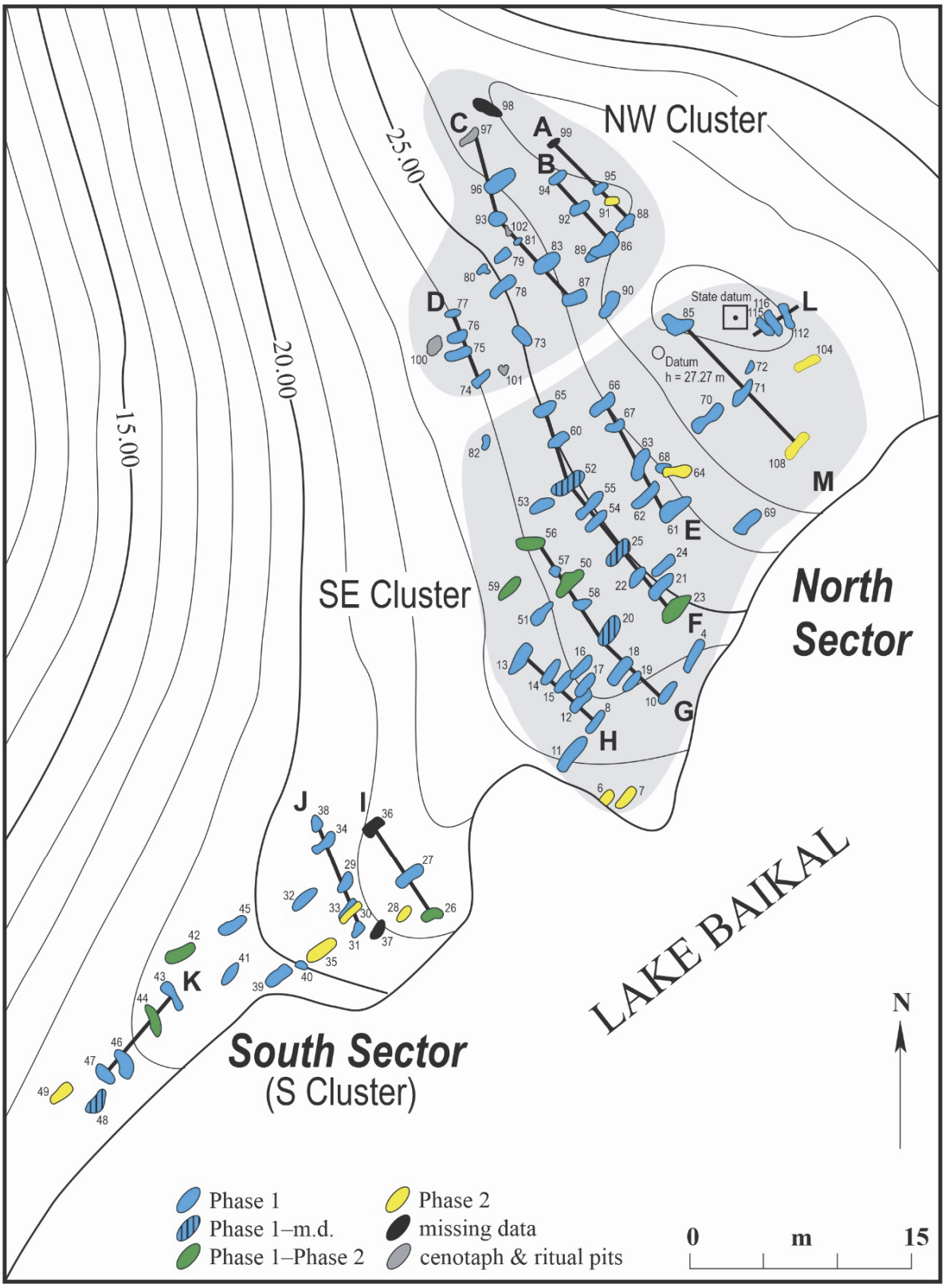


Figure 3.2. Shamanka II site map showing chronological assignment of graves to phases with sectors, clusters, and rows. Figure by chapter authors

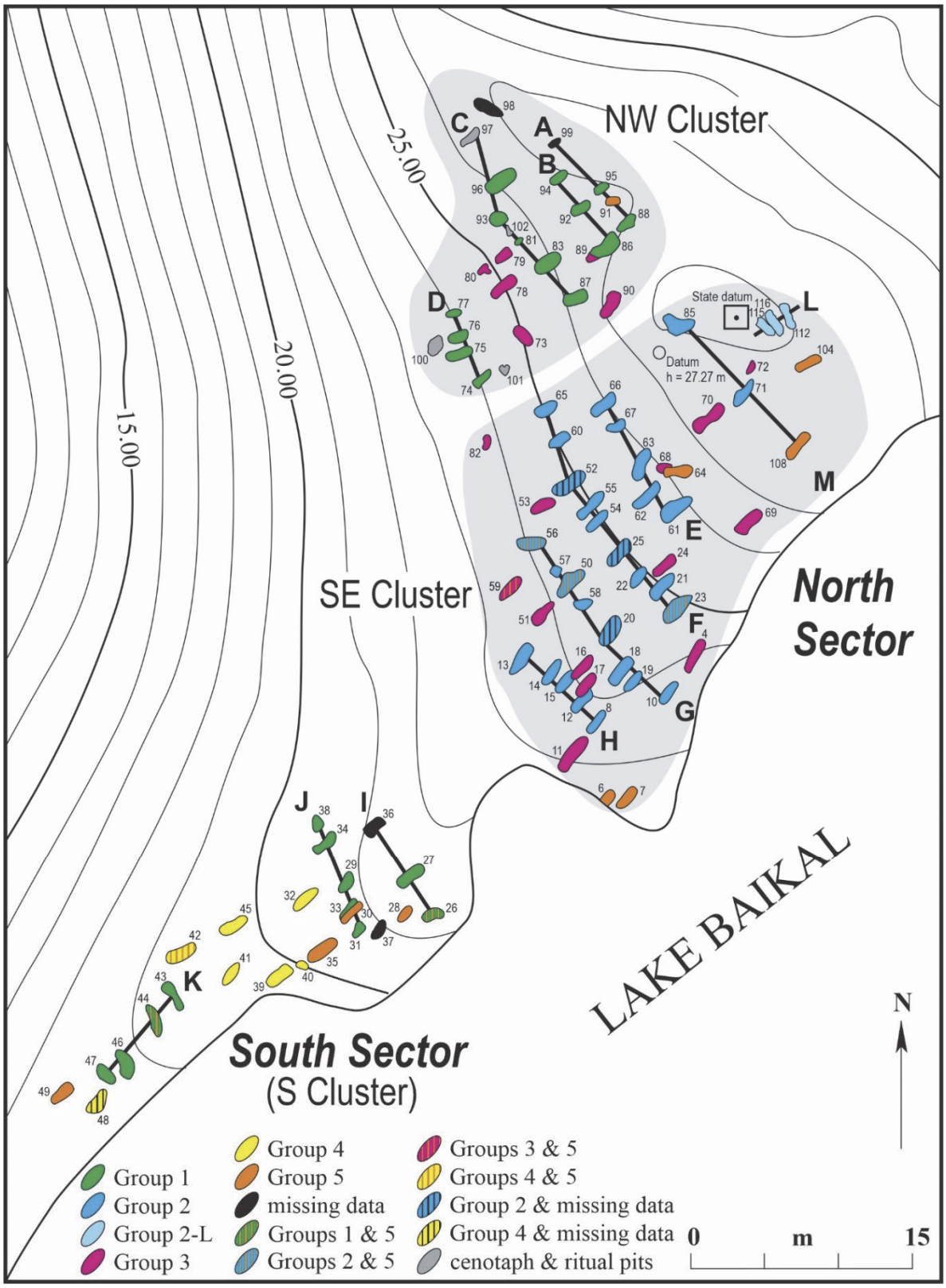


Figure 3.3. Shamanka II site map showing assignment of graves and burials to Main Units of Analysis with sectors, clusters, and rows. Figure by chapter authors

In sum, it is these six groups of individuals that constitute the basis for the MUAs employed in Chapters 4–7 (Fig. 3.3):

Phase	MUA	Description	Dietary trend
Phase 1	Group 1	NW and S Cluster burials from graves in Rows A, B, C, D, I, J, and K	No dietary trend when analyzed together or separately
Phase 1	Group 2	SE Cluster burials from graves in Rows E, F, G, H, and M	Increasing consumption of local Kultuk Bay fishes and, perhaps, some Baikal seal
Phase 1	Group 2–L	SE Cluster burials from graves in Row L (3 adults and 1 infant)	Sample too small to demonstrate a dietary trend
Phase 1	Group 3	NW and SE Cluster burials from scattered graves	Increasing consumption of local Kultuk Bay fishes of different species structure than Groups 2, 4 and 5
Phase 1	Group 4	S Cluster burials from scattered graves	Dietary trend similar to Groups 2 and 5 but narrowly missing statistical significance
Phase 2	Group 5	All Phase 2 burials: NW, SE and S Cluster burials from row and scattered graves	Increasing consumption of local Kultuk Bay fishes and, perhaps, some Baikal seal

While leaving the young children (<5 years old) out of the analysis of dietary trends makes sense, it equally makes sense to include them in the analysis of mortuary variation which requires that they are assigned to Phase 1 or Phase 2. Since their radiocarbon dates cannot be corrected using the associated stable isotope results, the dates were adjusted using the average (464 years) and maximum (719 years) differences between the conventional and corrected dates obtained for the rest of the Shamanka II population. In 16 instances both adjustments assigned individuals to Phase 1, in 5 instances to Phase 2, and in 1 instance (Burial 80) the average difference placed the burial in Phase 1 while the maximum difference placed it in Phase 2. In Grave 56, the upper burial of a young child (Burial 56.01, 3–5 years old) was assigned using this method to Phase 2, while the burial of an old child (Burial 56.02, 8–10 years old) found about 50 cm lower (Fig. 3.4) was attributed to Phase 1 based on its corrected radiocarbon date. This is consistent with a few other graves which were built during Phase 1 and subsequently reopened during Phase 2 to inter new burials (Gr. 23, 26, 42, 44, 50, and 59; Chapter 2).

In cases where young children come from undisturbed graves that also include adult burials clearly interred at the same time (Gr. 61, 63, 66, 69, and 115; e.g., Fig. 3.5), their phase assignments could be verified based on the principle of association. This principle was particularly useful in confirming the assignment of the infant from Grave 115 (Burial 115.02, 0–2 years old) to Phase 1. In this case, adjustment by the average difference placed this burial in Phase 1, while adjustment by the maximum difference placed it just slightly outside the youngest Phase 1 date. The date for the adult female from this grave (Burial 115.01, 20–25 years old) belongs to the second half of Phase 1, supporting the placement of Burial 115.02 in this phase as well.

Moreover, for five young children (Burials 40, 80, 81, 87, and 95) it was possible to obtain radiocarbon dates on associated remains of terrestrial fauna, placing all five firmly within Phase 1, including the 3–9-month-old infant from the single-burial Grave 80 with the ambivalent chronological assignment as mentioned above (Table S.2; Table S.3). These results give some measure of confidence in the method used especially because the ensuing analysis of mortuary variation, unlike the assessment of diet, does not search for temporal trends, which should employ radiocarbon dates for each burial (e.g., Scharlotta et al., 2016). Instead, for the purpose of this comparison it is sufficient to look at the MUAs as chronologically flat blocks of data.

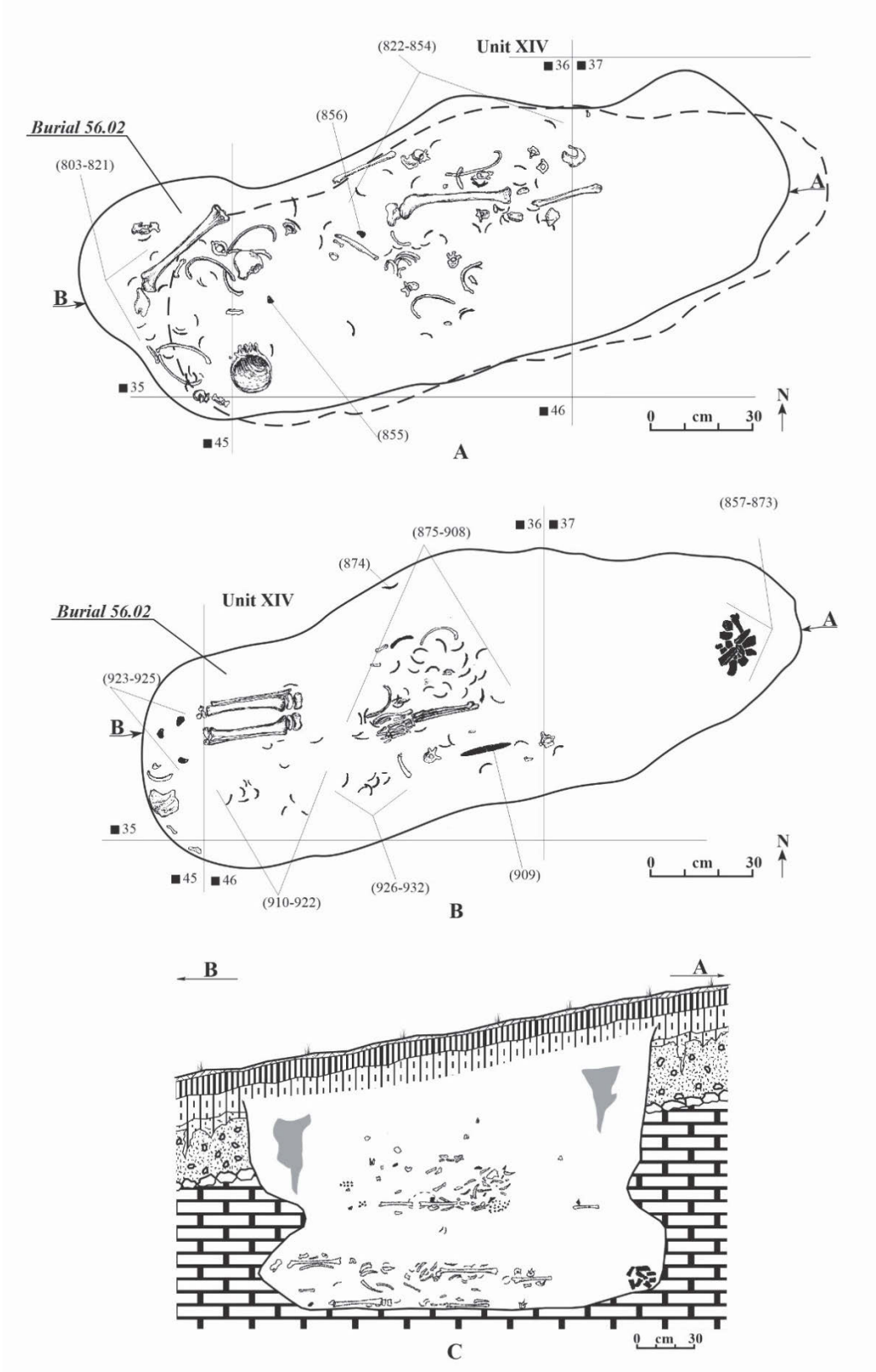


Figure 3.4. Shamanka II, Grave 56. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii:

A. Floor plan of the upper level
B. Floor plan of the lower level
C. Longitudinal-section

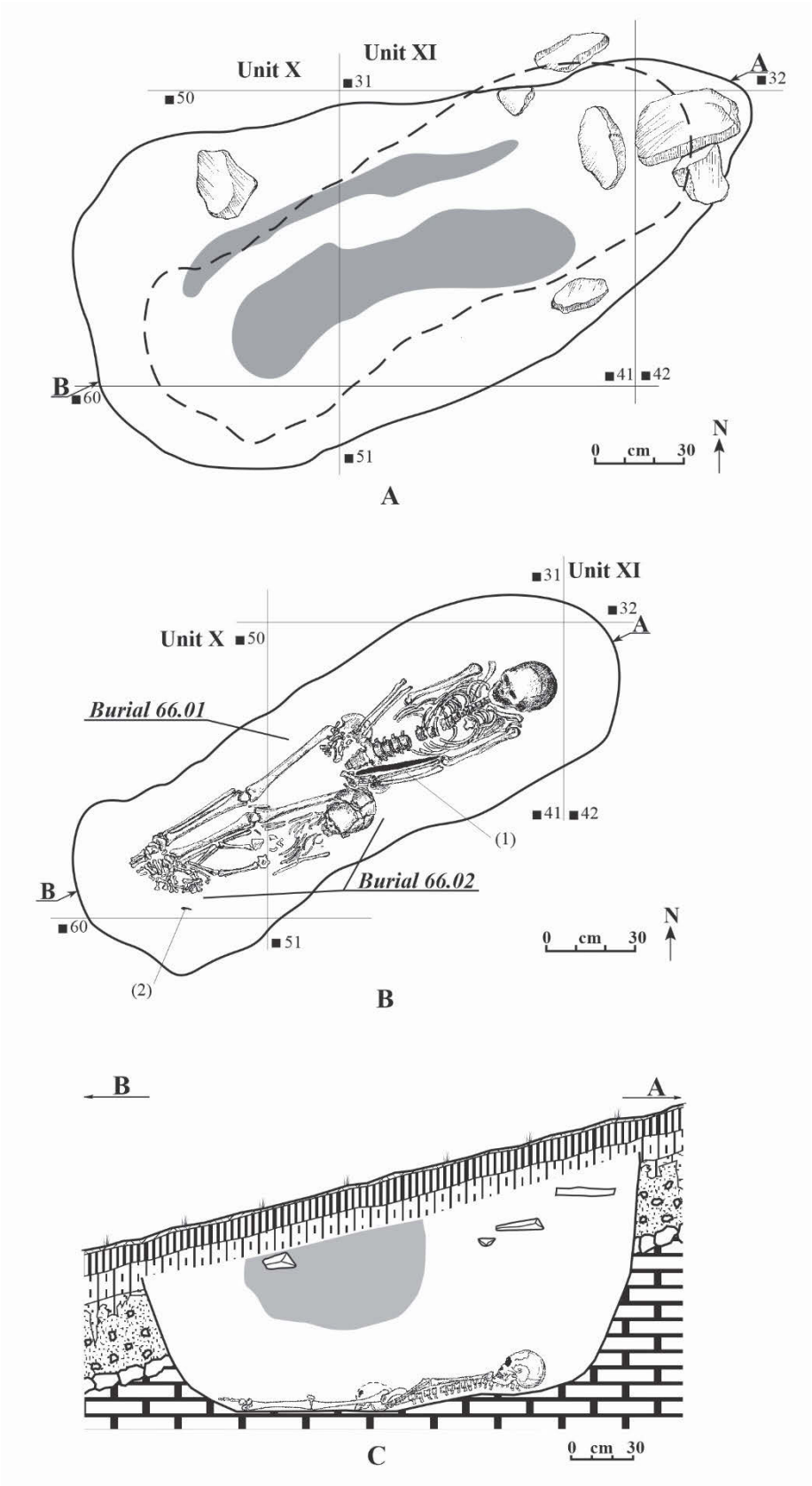


Figure 3.5. Shamanka II, Grave 66. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii:

A. Floor plan of the upper level
B. Floor plan of the lower level
C. Longitudinal-section

Next, individual graves are assigned to MUAs based on the assignment of the burials within. For graves with single burials the matter is simple: a grave belongs to the same MUA as the interment within. For graves with multiple burials, the matter is not as simple. While most graves with more than one burial show a relatively compact chronological structure in that all interments date either to Phase 1 or Phase 2 (Fig. 3.6; Table 3.2), several graves contain burials belonging to both phases or burials that could not be assigned to a phase at all. In these cases, graves were chronologically classified as Phase 1–Phase 2 or Phase 1–m.d. and thus not assigned to any of the relevant MUAs (Jessup et al., 2024a).[19]

In the last step, burials and graves of young children from Phase 1 were assigned to a specific MUA based on the spatial criteria as described above resulting in units of analysis as presented in Tables 3.2 and 3.3.

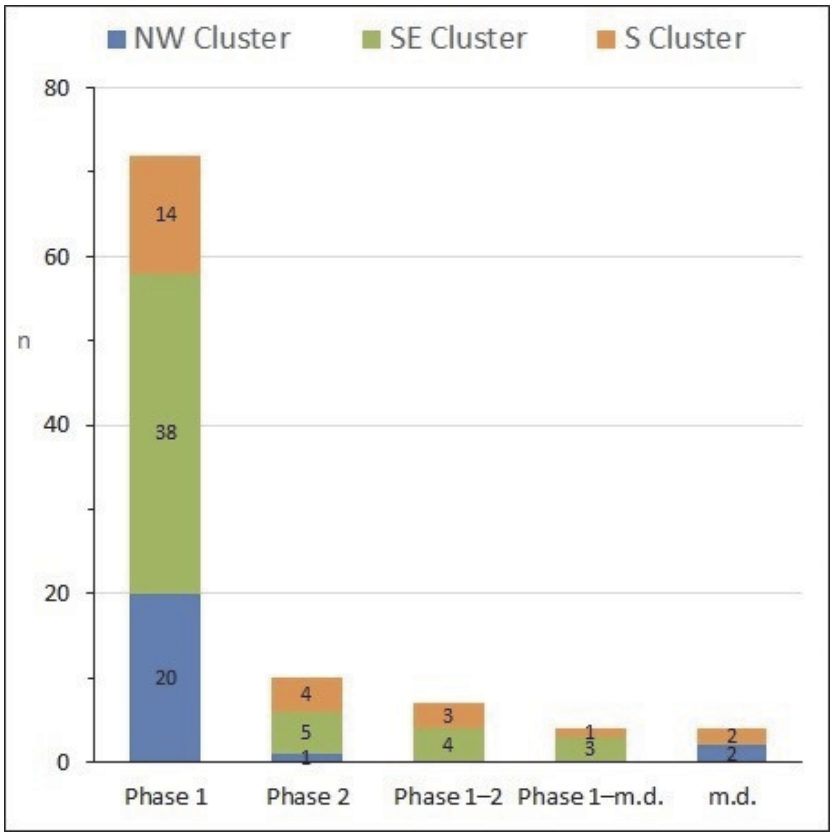
Table 3.2. Shamanka II: Number of graves by Main Unit of Analysis. Note: "0" values have been removed

Main Unit of Analysis	NW Cluster	SE Cluster	S Cluster	Row Total
Phase 1	20	38	14	72
Group 1	14		9	23
Group 2		23		23
Group 2–L		3		3
Group 3	6	12		18
Group 4			5	5
Phase 2	1	5	4	10
Group 5	1	5	4	10
Phase 1–Phase 2		4	3	7
Phase 1–m.d.		3	1	4
m.d.	2		2	4
Total	23	50	24	97

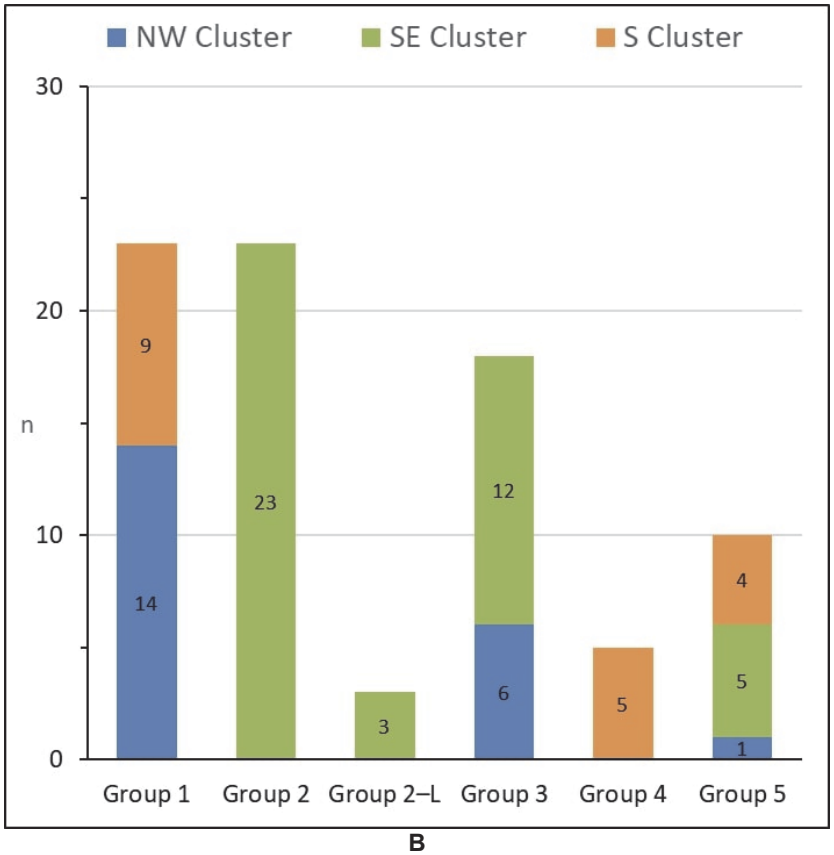
Table 3.3. Shamanka II: Number of burials by Main Unit of Analysis. Note: "0" values have been removed

Main Unit of Analysis	NW Cluster	SE Cluster	S Cluster	Row Total
Phase 1	24	75	21	121
Group 1	16		14	30
Group 2		52		52
Group 2–L		4		4
Group 3	9	19		28
Group 4			7	7
Phase 2	1	11	9	21
Group 5	1	11	9	21
m.d.	2	6	6	14
Total	28	92	36	156

[19] MUAs, therefore, can be determined at both the grave and burial level and these are not necessarily identical when the grave contains multiple burials. Grave 42, for example, cannot be attributed to an MUA (at the grave level) because it contains Burial 42.01 which belongs to Group 5 (Phase 2) and Burial 42.02 which belongs to Group 4 (Phase 1).



A



B

Figure 3.6. Shamanka II, Number of graves (after Table 3.2). Zeros have been removed for readability. Figure by chapter authors:

A. By Phase
B. By Main Unit of Analysis

Figure 3.7. Shamanka II, Number of burials (after Table 3.3). Zeros have been removed for readability. Figure by chapter authors:

A. By Phase
B. By Main Unit of Analysis

Some of the larger MUAs can be divided further based on sex and age criteria to facilitate more detailed analysis. To create demographic categories amenable to quantitative analysis, the original sex and age determinations have been grouped in the following manner:

- General Sex
  - Unsexed Children;
  - Females (including Female and Probable Female);
  - Males (including Male and Probable Male);
  - Unsexed Adolescents or Adults; and
- General Age
  - Young Children (<5 years old);[20]
  - Old Children (5 to <13 years old);
  - Adolescents (13 to <18 years old);
  - Adults (≥18 years old);
  - One additional age category of Adolescent–Adult has been created for an individual aged only using the length of the sediment discoloration clearly showing the outline of the interment (Burial 98; Fig. 4.6; Bazaliiskii et al., 2024).

Using these grouping rules produces the following General Sex and Age Structure of the Shamanka II cemetery population with the detailed age and sex determinations provided in Jessup et al., 2024c:

Table 3.4. Shamanka II: Sex and age structure. Note: "0" values have been removed

Sex	Young Child	Old Child	Adolescent	Adol.–Adult	Adult	Row Total
Children	24 (15.4%)	7 (4.5%)				31 (19.9%)
Females			3 (1.9%)		35 (22.4%)	38 (24.4%)
Males			2 (1.3%)		72 (46.2%)	74 (47.4%)
Undetermined Adults			2 (1.3%)	1 (0.6%)	10 (6.4%)	13 (8.3%)
Total	24 (15.4%)	7 (4.5%)	7 (4.5%)	1 (0.6%)	117 (75%)	156 (100%)

Although useful from the perspective of searching for additional insights, dividing MUAs by General Sex and General Age categories frequently generates samples that are too small or too variable in size for meaningful comparison (Fig. 3.8; Table 3.4). This is because the sizes of the MUAs vary substantially to begin with (Fig. 3.6; Fig. 3.7; Table 3.2; Table 3.3). Consequently, dividing the MUAs into smaller groups is not always useful and when employed, the results should be viewed with caution.

In sum, the MUAs as defined above are a practical option to proceed with descriptive analysis and to present the mortuary variation at Shamanka II with sufficient detail. If chronological and dietary dimensions had been unavailable, clusters and grave formations would have had to be used as the main independent variables to define units of analysis. For Shamanka II, this would mean grouping together individuals belonging to different phases of cemetery use and also pursuing somewhat different dietary strategies and thus likely belonging to different social units. Doing so would inevitably corrupt analysis and confuse results and inferences.

[20] Since the age of all individuals can only be established as a range (e.g., 4–6 years old) rather than a specific number, mid-points of each such age range (i.e., 5 years in this case) have been used for grouping burials into broader age categories.

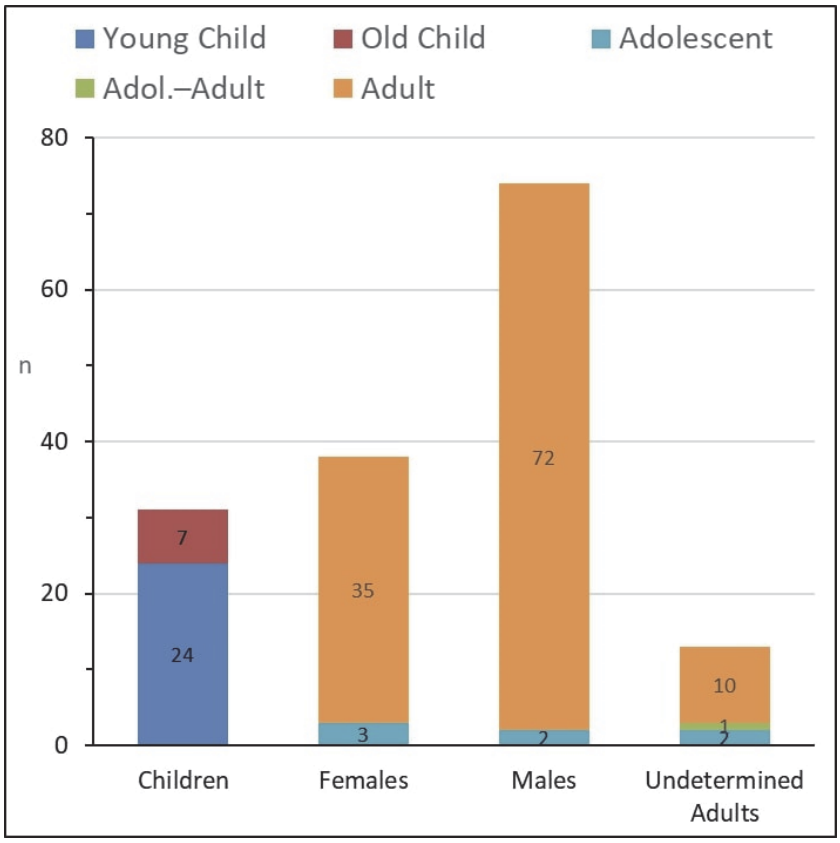


Figure 3.8. Shamanka II, Sex and age structure (after Table 3.4). Zeros have been removed for readability. Figure by chapter authors

2.4. Dependent variables

Of the large number of characteristics available to describe the Kitoi mortuary practices at Shamanka II (Bazaliiskii et al., 2024), particular attention is paid to those that have been traditionally used in the Cis-Baikal Middle Holocene archaeology to define its mortuary traditions. For the Burial Level of analysis, variables selected for examination include Age and Sex of interments, Burial Type, Body Position, Skeletal Completeness, and Articulation while for the Grave Level the focus is on Condition, EN Disturbances, Number of Burials, Grave Sex Structure, Grave Age Structure, as well as the Vertical and Horizontal Arrangement of burials in graves with more than one interment.

Several characteristics at both levels of analysis are examined only briefly either because they do not display enough variation to study in detail or because they are rather idiosyncratic and not particularly amenable to quantitative assessment. The first group includes Grave Axis (i.e., grave pit orientation) at the Grave Level and Red Ochre, Head/Skull Treatment, and Head Direction, at the Burial Level. The Mortuary Use of Fire, Bear Rituals (i.e., bear skeletal remains), and Foreign Human Bones belong to the second group and are examined in a separate chapter of this monograph (Chapter 6).

A number of additional characteristics, although included in the GAI Supplements, are not analyzed at all due in part to insufficient variation but also because they are not particularly diagnostic of any of the Cis-Baikal Middle Holocene mortuary traditions. These include grave pit physical dimensions and shape, the composition of grave pit backfill and a few other similar descriptors.

Grave goods, analyzed separately in Chapter 5, are quite numerous (over 13,000 items in total) and variable in terms of quantity, function, and morphology. For this examination, grave goods have been grouped into the following five main functional categories: Bow & Arrow technology, Composite Tools & Weapons, Fishing Gear, Knives, and Ornaments. Needle Cases and Zoomorphic Art are analyzed in Chapter 6. Additional methodological comments regarding examination of grave goods are provided in the introduction to Chapter 5.

In sum, the number of mortuary characteristics selected for examination is large enough to enable a quantitative assessment of mortuary variation at Shamanka II, the kind of overview greatly needed for all Middle Holocene mortuary traditions in Cis-Baikal including Kitoi.

2.5. Quantitative methods

For a few reasons, this analysis does not employ formal statistical methods such as Correspondence Analysis, Principal Component or Factor Analysis, all of which would be appropriate for this material as they involve variation reduction and examination of covariation — a necessity for datasets as rich and diverse as Shamanka II. First, in a formal statistical analysis of this kind a coherent approach to defining meaningful and informative independent and dependent variables is crucial and the previous analysis by Scharlotta and colleagues (Scharlotta et al., 2016) can only be considered a preliminary and incomplete attempt at this. Second, the numbers presented in Tables 3.2 and 3.3 demonstrate substantial differences in the size of the MUAs both at the Grave and Burial levels of analysis and dividing the MUAs further based on other criteria (e.g., Sex and Age) makes sample sizes even less balanced. Consequently, any statistical analysis will inevitably run into problems related to statistical significance. Third, such analysis should also be guided by a well-defined theoretical approach. Addressing all these matters would be beyond the scope of this monograph in general as well as of Chapters 4–7 specifically, which is to present, as comprehensively as possible, the range of mortuary variation documented at Shamanka II. However, the approach to defining the independent and dependant variables for examination developed for this study shall be considered a useful next step in search for the best approach to this rather complicated matter.

The chosen approach is based on a range of tables showing mortuary variation at Shamanka II in quantitative terms, also a necessary step to guide more advanced approaches to examine this matter more thoroughly in the future. To achieve this end, the analysis uses descriptive statistics and contingency tables generated using the Pivot Table function in Microsoft Excel applied to the two main tables in which variation at the Grave and Burial Levels has been compiled in a systematic fashion (Jessup et al., 2024a; Jessup et al., 2024c). The analysis examines prevalence (frequency) rates for variables measured as Present or Absent and several metrics for counts of grave goods to assess abundance (c.f., Chapter 5). However, for the reasons mentioned earlier, the χ^2 and Fisher tests, both frequently used to compare contingency tables, are not employed.

While a very large number of contingency tables and descriptive statistics have been generated to search for meaningful patterns, in order to save space and to make the discussion more transparent, only the most essential tables are presented. All other quantitative metrics referred to in the analysis can be verified using data from Jessup et al., 2024a and Jessup et al., 2024c. To make the size of the tables as small as possible, units of analysis with no data in them are omitted entirely (see relevant table captions for

additional information). Since Group 2–L and Group 4, both from Phase 1, are very small samples, the analysis focuses on the larger Groups 1, 2, and 3 from Phase 1 and Group 5 from Phase 2.

As mentioned earlier, the complex structure of the Shamanka II dataset offers an opportunity to examine many different units of analysis. However, examination of all potentially practical units would be substantially beyond the scope of this monograph and, therefore, these chapters are limited to those units that are considered of primary interest to general archaeological readership. Nonetheless, the data in the GAI Supplements (Jessup et al., 2024a; Jessup et al., 2024c) allow interested scholars to expand this examination in many directions.

The analysis progresses from general to specific both with regard to unit of analysis (cemetery → phase → MUA) and how the grave goods are grouped (all grave goods → five main groups together → five main groups separately → ornaments separately). Insights from examination at the higher levels of generalization will be useful for comparisons with other prehistoric hunter–gatherer cemeteries within Cis-Baikal as well as across northern Eurasia (e.g., Olenii Ostrov in Karelia, Zvejnieki in Latvia, Skateholm and Vedbæk in southern Scandinavia; Albrethsen and Brinch Petersen, 1976; Gurina, 1956; Jacobs, 1995; Larsson, 1988; Larsson and Zagorska, 2006; O'Shea and Zvelebil, 1984) and even beyond (e.g., Téviec and Hoëdic in northwestern France; Péquart and Péquart 1954; Péquart et al., 1937). Comparisons at the intermediate levels will be valuable to those interested in the history of the EN Kitoi cultural pattern, while assessment at the levels of greatest specificity will provide even more details about mortuary variation at the Shamanka II cemetery. The most specific comparisons are limited to Groups 1, 2, 3, and 5. Whenever practical, the larger units are also analyzed by sex of the burials. Quantitative data for Groups 2–L and 4 are included in the tables but rarely discussed further because both are very small samples.

Chapter 4. Variation in the treatment of the dead: Grave and Burial Levels

Andrzej W. Weber, Vladimir I. Bazaliiskii, Erin Jessup

With the analytical approach already presented, this chapter begins the review of mortuary variation documented at Shamanka II for the Grave and Burial Levels of analysis.

1. Mortuary variation at the Grave Level

Analysis of the Grave Level opens with presentation of the number of graves and their distribution across the cemetery and then moves on to the assessment of grave condition and other variables selected for examination.

1.1. Number and spatio-temporal distribution of graves

The spatial distribution of graves has already been presented to some extent and is clearly uneven across the cemetery with 23 graves in the NW Cluster, 50 graves in the SE Cluster, and 24 graves in the S Cluster (Table 3.2). All three clusters feature the two grave formations: Rows and Scattered. While the NW and SE Clusters both have about twice as many row graves as scattered, the S Cluster is balanced in this regard (Table 3.1; Fig. 2.1).

The temporal distribution of graves is also very uneven with 83 (86%) graves built during Phase 1, of which 7 (7%) were reused in Phase 2, and only 10 (10%) built during Phase 2. Since most graves were built in Phase 1, their spatial distribution is essentially proportional to the size of each cluster but the distribution of Phase 2 graves is different: the NW Cluster has only 1 Phase 2 grave while the SE and S Clusters are about the same with 5 and 4 graves, respectively (in contrast to the uneven numbers of Phase 1 graves in these two spatial units). Interestingly, none of the 20 NW Cluster Phase 1 graves, many of them containing children, were reused in Phase 2.

Only a few additional observations are needed regarding grave formation within the MUAs because most of them are in part defined on the basis of formation as presented in Chapter 3. Group 5 (Phase 2 graves), however, includes both row and scattered graves from all three clusters. Even though there are only 10 graves built during Phase 2, 3 of these were added to rows established during Phase 1 (1 in each cluster of the cemetery) and 7 were scattered (4 in the SE Cluster and 3 in the S Cluster). In other words, no new rows were established during Phase 2.

In Group 1, only Row C (NW Cluster) and Row J (S Cluster) have 5 or more graves, but in Group 2 there are 4 rows with 5 or more graves (E, F, G, and H) for a total of

21 graves (34% of all row graves). Including the 6 graves that lack radiocarbon data but also belong to rows F and G, the number increases to 27 (44%). In sum, this area of the cemetery has the highest concentration of graves arranged into rows and none of these rows appear to have been expanded during Phase 2. Lastly, 11 rows (with 55 graves) run in the NW–SE direction and 2 (with 7 graves) run NE–SW. The rows with the atypical NE–SW orientation are located on the NE (Row L) and SW (Row K) boundaries (i.e., opposite ends) of the cemetery.

1.2. Grave Condition

Three variables describe the condition of the graves at Shamanka II: Condition, Disturbance Pattern, and EN Disturbance Pattern. The first categorizes graves in general terms only as either Intact or Disturbed. Intact graves show no archaeologically recognizable disturbances to the physical integrity of the grave while Disturbed graves show evidence of disturbances of some kind, further categorized under EN Disturbance Pattern (c.f., Jessup et al., 2024a; Jessup et al., 2024b).

The EN Disturbance Pattern categorizes only disturbances that are believed to have been inflicted around the time of cemetery use by the Kitoi people and is the main focus of attention here (Table 4.1). The following categories of EN Disturbances have been identified:

- Intact: no archaeologically recognizable cultural disturbances to the physical integrity of the grave;
- Grave Cut: grave disturbed by excavation of another EN grave; and
- Reopening: grave disturbed by reopening for mortuary or other purposes.

Examination of the EN Disturbances by MUA (Fig. 4.1; Table 4.2) allows for a few observations:

- Despite the high density of graves in some areas (e.g., the SE Cluster) Grave Cut disturbances are rare (3, 3%);
- Of the two types of EN grave disturbance, Reopening (43, 44%) is by far more common while a good half (49, 51%) of graves are considered Intact;
- Of the 83 graves constructed during Phase 1, 28 (34%) were Reopened during Phase 1 and an additional 7 (8%) were opened during Phase 2, 3 of which (Gr. 23, 26, and 50) were likely opened first in Phase 1;[21]
- The proportion of Reopened graves in the three larger Phase 1 groups (Groups 1, 2, and 3) are about the same (39–43%); and
- Most graves in Group 5 (Phase 2) are intact (7, 70%) but the number of Reopened graves (3, 30%) is not insignificant.

Table 4.1. Shamanka II: Grave condition (EN Disturbances)

EN Disturbance Pattern	Count	Percentage
Intact	49	51%
Grave Cut	3	3%
Reopening	43	44%
m.d.	2	2%
Total	97	100%

[21] Four graves (Nos. 20, 25, 48, and 52) did not provide enough radiocarbon information to assess this matter.

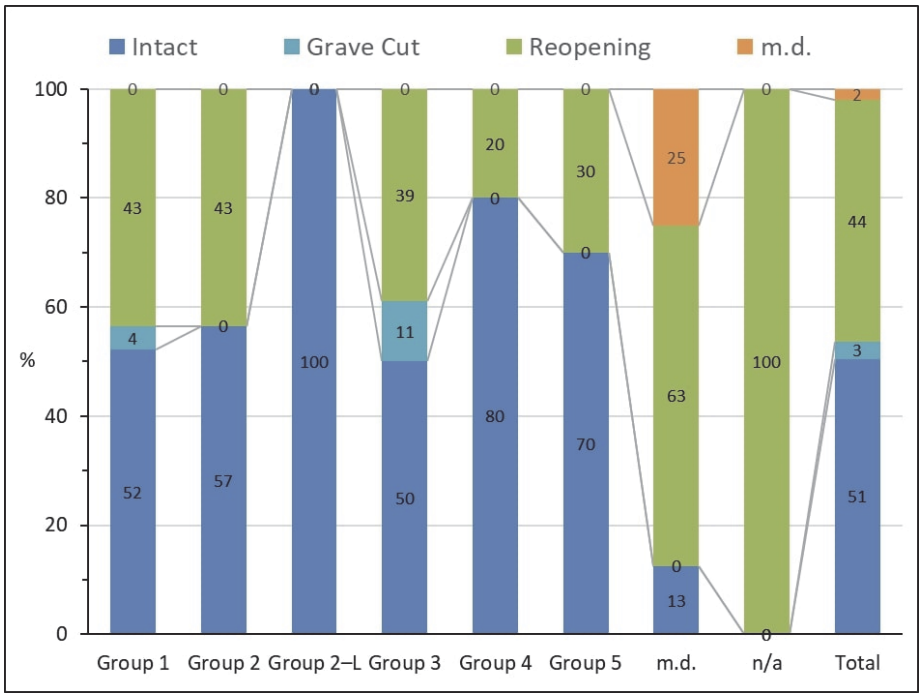


Figure 4.1. Shamanka II, EN Disturbances by Main Unit of Analysis (after Table 4.2). Figure by chapter authors

Table 4.2. Shamanka II: EN Disturbances by Main Unit of Analysis. Note: "0" values have been removed

MUA	Intact	Grave Cut	Reopening	m.d.	Row Total
Group 1	12 (52%)	1 (4%)	10 (43%)		23 (100%)
Group 2	13 (57%)		10 (43%)		23 (100%)
Group 2–L	3 (100%)				3 (100%)
Group 3	9 (50%)	2 (11%)	7 (39%)		18 (100%)
Group 4	4 (80%)		1 (20%)		5 (100%)
Group 5	7 (70%)		3 (30%)		10 (100%)
m.d.	1 (13%)		5 (63%)	2 (25%)	8 (100%)
n/a			7 (100%)		7 (100%)
Total	49 (51%)	3 (3%)	43 (44%)	2 (2%)	97 (100%)

1.3. Number of Burials

Due to the nature of post-burial EN disturbances, identifying the number of interred individuals in a grave is not a simple matter. At Shamanka II, a relatively large number of burials are incomplete and disarticulated to varying degrees (see Sections 2.6 and 2.7). Thus, the entire relevant archaeological context was examined to decide which skeletal elements represent individuals originally interred in a grave (and later disturbed) and which are foreign elements that were introduced (accidentally or intentionally) at some point in the past. In cases where only a few elements survived, factors such as articulation and location within the grave were evaluated to determine whether they represented an original interment and should be counted as a distinct individual. For example, the articulated right lower leg and foot bones found in Grave 26 were considered to represent a distinct burial (Burial 26.01; Fig. 4.2) but the scattered hand, foot, and rib bones found in Grave 49 (Fig. 4.3) were not. Grave descriptions provide all relevant information on this matter and the results of the decisions made (Bazaliiskii et al., 2024).

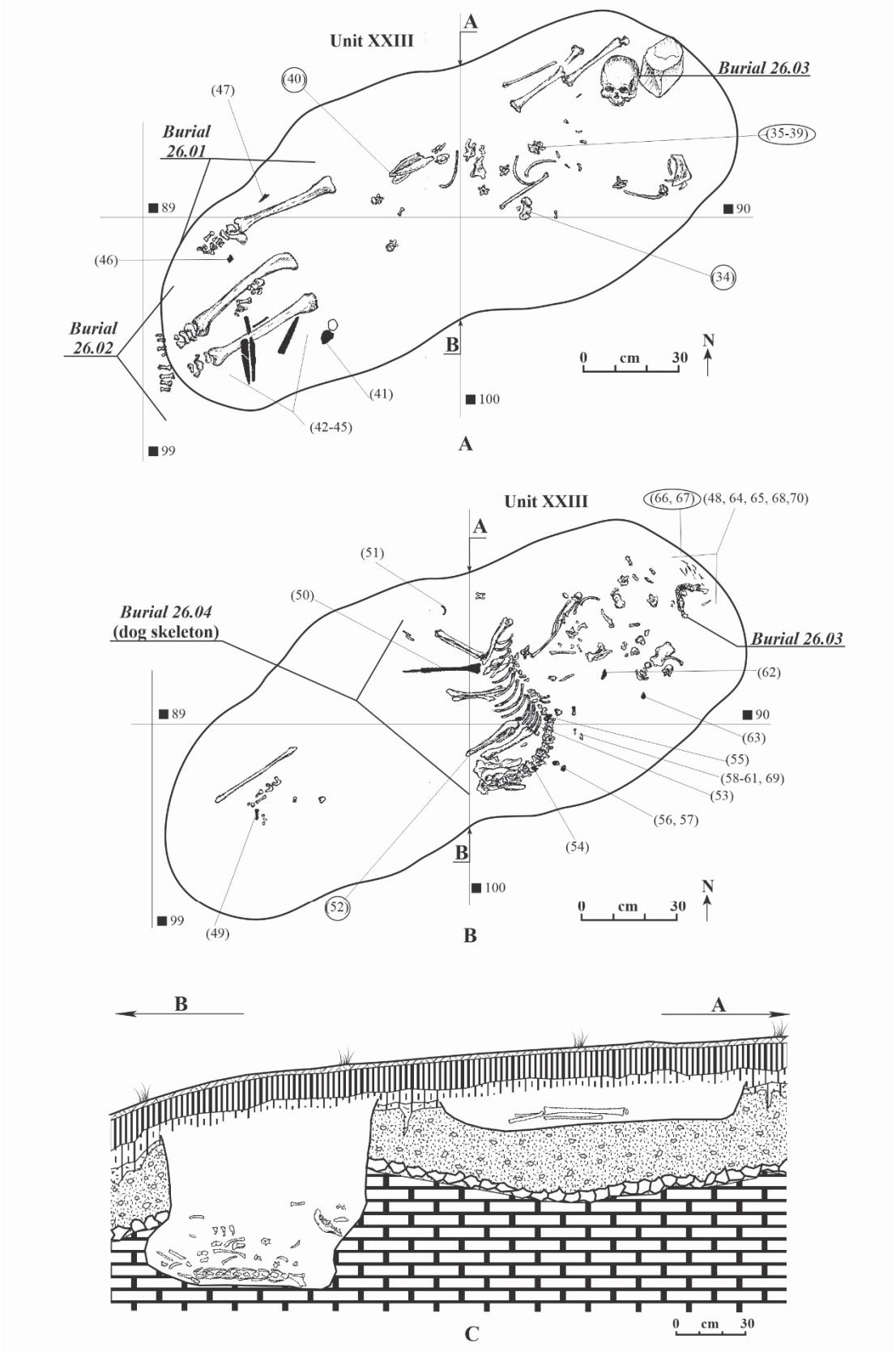


Figure 4.2. Shamanka II, Grave 26. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii:

A. Floor plan
B. Floor plan
C. Longitudinal-section

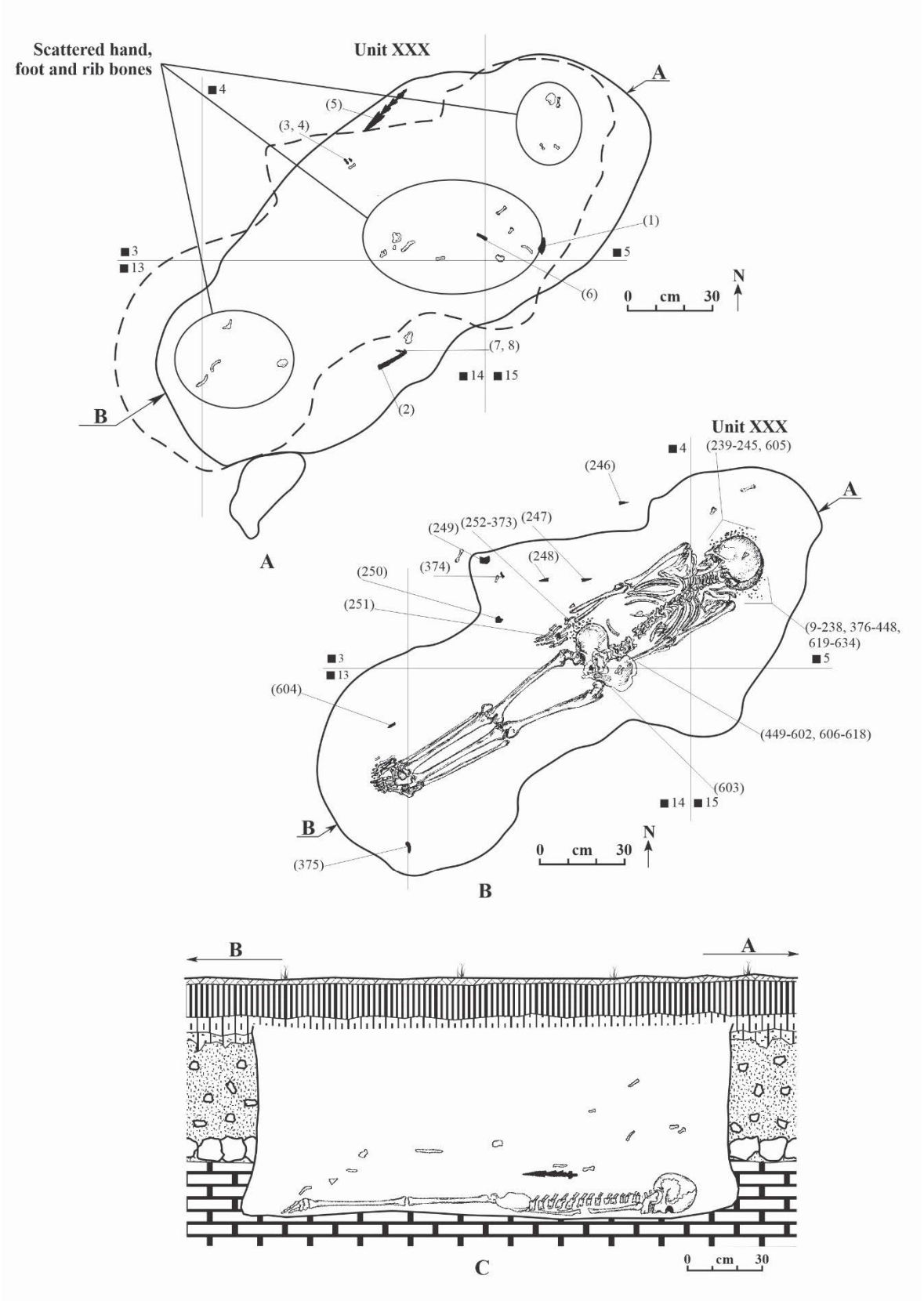


Figure 4.3. Shamanka II, Grave 49. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii:

A. Floor plan
B. Floor plan
C. Longitudinal-section

Once the matter of incomplete and disarticulated burials is addressed, the number of individuals per grave can be tabulated. At the scale of the entire cemetery, 63 graves (65%) have only 1 burial (40% of all burials) and 34 graves (35%) have more than one individual for a total of 93 burials (60% of all burials). The highest number of burials in a grave is 5 and there are 3 (3%) such graves (Table 4.3). Graves with 1 or 2 burials account together for 86% (83) of all graves and 66% (103) of all burials. In sum, while graves with more than one burial account roughly for one-third of all graves, they provide almost two-thirds of all burials (Fig. 4.4).

Table 4.3. Shamanka II: Number of burials in graves

Burials in grave	No. of graves	% of graves	No. of burials	% of burials
1	63	65%	63	40%
2	20	21%	40	26%
3	6	6%	18	12%
4	5	5%	20	13%
5	3	3%	15	10%
Total	97	100%	156	100%

This distribution, however, looks somewhat differently when analyzed by MUA (Fig. 4.5; Table 4.4). During Phase 1, graves with only 1 burial dominate Group 1 (20, 87%), while in Groups 2 and 3 graves with more than 1 interment are more common (10, 43% and 6, 34%, respectively). Group 4, although a small sample, contains only graves with single interments. Group 2–L, an even smaller sample, has 2 graves with single burial and 1 with double. Group 5 graves (Phase 2) are exclusively either single (7, 70%) or double (3, 30%) burials.

Table 4.4. Shamanka II: Number of burials in graves by Main Unit of Analysis. Note: "0" values have been removed

MUA	1 burial	2 burials	3 burials	4 burials	5 burials	Row Total
Group 1	20 (87%)	2 (9%)		1 (4%)		23 (100%)
Group 2	13 (57%)	5 (22%)	4 (17%)		1 (4%)	23 (100%)
Group 2–L	2 (67%)	1 (33%)				3 (100%)
Group 3	12 (67%)	4 (22%)	1 (6%)	1 (6%)		18 (100%)
Group 4	5 (100%)					5 (100%)
Group 5	7 (70%)	3 (30%)				10 (100%)
m.d.	4 (50%)	1 (13%)		2 (25%)	1 (13%)	8 (100%)
n/a		4 (57%)	1 (14%)	1 (14%)	1 (14%)	7 (100%)
Total	63 (65%)	20 (21%)	6 (6%)	5 (5%)	3 (3%)	97 (100%)

Assessment of the number of individuals per grave in the context of EN Disturbances allows for a few additional observations. One-third (33%) of graves with 1 burial were Reopened, which is a large proportion, but an even larger proportion (65%) of graves with 2 or more burials were Reopened and 100% of graves with 4 or 5 interments were Reopened (Fig. 4.4.C; Fig. 4.20.B). The small number of graves with 3 or more burials limits comparison by MUA but restricting assessment to graves with 1 or 2 interments shows that Groups 1, 2, and 3 (i.e., those with a sufficient number of graves) are about the same. No other patterns are discernible.[22]

[22] Obviously, in graves with multiple burials grave Reopening could be related to the interment of subsequent individuals. This matter is addressed below under the Vertical Arrangement of Burials (Section 1.5).

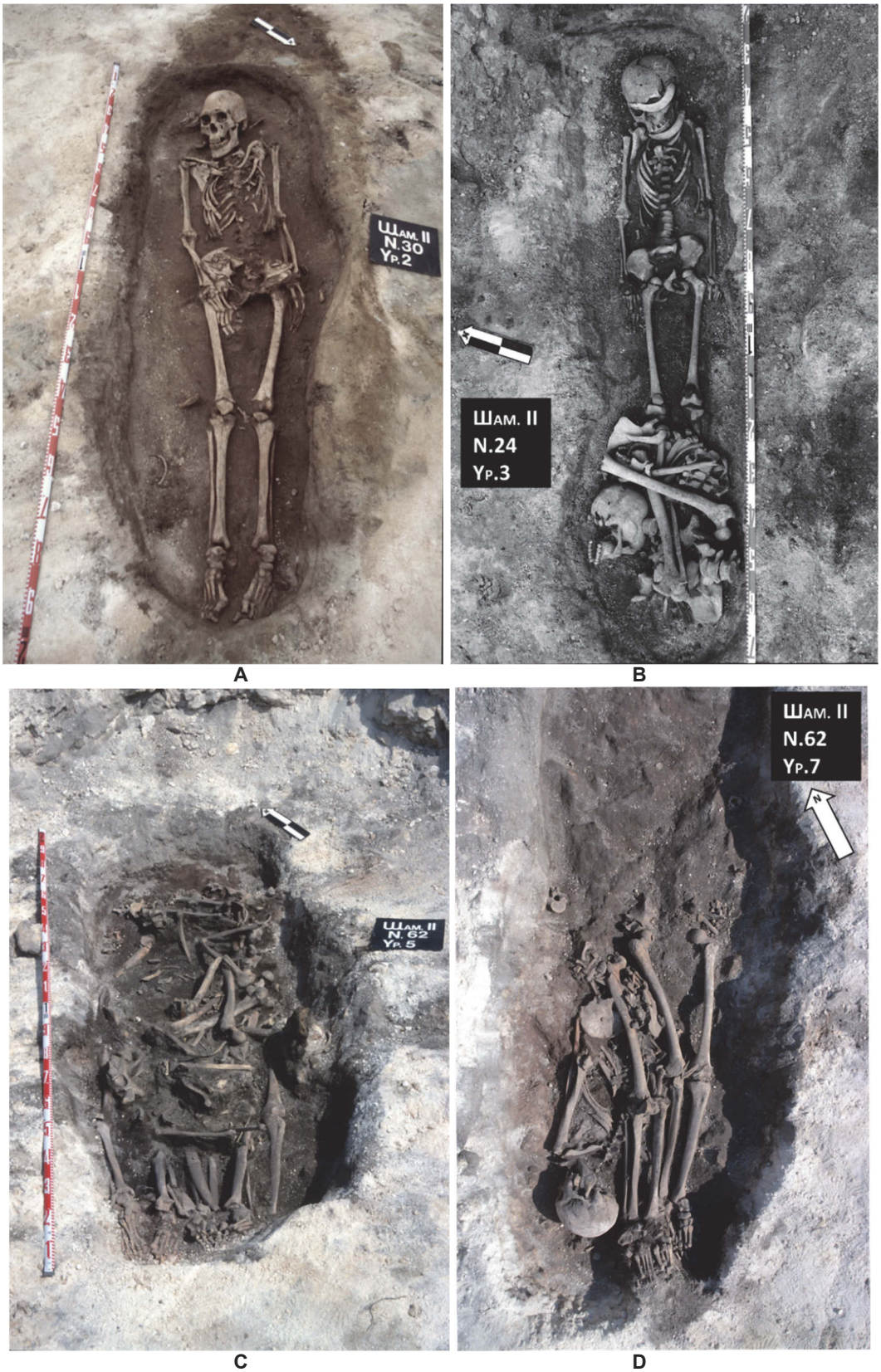


Figure 4.4. Shamanka II, Graves with different numbers of burials. Figure by the BAP:

A. Grave 30 with one burial
B. Grave 24 with one Primary and one Secondary burial
C. Grave 62 with five burials, upper level
D. Grave 62 with five burials, lower level

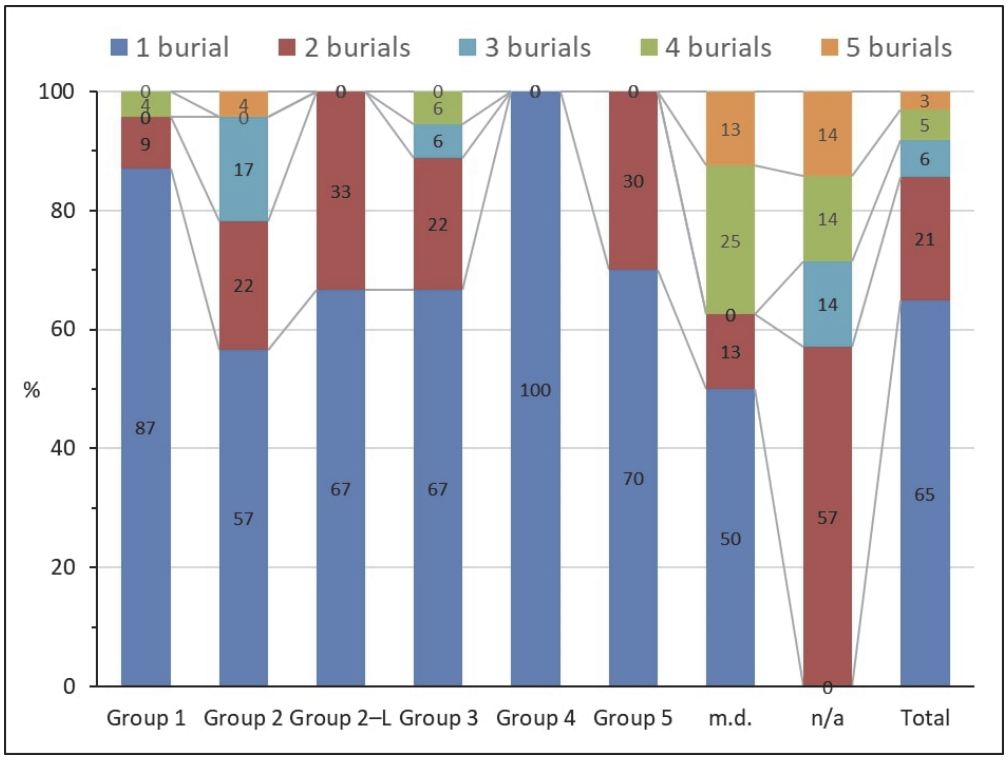


Figure 4.5. Shamanka II, Number of burials in graves by Main Unit of Analysis (after Table 4.4). Figure by chapter authors

1.4. Demographic structure of graves

With so many graves at Shamanka II containing more than 1 individual (34, 35%) and an even larger proportion of all burials (93, 60%) coming from such graves, it is practical to look at the Age and Sex Structure of these graves. The matter is presented as briefly as possible because more attention will be paid to it at the Burial Level of analysis (Section 2.1).

The age of all identified burials was estimated using methods described in Lieverse et al., 2024 with the results presented in Tables S.2 and S.3. As explained in Chapter 3, for the goals of this examination, the original age determinations have been reduced to the following four broad General Age categories: Young Child, Old Child, Adolescent, and Adult. Using these four age groups the Age Structure of each grave was categorized in the following manner:

- Child: a grave containing only a child or children (Young, Old or both);
- Adolescent: a grave containing only Adolescent(s);
- Adult: a grave containing only Adult(s);
- Mixed: a grave with burials showing any combination of these three age groups; and
- Adolescent–Adult: Grave 98 (c.f., Chapter 3, Section 2.3; Fig. 4.6).

Adult graves are the most numerous category (61, 63%; Table 4.5) but Child graves are not uncommon (19, 20%) or, at least, are more common than at most other Middle Holocene cemeteries in the Cis-Baikal region (Bronk Ramsey et al., 2021; Tiutrin and Bazaliiskii, 1996).[23] Adolescent graves are rare (3, 3%).

[23] The LN Isakovo Ust'-Ida I cemetery on the Angara is one notable exception to this general pattern (Tiutrin and Bazaliiskii, 1996).

Figure 4.6. Shamanka II, Grave 98: The silhouette of a burial is visible via the discolouration of the sediment. No organic material survived

Table 4.5. Shamanka II: Grave Age structure

Grave Age Structure	Count	Percentage
Child	19	20%
Adolescent	3	3%
Adult	61	63%
Mixed	14	14%
Total	97	100%

This distribution is somewhat different within the MUAs (Fig. 4.7; Table 4.6). In Group 1, Child graves are a lot more common (8, 35%) relative to the other MUAs and account for 42% of all Child graves at the cemetery while Mixed graves are fewest (1, 4%). Group 2 has the lowest number of Child graves (1, 4%) and the highest number of Mixed graves (5, 22%). Although Groups 1 and 2 have the same number of graves (23), the Age Structure of their graves is quite different. Proportions of Adult graves are roughly similar in all groups (56–80%) and Adolescent graves are rare in all groups.

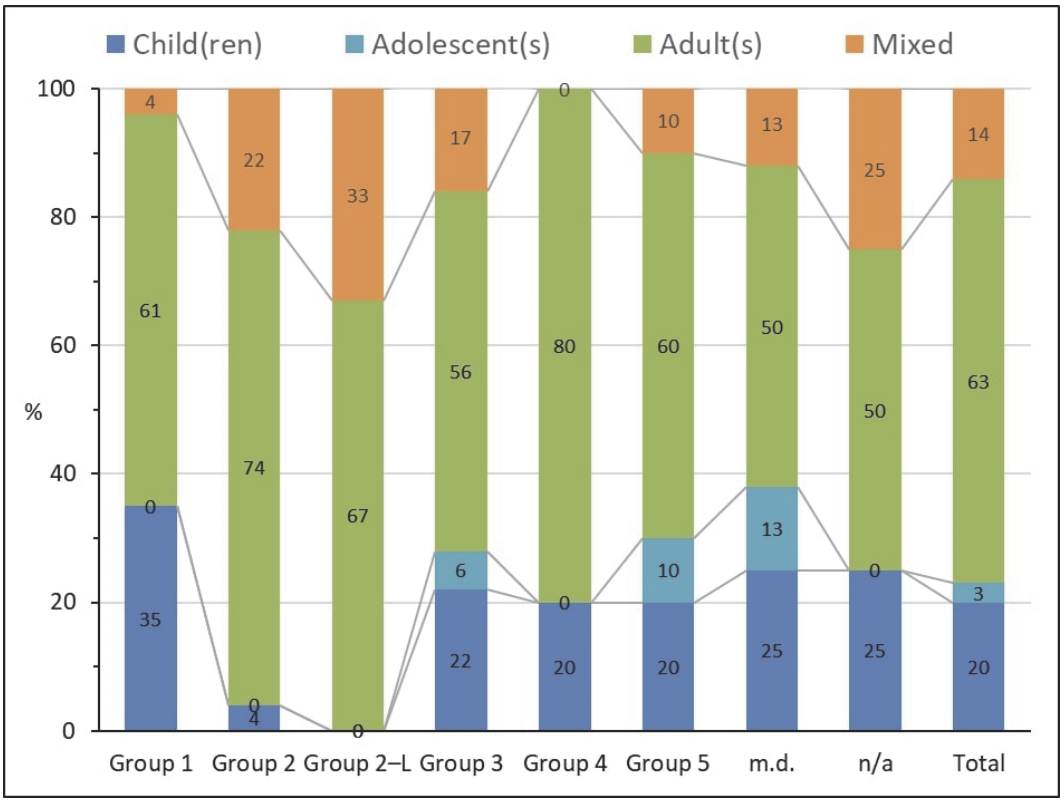


Figure 4.7. Shamanka II, Grave Age structure by Main Unit of Analysis (after Table 4.6). Figure by chapter authors

The sex of all identified individuals was estimated using methods described in Lieverse et al., 2024 with the original determinations presented in Tables S.2 and S.3. As with the age categories, the sex designations have been reduced to the following four categories: Female, Male, Undetermined Adult (i.e., Adolescent and Adult), and Undetermined Child (Young and Old). Based on this, the Sex Structure of the excavated graves has been categorized as follows:

- Undetermined Child(ren);
- Female(s);
- Male(s);
- Undetermined Adult(s);
- Female(s) + Male(s);
- Female(s) + Undetermined Child(ren);
- Female(s) + Undetermined Adult(s);
- Female(s) + Undetermined Child(ren) + Undetermined Adult(s);
- Male(s) + Undetermined Child(ren);
- Male(s) + Undetermined Adult(s);
- Male(s) + Undetermined Child(ren) + Undetermined Adult(s);
- Undetermined Adult(s) + Undetermined Child(ren);
- Female(s) + Male(s) + Undetermined Child(ren);
- Female(s) + Male(s) + Undetermined Adult; and
- Fmale(s) + Male(s) + Undetermined Child(ren) + Undetermined Adult(s).

Table 4.6. Shamanka II: Grave Age structure by Main Unit of Analysis. Note: "0" values have been removed

MUA	Child(ren)	Adolescent(s)	Adult(s)	Mixed	Row Total
Group 1	8 (35%)		14 (61%)	1 (4%)	23 (100%)
Group 2	1 (4%)		17 (74%)	5 (22%)	23 (100%)
Group 2–L			2 (67%)	1 (33%)	3 (100%)
Group 3	4 (22%)	1 (6%)	10 (56%)	3 (17%)	18 (100%)
Group 4	1 (20%)		4 (80%)		5 (100%)
Group 5	2 (20%)	1 (10%)	6 (60%)	1 (10%)	10 (100%)
m.d.	2 (25%)	1 (13%)	4 (50%)	1 (13%)	8 (100%)
n/a	2 (25%)		4 (50%)	2 (25%)	8 (100%)
Total	19 (20%)	3 (3%)	61 (63%)	14 (14%)	97 (100%)

This large number of categories is a direct product of the considerable number of graves with multiple interments and sizeable number of adult individuals of undetermined sex. Together, these two factors generate many sex configurations which has the potential to clutter and muddle analysis. Initial evaluation of the Grave Age Structure shows that a few categories are not represented at all and others are very rare. Grouping the rare configurations into a single category ("Other"), allows for the focusing of attention on the more numerous categories to search for meaningful patterns (Table 4.7).

Table 4.7. Shamanka II: Grave Sex structure

Sex categories	Count	Percentage
Undetermined Child(ren)	19	20%
Female(s)	14	14%
Male(s)	39	40%
Female(s) & Male(s)	7	7%
Female(s) & Undetermined Child(ren)	3	3%
Male(s) & Undetermined Child(ren)	4	4%
Other	11	11%
Undetermined Adult(s)	1	1%
Female(s) & Undetermined Adult(s)	1	1%
Male(s) & Undetermined Adult(s)	3	3%
Male(s) & Undetermined Child(ren) & Undetermined Adult(s)	1	1%
Female(s) & Male(s) & Undetermined Child(ren)	1	1%
Female(s) & Male(s) & Undetermined Adult(s)	3	3%
Female(s) & Male(s) & Undetermined Child(ren) & Undetermined Adult(s)	1	1%
Total	97	100%

Since females are greatly underrepresented in the sex structure of the entire Shamanka II cemetery population (Table 3.4), it is not surprising that Female graves (i.e., with one or more females only) are about one third as common (14, 14%) as Male graves (i.e., with one or more males only; 39, 40%; Table 4.7). It is interesting that Child(ren) graves (i.e., with one or more children only) are relatively common (19, 20%), and that the frequency of the next two most common configurations with children — Female(s) + Child(ren) (3, 3%) and Male(s) + Child(ren) (4, 4%) — are about the same. Relative to the overall number of Female and Male interments (Table 3.4), 8% of Females (3 of 38) and 5% of Males (4 of 74) were interred with children. Children are rare in the other sex configurations which typically involve more than three burials in a grave (Fig. 4.8).

The distribution of Grave Age Structure categories is quite uneven when analyzed by MUA (Fig. 4.9; Table 4.8). Child graves are the most common of all sex categories in Group 1 (8, 35%) and the least common in Group 2 (1, 4%). Male graves dominate Group 2 (12, 52%) and Female graves are in the minority everywhere, though in Groups 1, 3, and 5 they are more than twice as common as in Group 2. The prevalence of graves with the sex configurations grouped as Other is about the same in all groups. In sum, Group 2 is dominated by Male graves while Groups 1, 3, and 5 are relatively similar and balanced.

Figure 4.8. Shamanka II, Graves with different Sex Structures. Figure by the BAP:

A. Grave 57 with two Female burials
B. Grave 53 with two Male burials
C. Grave 67 with one Child burial
D. Grave 60 with one Female (left, skull absent Post-burial) and one Male (right, skull absent Peri-burial) burial
E. Grave 66 with one Female and one Child burial
F. Grave 69 with two Female burials and one Child burial

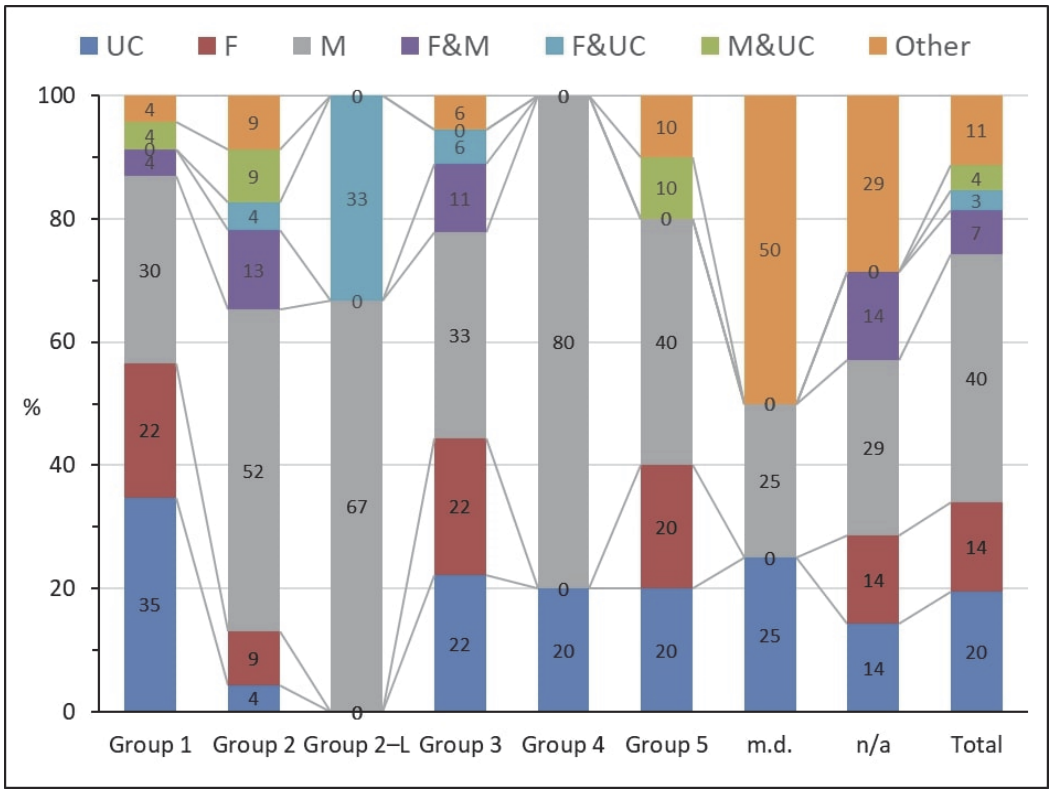


Figure 4.9. Shamanka II, Grave Sex structure by Main Unit of Analysis (after Table 4.8). UC=Undetermined Child(ren); F=Female(s); M=Male(s); F&M=Female(s) & Male(s); F&UC=Female(s) & Undetermined Child(ren); M&UC=Male(s) & Undetermined Child(ren). Figure by chapter authors

1.5. Vertical and Horizontal Arrangement of burials

The large number of graves with more than one individual requires an assessment of the Vertical and Horizontal Arrangement of these burials relative to one another. There are three basic kinds of Vertical Arrangement:

- Same Level: burials are interred next to one another;
- Stacked: burials are interred immediately on top of one another without an intervening layer of sediment between them; and
- Layered: burials are separated from one another by an intervening layer of sediment.

The interment of burials on the Same Level and Stacked implies, at least tentatively, that they were disposed of at the same time, while the Layered arrangement suggests a gap of time between burial events, although exceptions are, of course, possible. Since many graves have more than two individuals, several different combinations of these three basic arrangements are possible, which, for the purpose of this analysis, have been grouped in the following way:

- Same and/or Stacked (implying synchronous burial), which combines graves with burials categorized as interred on the Same Level, Stacked, or Stacked & Same Level; and
- Layered (implying asynchronous burial), which includes graves with interments believed to be arranged as Layered, Stacked & Layered, or Same Level & Layered.

Table 4.8. Grave Sex structure by Main Unit of Analysis. UC=Undetermined Child(ren); F=Female(s); M=Male(s); F&M=Female(s) & Male(s); F&UC=Female(s) & Undetermined Child(ren); M&UC=Male(s) & Undetermined Child(ren). Note: "0" values have been removed

MUA	UC	F	M	F&M	F&UC	M&UC	Other	Row Total
Group 1	8 (35%)	5 (22%)	7 (30%)	1 (4%)		1 (4%)	1 (4%)	23 (100%)
Group 2	1 (4%)	2 (9%)	12 (52%)	3 (13%)	1 (4%)	2 (9%)	2 (9%)	23 (100%)
Group 2–L			2 (67%)		1 (33%)			3 (100%)
Group 3	4 (22%)	4 (22%)	6 (33%)	2 (11%)	1 (6%)		1 (6%)	18 (100%)
Group 4	1 (20%)		4 (80%)					5 (100%)
Group 5	2 (20%)	2 (20%)	4 (40%)			1 (10%)	1 (10%)	10 (100%)
m.d.	2 (25%)		2 (25%)				4 (50%)	8 (100%)
n/a	1 (14%)	1 (14%)	2 (29%)	1 (14%)			2 (29%)	7 (100%)
Total	19 (20%)	14 (14%)	39 (40%)	7 (7%)	3 (3%)	4 (4%)	11 (11%)	97 (100%)

Table 4.9. Shamanka II: Vertical Arrangement of burials

Vertical Arrangement	Count	Percentage
Same and/or Stacked	17	50%
Same Level	5	15%
Stacked	7	21%
Same Level & Stacked	5	15%
Layered	8	24%
Layered	6	18%
Same Level & Layered	1	3%
Stacked & Layered	1	3%
m.d.	9	26%
Total	34	100%

Same and/or Stacked arrangements are the most frequent (17, 50%) while Layered configurations are much less common (8, 24%; Table 4.9). However, in a relatively large number of graves the vertical position of burials could not be defined (9, 26%).

Examination by MUA shows an uneven distribution of these two kinds of Vertical Arrangements (Fig. 4.10; Table 4.10). Group 1 has only 3 graves with multiple burials so not much can be said about them in this regard. Same and/or Stacked (implying synchronous interment) is by far the most common in Group 2 (7, 70%) and Group 3 (5, 83%), while Layered (implying asynchronous interment) is the most frequent in Group 5 (2, 67%). From Phase 1, only Grave 21 (Group 2) has Layered burials, with two interments side-by-side at the bottom of the grave and one above, separated by a layer of sediment 0.02–0.17 m thick. This grave is particularly interesting because it seems intact, that is, the lower burials do not appear to have been disturbed by the interment of the upper individual (Fig. 4.11).

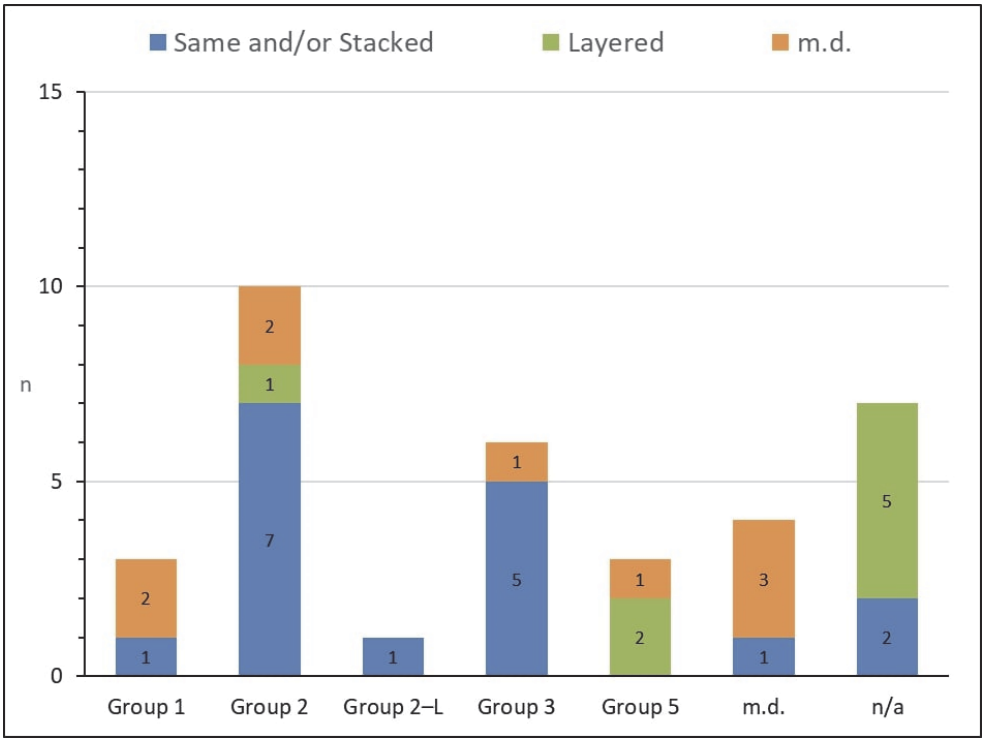


Figure 4.10. Shamanka II, Vertical Arrangement of burials by Main Unit of Analysis (after Table 4.10). Zeros have been removed for readability. Figure by chapter authors

Table 4.10. Shamanka II: Vertical Arrangement of burials by Main Unit of Analysis. Note: "0" values have been removed

MUA	Same and/or Stacked	Layered	m.d.	Row Total
Group 1	1 (33%)		2 (67%)	3 (100%)
Group 2	7 (70%)	1 (10%)	2 (20%)	10 (100%)
Group 2–L	1 (100%)			1 (100%)
Group 3	5 (83%)		1 (17%)	6 (100%)
Group 5		2 (67%)	1 (33%)	3 (100%)
m.d.	1 (25%)		3 (75%)	4 (100%)
n/a	2 (29%)	5 (71%)		7 (100%)
Total	17 (50%)	8 (24%)	9 (26%)	34 (100%)

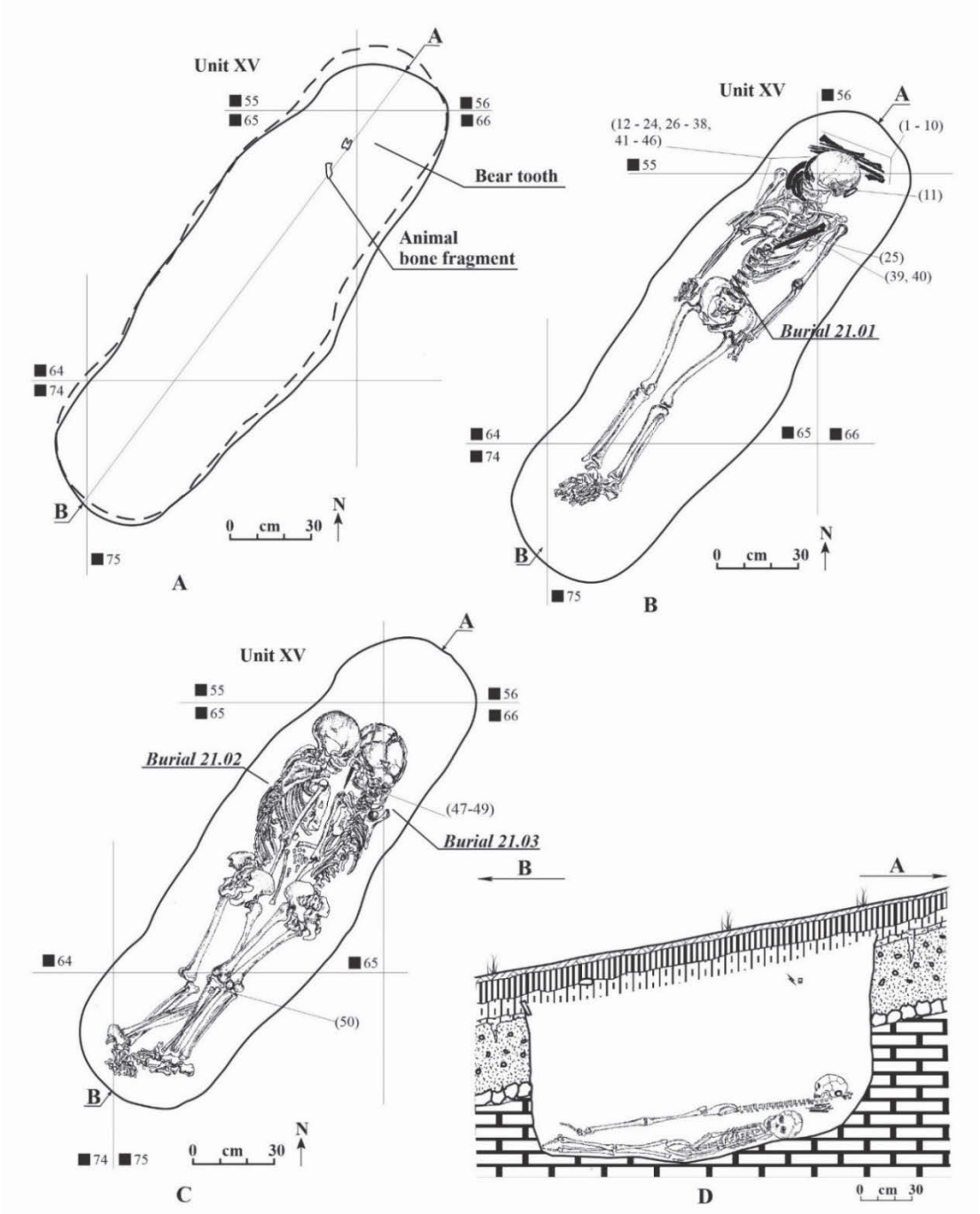


Figure 4.11. Shamanka II, Grave 21. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii:

A. Floor plan
B. Floor plan
C. Floor plan
D. Longitudinal-section

Although there are only 3 graves with multiple burials in Group 5, the fact that 2 of them are Layered is interesting because it represents asynchronous burial during Phase 2, which was much shorter than Phase 1. It might be that had Phase 2 lasted longer, these graves would have been reopened again and disturbed even more. In seven additional instances graves built during Phase 1 (Gr. 23, 26, 42, 44, 50, 56, and 59) were reopened during Phase 2 and new burials were added. This resulted in both kinds of vertical placement: 2 graves with Same and/or Stacked burials and 5 with Layered. Because these seven graves

span both phases of cemetery use, they cannot be assigned to a MUA and are referred to as "n/a" in Table 4.10. In sum, Groups 2 and 3 are similar while Groups 1 and 5 are different from them but also different from one another.

The Horizontal Arrangement describes graves with two or more burials in terms of their head direction relative to one another:

- Head-to-Head: burials are placed with heads pointing in the same direction (Fig. 4.8.D–F);
- Head-to-Toe: burials are placed with heads pointing in opposite directions; and
- Head-to-Head & Head-to-Toe: both arrangements are present (applicable only to graves with three or more interments; Fig. 4.4.D).

In a relatively large number of the 34 graves with multiple burials, the horizontal placement could not be established (8, 24%). Of those that could, the Head-to-Head arrangement is the most common (18, 53%; Table 4.11), and the Head-to-Toe placement is relatively rare (5, 15%) despite being frequently cited as a uniquely Kitoi pattern among Middle Holocene mortuary traditions in Cis-Baikal. Examination of variation by MUA shows an equal dominance of the Head-to-Head position in Groups 1, 2, and 3 (67–70%). Of the 5 graves with the Head-to-Toe placement of burials, all of which are in the SE Cluster, 1 belongs to Group 2 and 4 remain unassigned (Fig. 4.12; Table 4.12).

Table 4.11. Shamanka II: Horizontal Arrangement of burials

Horizontal Arrangement	Count	Percentage
Head-to-Head	18	53%
Head-to-Toe	3	9%
Head-to-Head & Head-to-Toe	2	6%
Other	3	9%
m.d.	8	24%
Total	34	100%

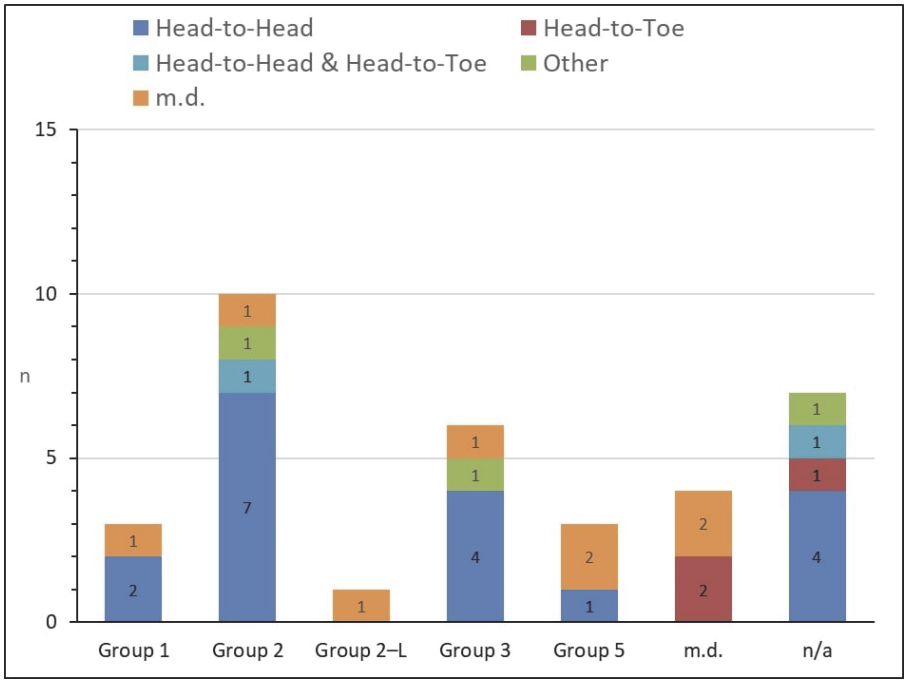


Figure 4.12. Shamanka II, Horizontal Arrangement of burials by Main Unit of Analysis (after Table 4.12). Zeros have been removed for readability. Figure by chapter authors

Table 4.12. Shamanka II: Horizontal Arrangement of burials by Main Unit of Analysis. Note: "0" values have been removed

MUA	Head-to-Head	Head-to-Toe	Head-to-Head & Head-to-Toe	Other	m.d.	Row Total
Group 1	2 (67%)				1 (33%)	3 (100%)
Group 2	7 (70%)		1 (10%)	1 (10%)	1 (10%)	10 (100%)
Group 2–L					1 (100%)	1 (100%)
Group 3	4 (67%)			1 (17%)	1 (17%)	6 (100%)
Group 5	1 (33%)				2 (67%)	3 (100%)
m.d.		2 (50%)			2 (50%)	4 (100%)
n/a	4 (57%)	1 (14%)	1 (14%)	1 (14%)		7 (100%)
Total	18 (53%)	3 (9%)	2 (6%)	3 (9%)	8 (24%)	34 (100%)

Considering the Vertical and Horizontal Arrangements together, there is not much difference between Groups 2 and 3. Group 1 seems to be a little different from them, perhaps because it includes many child graves. In Group 5, there are no Same and/or Stacked arrangements but the number of graves in this category is very small (n = 3) of which 2 are Layered.

1.6. Summary of mortuary variation at the Grave Level

At Shamanka II, the Phase 2 dead lack any kind of spatial identity, a point worth stressing because the area around the cemetery still had enough land to accommodate them as a separate spatial cluster. Instead, individuals were buried within the spatial arrangements (sectors, clusters and, in some cases, rows, and even graves) established during Phase 1, as if to emphasize cultural continuity over chronological discontinuity. In contrast, Rows K and L from Phase 1 are the only rows with a NE–SW orientation and yet are located at opposite ends of the cemetery as if to keep them clearly apart. Both spatial arrangements are obviously deliberate and both beg a question as to "Why?"

The SE Cluster of the cemetery features the highest density of graves. In Phase 1, some were arranged into rows (Group 2) and others were scattered (Group 3), containing individuals that probably practiced fishing employing somewhat different techniques (c.f., Chapters 2 and 7), both resulting in a gradually increasing reliance on fish for food. Despite this high density, the number of graves disturbed by the subsequent construction of Kitoi graves is low in the SE Cluster and across the entire cemetery. Instead, graves were frequently reopened, perhaps more than once, not only to inter new dead but also to perform other acts of mortuary ritual (c.f., Chapter 6). In some instances, these activities did not affect the physical structure of the graves to the extent that they were discernible archaeologically. This suggests two points: (1) that graves were somehow marked and clearly visible on the surface to guide additional interments and other subsequent mortuary activities; and (2) that in many instances it was more important for these Kitoi people to add their dead to existing graves rather than to bury them in new graves.

At Shamanka II, a large proportion of graves have more than one interment. Arrangements indicating that individuals were buried at the same time are most common in Group 2 (Row graves) and Group 3 (Scattered graves) of the SE Cluster of the cemetery. No new rows were built during Phase 2. Graves with single burials are more prevalent in Group 1 (Row graves from the S and NW Clusters) than in Groups 2, 3, and 5. None of the graves in Group 5 have more than two burials and in several instances Phase 2 interments (usually one but in one case two) were added to Phase 1 graves.

Male graves form almost half of the graves in the cemetery, while Child graves are half as common and Female graves are even less common. The dominance of Male graves is most strongly expressed in Group 2 where Female graves are actually more common than Child graves. In other words, even though Group 2 graves have a substantially higher number of burials than the other MUAs, Female and Child graves are the least common. Although Child graves and burials are underrepresented overall, they are nevertheless present in relatively large numbers compared to many other Neolithic and EBA cemeteries in the region (Weber, 2020; Bronk Ramsey et al., 2021). Child graves are most common in Group 1 and many children are buried in graves with a mixed age structure, though they are rare in graves with more than three burials. The demographic category with the lowest numbers of graves and burials at Shamanka II is Adolescent(s).

In sum, of the four larger MUAs, Groups 2 and 3 share some characteristics (e.g., proportions of graves with single and multiple burials, and graves with synchronous burials) and differ in others (e.g., number of Male, Female, and Child graves). Group 1 is different from these two groups (e.g., high number of children) and Group 5 seems to be different yet (e.g., lack of spatial identity, no rows, lack of graves with more than two burials).

2. Mortuary variation at the Burial Level

Analysis of the Burial Level begins with a general presentation of the number and spatio-temporal distribution of interments at Shamanka II and then moves on to other variables of interest. Naturally, there is some overlap with the grave distribution but there are also notable differences and new insights emerge through the examination of burials.

2.1. Number and spatio-temporal distribution of burials

As mentioned in Section 1.3, the identification of distinct interments at Shamanka II is occasionally somewhat arbitrary due to extensive disturbances resulting in substantially disarticulated and incomplete skeletons and some elements apparently being moved, whether intentionally or accidentally, from grave to grave. Of the many different ways available to present the spatio-temporal distribution of burials at Shamanka II, only a few are chosen to provide background information for the rest of the analysis.

In terms of the number of interred individuals, the North Sector (i.e., the NW and SE Clusters together; n = 120) is about three times the size of the S Sector (n = 36) while the SE Cluster (n = 92) is considerably larger than the other two spatial units (Fig. 4.13; Table 4.13). Similarly, the number of burials coming from row graves is much greater than the count of individuals interred in scattered graves, a pattern particularly strongly expressed in the SE Cluster (67, 73%).

Since assignment to phase is included in the definition of the MUAs (which are analyzed later), it will suffice to mention that Phase 1 (121 or 78% of all burials) has a lot more burials than Phase 2 (21, 13%; Fig. 4.14; Table 4.14) and that Phase 2 burials are unevenly distributed between the clusters. Relative to the number of total burials in each cluster, Phase 2 burials are most common in the S Cluster (9, 25%) and least in the NW Cluster (1, 4%). Of the 21 burials assigned to Phase 2, 13 were interred in graves built during that phase (3 double-burial graves and 7 single interments) and the remaining 8 were added to graves established in Phase 1 (7 cases of 1 individual added per grave and 1 case of 2).

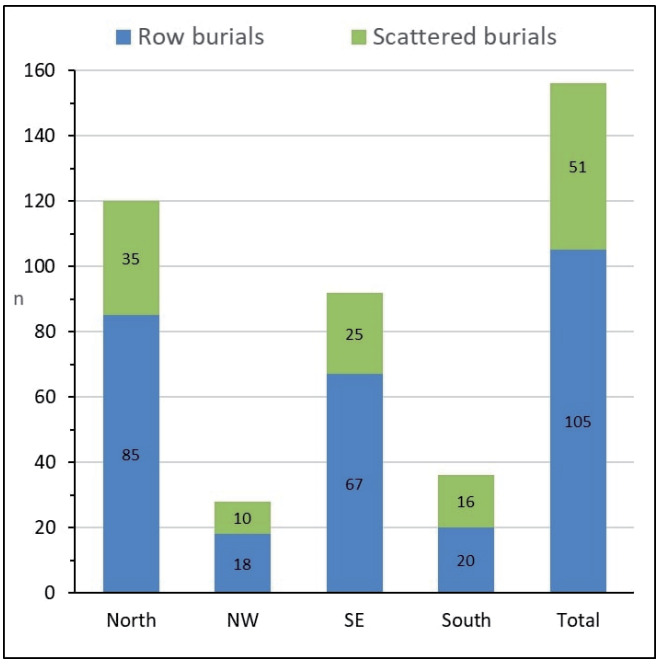


Figure 4.13. Shamanka II, Spatial distribution of burials (after Table 4.13). Figure by chapter authors

Table 4.13. Shamanka II: Spatial distribution of burials

Sector/Cluster	Row burials	Scattered burials	Row Total
North	85 (71%)	35 (29%)	120 (100%)
NW	18 (64%)	10 (36%)	28 (100%)
SE	67 (73%)	25 (27%)	92 (100%)
South	20 (56%)	16 (44%)	36 (100%)
South	20 (56%)	16 (44%)	36 (100%)
Total	105 (67%)	51 (33%)	156 (100%)

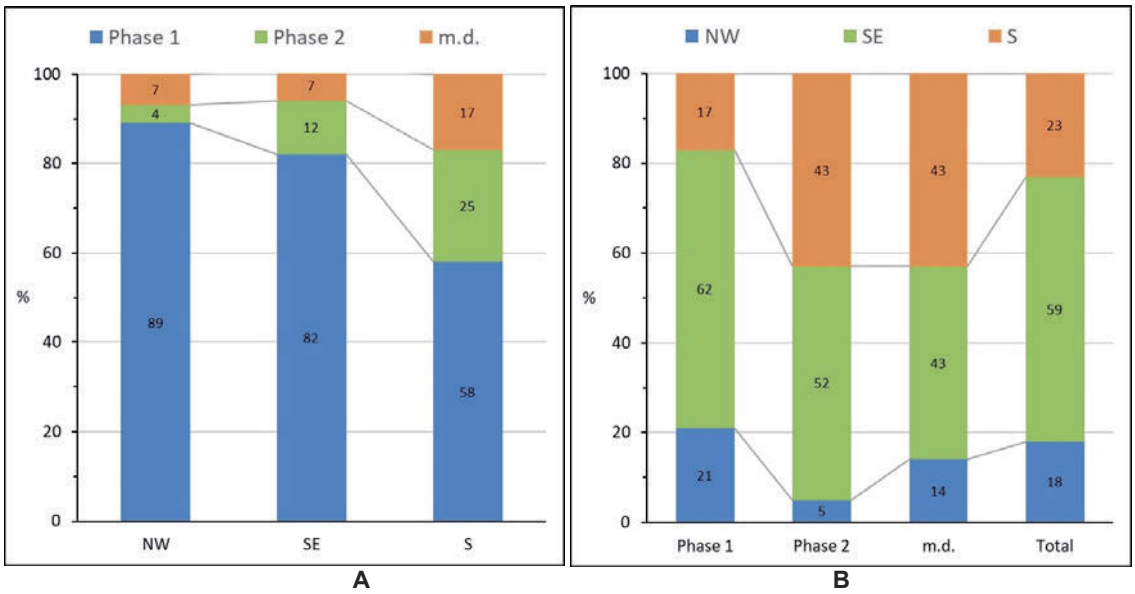


Figure 4.14. Shamanka II, Temporal distribution of burials (after Table 4.14). Figure by chapter authors:

A. By Cluster
B. By Phase

Table 4.14. Shamanka II: Temporal distribution of burials

Phase	NW			SE			S			Row Total	
	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %	n	Row %
Phase 1	25	21%	89%	75	62%	82%	21	17%	58%	121	100%
Phase 2	1	5%	4%	11	52%	12%	9	43%	25%	21	100%
m.d.	2	14%	7%	6	43%	7%	6	43%	17%	14	100%
Total	28	18%	100%	92	59%	100%	36	23%	100%	156	100%

As a reminder, MUAs are defined on the basis of spatial, chronological, and dietary criteria and are employed as the principal aspect of this analysis (c.f., Chapter 3, Section 2.3).[24] The numbers of burials assigned to each MUA are different, which is mainly the result of cluster size and the varying number of burials associated with row and scattered graves. Group 2 is the largest (52, 33% of all burials), while Group 1 (30, 19%), Group 3 (28, 18%), and Group 5 (21, 13%) are about the same size while Group 2–L (4, 3%) and Group 4 (7, 4%) are very small and thus excluded from many comparisons (Table 4.15).

Table 4.15. Shamanka II: Distribution of burials by Main Unit of Analysis

MUA	Count	Percentage
Group 1	30	19%
Group 2	52	33%
Group 2–L	4	3%
Group 3	28	18%
Group 4	7	4%
Group 5	21	13%
m.d.	14	9%
Total	156	100%

Since so many burials come from graves arranged into rows (105, 67%), their structure merits a closer look. There are 13 rows at Shamanka II (Fig. 2.1) and they range in number of graves from 3 (Rows B, I, L, and M) to 9 (Row F) and in number of burials from 4 (Rows B, L, and M) to 21 (Row F, including 1 individual interred during Phase 2 and 2 who could not be assigned to a phase). The Phase 1 burials from Rows E, F, G, and H (n = 50), a compact group from the SE Cluster, account together for 58% of all Phase 1 row burials (n = 86), 41% of all Phase 1 burials (n = 121), and almost one-third (32%) of all Shamanka II interments (n = 156). Including the three Phase 2 burials and the six that could not be assigned to a phase, these rows demonstrate the highest spatial, and likely also temporal, concentration of mortuary activities.

[24] Groups 1–4 belong to Phase 1 and Group 5 dates to Phase 2. Group 1 (NW and S Clusters) and Group 2 (SE Cluster) consist exclusively of burials from row graves, Group 3 (NW and SE Clusters) and Group 4 (S Cluster) include only burials from scattered graves, and Group 5 has both row and scattered burials.

2.2. Sex and age of burials

The matter of the sex and age structure of the Shamanka II cemetery population has been briefly presented in Chapter 3 and will be now analyzed in more detail. The general demographic structure (Table 4.16; Table 4.17) is at variance with the expected attritional demographic profile at death of a hunter-gatherer group (e.g., Duering et al., 2018; Kelly, 2013; Pennington, 2001). Most notably, Females (38, 24%) are substantially underrepresented but Children (31, 20%) are clearly underrepresented as well, although the age categories adopted for this examination are too broad to assess this matter comprehensively.

However, as signalled earlier, the distribution of this imbalance is uneven across clusters, formations, rows, and MUAs. Thus, relative to Males, Females are underrepresented by a factor of 3 in the S Cluster (5, 14% vs. 18, 50%) and by a factor of 2 in the SE Cluster (23, 25% vs. 50, 54%), but in the NW Cluster Females outnumber Males by a factor of almost 2 (10, 36% vs. 6, 21%). Next, although children (Young and Old) are underrepresented overall (20% of all burials; Table 3.4), they show the highest proportion in the NW Cluster and the lowest in the SE Cluster (10, 36% vs. 12, 13%). The proportion of Children in the S Cluster (9, 25%) is closer to the NW Cluster and also above the site average.

While there appear to be no differences in Sex and General Age structures by Formation, there do seem to be differences between specific rows. For example, there are rows with children or adults only and rows with a much higher frequency of females or males relative to the cemetery average. This matter will be examined in more detail when the demographic structure of the MUAs is discussed next.

Since presentation of MUA structure by Sex and General Age together would be somewhat cumbersome and overburdened with numbers, the analysis will be restricted to Sex Structure (Fig. 4.15; Table 4.16). This approach is justified by the fact that the Sex variable addresses also the age aspect while the General Age provides no information about sex. Adolescents are not differentiated in the Sex categories but, when practical and necessary, are mentioned separately.

Children are much above the site average (20% of all burials) in Group 1 (10, 33%), slightly above the average in Group 5 (5, 24%), and below the average in Groups 2 and 3 (12 and 18%, respectively). Females are much above the site average (24%) in Group 3 (11, 39%) and around the average in Groups 1, 2, and 5 (19–27%). Males appear to vary the least from the site average (47%): Group 1 (13, 43%) and Group 3 (11, 39%) are a little below and Group 2 (29, 56%) and Group 5 (11, 52%) are a little above. Of the 7 adolescents, 4 come from Group 3 (Fig. 4.16; Table 4.17).

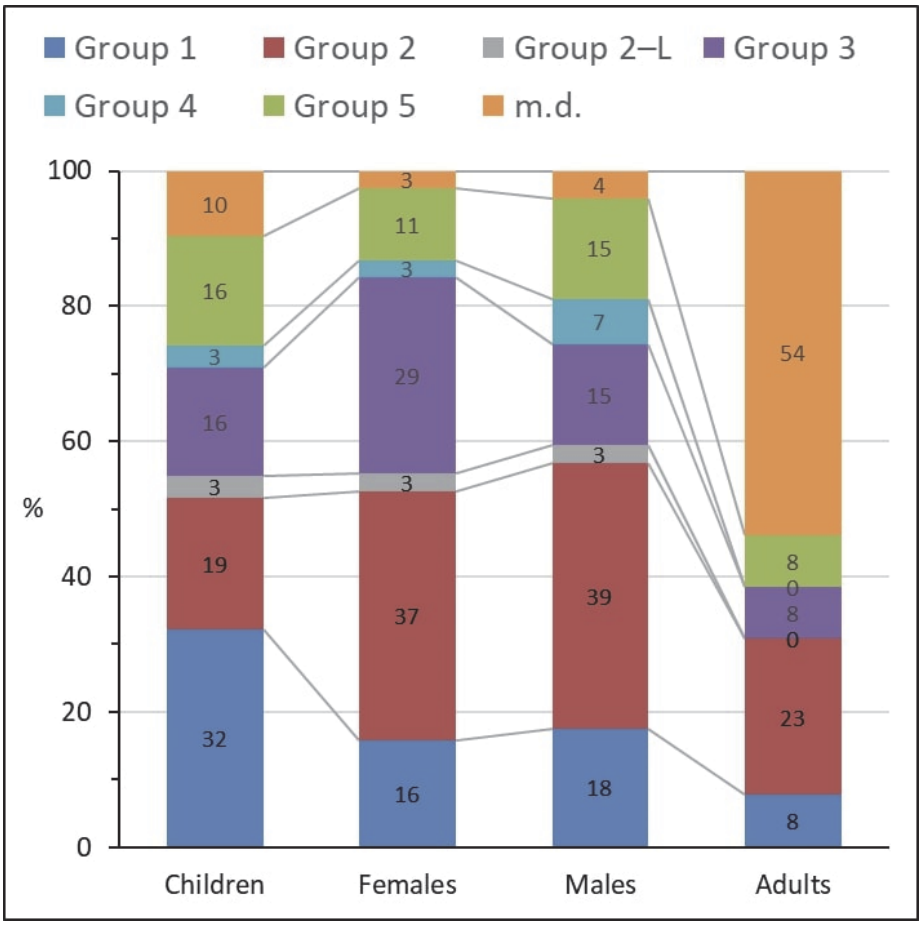
With the number of burials from a single row assigned to a given MUA as high as 18, there is enough room for variation in terms of Sex Structure by row. Many rows (e.g., Rows B, C, I, and J in Group 1, and E in Group 2) have more children than both the site and row averages and Row A (Group 1) has children only. As mentioned most adolescents come from Group 3. Females, though underrepresented at just about every level of analysis, are almost on par with Males in Row K (Group 1). Males, as expected because of their overall dominance of the cemetery population, dominate also a number of rows (e.g., Rows D, I, and J in Group 1 and G, H, and M in Group 2). Of rows with more than one child, only one contains more females than males (Row C, Group 1) while in three such rows there are males but no females in the Phase 1 graves (Rows B, I, and J in Group 1). Lastly, Row E (Group 2) stands out from the other rows by its quite balanced Sex Structure: 4 Children, 4 Females, 5 Males, and 1 Undetermined Adult.

Table 4.16. Shamanka II: Sex structure overall and by Main Unit of Analysis. Note: “0” values have been removed

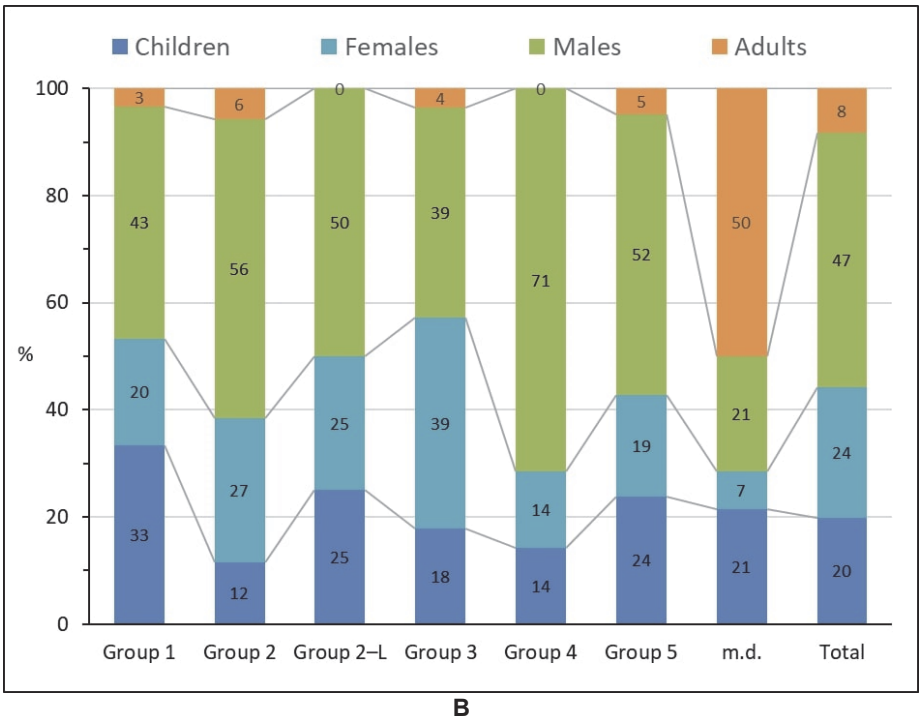
MUA	Children			Females			Males			Adults			Row Total		
	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %
Group 1	10	33%	32%	6	20%	16%	13	43%	18%	1	3%	8%	30	100%	19%
Group 2	6	12%	19%	14	27%	37%	29	56%	39%	3	6%	23%	52	100%	33%
Group 2–L	1	25%	3%	1	25%	3%	2	50%	3%				4	100%	3%
Group 3	5	18%	16%	11	39%	29%	11	39%	15%	1	4%	8%	27	100%	18%
Group 4	1	14%	3%	1	14%	3%	5	71%	7%				7	100%	4%
Group 5	5	24%	16%	4	19%	11%	11	52%	15%	1	5%	8%	21	100%	13%
Row	3	30%	10%	1	10%	3%	6	60%	8%				10	100%	6%
Scattered	2	18%	6%	3	27%	8%	5	45%	7%	1	9%	8%	11	100%	7%
m.d.	3	21%	10%	1	7%	3%	3	21%	4%	7	50%	54%	15	100%	9%
Total	31	20%	100%	38	24%	100%	74	47%	100%	13	8%	100%	156	100%	100%

Table 4.17. Shamanka II: Age structure overall and by Main Unit of Analysis. Note: “0” values have been removed

MUA	Young Child			Old Child			Adolescent			Adolescent–Adult			Adult			Row Total		
	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %	n	Row %	Col %
Group 1	8	27%	33%	2	7%	29%							20	67%	17%	30	100%	19%
Group 2	3	6%	13%	3	6%	43%	1	2%	14%				45	87%	38%	52	100%	33%
Group 2–L	1	25%	4%										3	75%	3%	4	100%	3%
Group 3	5	18%	21%				4	14%	57%				19	68%	16%	28	100%	18%
Group 4	1	14%	4%										6	86%	5%	7	100%	4%
Group 5	3	14%	13%	2	10%	29%	1	5%	14%				15	71%	13%	21	100%	13%
m.d.	3	21%	13%				1	7%	14%	1	7%	100%	9	64%	8%	14	100%	9%
Total	24	15%	100%	7	4%	100%	7	4%	100%	1	1%	100%	117	75%	100%	156	100%	100%



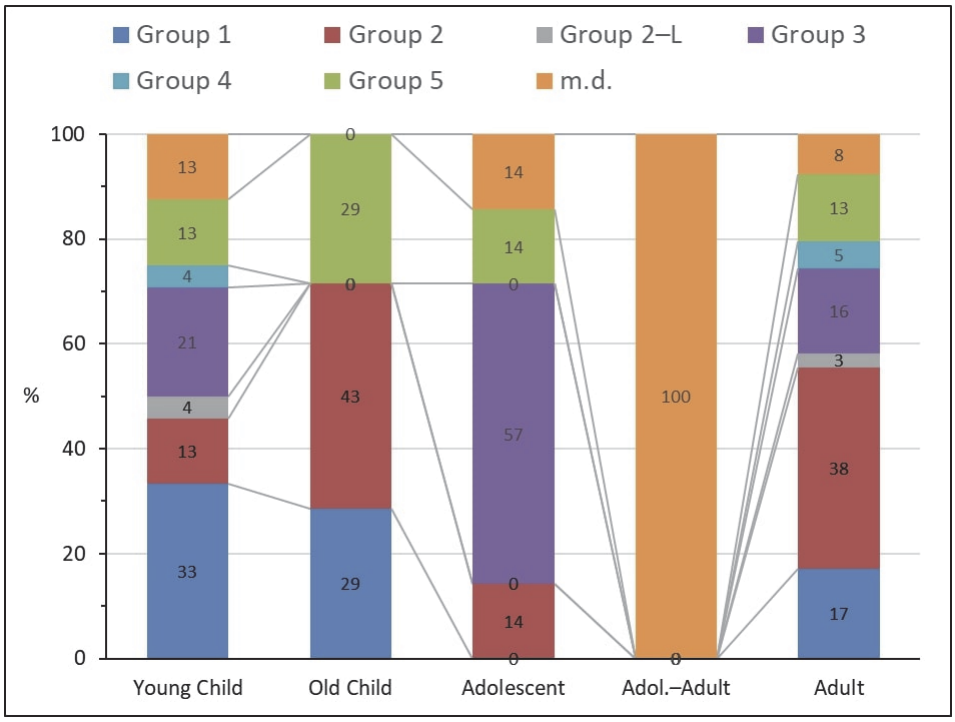
A



B

Figure 4.15. Shamanka II, Distribution of burials (after Table 4.16). Figure by chapter authors:

A. By Sex category
B. By Main Unit of Analysis



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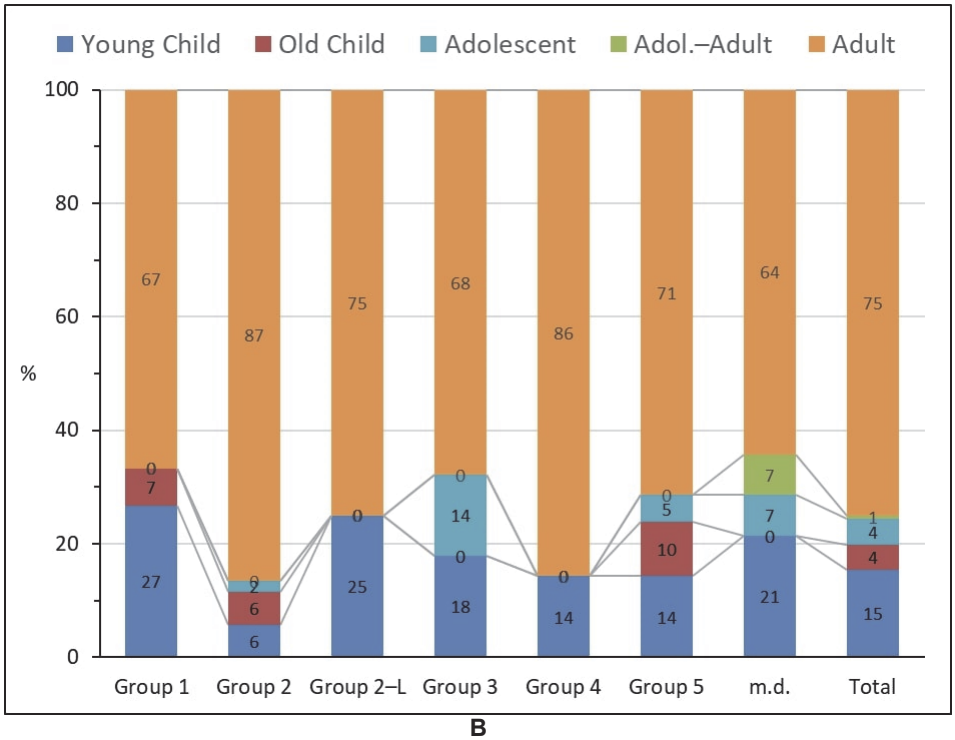


B

Figure 4.16. Shamanka II, Distribution of burials (after Table 4.17). Figure by chapter authors:

A. By Age category
B. By Main Unit of Analysis

2.3. Burial Type

The types of burial have been classified in the following manner:

- Primary: burial of the entire body immediately or soon after death (Fig. 4.4.A);
- Secondary: burial involving an archaeologically identifiable delay related to transportation of the body, exposure or display, or some other manipulation after death (Fig. 4.4.B; Fig. 4.8.A);
- Inconclusive: cases in which neither a primary nor secondary burial could be conclusively inferred; and
- Missing data: assigned to all cases in which the archaeological evidence is insufficient for assignment to either of the two main categories, usually due to the substantial incompleteness or disarticulation of the surviving skeletal remains.

Primary burials (115, 74%; 94% if the "m.d." cases are excluded) dominate the Shamanka II cemetery (Table 4.18). Of the 6 (4%) Secondary burials, 4 are Male and 2 are Female; 4 come from Group 2, 1 from Group 2–L and 1 from Group 3. The burial in Grave 15, classified as inconclusive (Fig. 5.11.A), has a displaced head and upper spine suggesting a delayed interment but the articulation of the rest of the body is consistent with a primary burial (Bazaliiskii et al., 2024). This very limited variation in Burial Type does not need more analysis.

Table 4.18. Shamanka II: Burial Type. *Excluding all "m.d." cases. Note: "0" values have been removed

Type of Burial	Count	Percentage	Percentage*
Primary	115	74%	94%
Secondary	6	4%	5%
Inconclusive	1	1%	1%
m.d.	34	22%	
Total	156	100%	100%

2.4. Body Position

Two aspects define the general Body Position: position of the legs relative to the torso (i.e., extended or flexed) and rotation around the long axis (i.e., supine, left or right side, or prone), together generating a relatively large number of potential body positions, many of which were documented at Shamanka II (Jessup et al., 2024c). To facilitate meaningful analysis, the existing variation has been reduced to the following seven categories:

- Extended/Supine (Fig. 4.4.A);
- Extended/Side (Fig. 4.17.A);
- Extended/Prone (Fig. 4.17.B);
- Extended/m.d. (Fig. 4.6);
- Contorted/Supine (Fig. 4.17.C);
- Flexed (including Side and Supine; Fig. 4.17.D);
- Pile of Bones (Fig. 4.8.A); and
- m.d.

Figure 4.17. Shamanka II, burials with different Body Positions. Figure by the BAP:

A. Burial 21.02 and Burial 21.03 in Extended/Side position
B. Burial 49 in Extended/Prone position
C. Burial 58 in Contorted/Supine position
D. Burial 93.02 in Flexed position

Overall, at Shamanka II, this aspect of mortuary practice shows little patterning between the relevant units of analysis (clusters, formations, sex, age, and MUAs) and can be summarized in the following manner (Table 4.19):

- Extended/Supine is most common (93, 60%; or 81% if the "m.d." cases are excluded) and the additional variants of the extended position (on the side, prone or m.d.) account for only an additional 7 cases (4%);
- The second most common position, although quite rare, is Flexed (10, 6%) found only in adult burials;
- All Flexed and Pile of Bones burials are adult and all of the latter are secondary practically by definition (4, 3%);
- For a relatively large number of individuals (41, 26%) body position could not be established because of grave disturbances resulting in incomplete or disarticulated skeletons;
- The Flexed body position appears to be more common in the NW Cluster (4, 14%) than in the SE Cluster (4, 4%) and S Cluster (2, 6%);
- No obvious patterns are visible relative to sex or age of the burials;
- Extended/Supine position is equally dominant across all MUAs while Flexed burials are most common in Group 1 (5, 17%) and Piles of Bones occur only in Group 2 (3, 6%) and Group 3 (1, 4%).

Table 4.19. Shamanka II: Body Position. *Excluding all "m.d." cases. Note: "0" values have been removed

Body Position	Count	Percentage	Percentage*
Extended/Supine	93	60%	81%
Extended/Side	2	1%	2%
Extended/Prone	2	1%	2%
Extended/m.d.	3	2%	3%
Contorted/Supine	1	1%	1%
Flexed	10	6%	9%
Pile of Bones	4	3%	3%
m.d.	41	26%	
Total	156	100%	100%

2.5. Head Direction

The head azimuths of burials (measured to the degree) were first assigned cardinal, ordinal or secondary intercardinal directions, which were reduced further to the following six categories: N, NE, E, SE, SW, and NW. Not Applicable is used for burials interred as Piles of Bones while Missing Data is used for incomplete and disarticulated skeletons.

This grouping process has been guided by the fact that at Shamanka II, Head Direction seems to be related primarily to the long axis of the grave pit and, secondarily, to the Horizontal Arrangement of burials in graves with more than one interment (Jessup et al., 2024a; Jessup et al., 2024c; Fig. 2.1). With rare exceptions, Shamanka II grave axes show two main orientations: NE–SW (more common) and NW–SE (much less common). In both cases the interments are placed normally with the heads in the north end of the pit (i.e., NE or NW). However, in graves with two or more interments, the Head-to-Toe arrangement occasionally results in burials placed with the head in the opposite (e.g., SW) end of the pit (Table 4.11). The less common NW–SE grave pit axis is mainly the product

of Rows K and L being oriented NE–SW, that is, perpendicular to the remaining rows which all run NW–SE.

In sum, the reduced number of Head Direction categories represents well the existing variation in the orientation of burials at the cemetery and, at the same time, sharpens analysis (Table 4.20). Head Direction shows even less patterning than Body Position but a few observations are still useful to make, though most are qualified by small sample sizes.

Table 4.20. Shamanka II: Head Direction. *Excluding all "m.d." cases. Note: "0" values have been removed

Head Direction	Count	Percentage	Percentage*
N	3	2%	2%
NE	93	60%	74%
SW	10	6%	8%
E	5	3%	4%
NW	6	4%	5%
SE	4	3%	3%
m.d.	31	20%	
n/a	4	3%	3%
Grand Total	156	100%	100%

First, the NE direction of the head is the most common (93, 60%), which is clearly related to the fact that 79 graves have pit axes oriented generally NE–SW. However, of the 10 (6%) burials with the SW head direction, 3 come from graves with single interments (2 of these are children), which means that the SW head direction is not exclusively related to the use of Head-to-Toe placement in graves with multiple burials. Moreover, half of the burials with SW head direction belong to Group 5.

Among the graves with the less common NW–SE axis, the split between a NW and SE head orientation is just about even: 6 and 4 burials, respectively.[25] Of the 4 burials with a SE head direction, 2 are from Row K (running NE–SW in S Cluster), 2 are scattered, and all are single interments. This last point means that in graves with the NW–SE axis, the head orientation functioned independently of Head-to-Toe placement, a pattern underscored further by the lack of any Head-to-Toe burials in graves with the NW–SE axis.

Lastly, since the pit axes of the scattered graves are not confined, at least intuitively, by row direction, one would perhaps expect a greater variation in pit orientation and, consequently, in head direction among these burials. This, however, is not the case. A few of the generally rare head directions (e.g., E, SW, and NW) are actually more common among row graves. Overall, there are 22 (22%) row burials and only 6 (12%) scattered burials with a head direction other than typical NE. However, the frequency of the NE head direction is about the same across both formations: 58% and 63%, respectively.

[25] One burial is oriented to the N (infant Burial 115.02) and one could not be determined (Burial 40).

2.6. Skeletal Completeness

As mentioned earlier (Section 1.3), burials at Shamanka II frequently have incomplete skeletons to the extent that some are represented only by a few elements. All 156 individuals have been assessed for completeness and scored on a scale from 1 to 100% at 10% increments (Lieverse et al., 2024). For the purpose of this analysis, this scale has been further reduced to five categories at 20% increments (1–20%, Fig. 4.18.A; 21–40%, Fig. 4.18.B; 41–60%, Fig. 4.18.C; 61–80%, Fig. 4.4.A; 81–100%, Fig. 4.18.D; Jessup et al., 2024c). Indeed, the results confirm the initial impression: only 46 (29%) burials display high skeletal completeness of 81–100% (Table 4.21).

Further examination of this material by Age shows that skeletons of Young Children are much less complete than the burials of Old Children and Adults, which is probably accounted for by natural, rather than cultural, factors. Relative to fully formed adult bones, juvenile bones have a higher organic content and thus are more susceptible to decomposition in most burial environments. Since Young Children are unevenly distributed across the cemetery, it is necessary to remove them from further analysis. Old Children, though few (7), show a distribution of Skeletal Completeness similar to that characterizing Adolescents and Adults and thus do not need to be excluded.

There also are some differences with regards to Sex. Namely, very incomplete skeletons (1–20%) appear to be more common among Females (10, 26%) than Males (8, 11%). After combining the two lowest categories (1–40%) and the two highest (61–100%), Females (11, 29% vs. 17, 45%, respectively) indeed seem to be less complete than Males (13, 18% vs. 50, 67%).

While no obvious patterns have been identified in Skeletal Completeness between row burials relative to scattered burials, there are some differences when the data are analyzed by MUAs (Fig. 4.19; Table 4.22). Skeletal Completeness appears to be lower in Group 3 than in Groups 1, 2, and 5, which show similar distributions.

Analysis of MUAs by Sex reveals more patterns. In Group 1, the proportion of very complete (61–100%) skeletons is roughly four times that of very incomplete (1–40%) skeletons for both Females and Males. In Group 2, the numbers of very incomplete and very complete Female skeletons are equal while Males are more frequently very complete. In Group 3, Female completeness is equally distributed but there are more complete than incomplete Males. In Group 4, although the sample is very small, both Females and Male skeletons are very complete. And in Group 5, highly complete Female and Male skeletons substantially prevail over the incomplete ones.

Continued examination reveals additional differences in Skeletal Completeness between rows of graves. For example, in Rows C, D (both from the NW Cluster), and J (S Cluster) — all belonging to Group 1 — the Skeletal Completeness is quite high while in Row B (NW Cluster) it is very low. The rows belonging to Group 2 appear to be a lot more balanced with the exception of Row E where all individuals for which the data could be collected score in the 60–100% range. Group 5 shows a different pattern: all individuals interred in row graves are 60–80% complete, while those interred in scattered graves have a balanced distribution.

Figure 4.18. Shamanka II, burials with different Skeletal Completeness. Figure by the BAP:

A. Burial 81 showing very low skeletal completeness
B. Burial 92 showing low skeletal completeness
C. Burial 43 showing moderate skeletal completeness
D. Burial 29 showing very high skeletal completeness

Table 4.21. Shamanka II: Skeletal Completeness. Some individuals were identified exclusively by the presence of extra skeletal elements in the grave. Due to postmortem disturbance and the lack of identifying skeletal characteristic (e.g., age, sex, pathological conditions), however, it was not always clear how many of the skeletal elements belonged to these individuals. In these cases, skeletal completeness could not be reliably determined and so the individuals were classified as "m.d."

Completeness	Count	Percentage
1–20% (very low)	31	20%
21–40% (low)	13	8%
41–60% (moderate)	15	10%
61–80% (high)	31	20%
81–100% (very high)	46	29%
m.d.*	20	13%
Total	156	100%

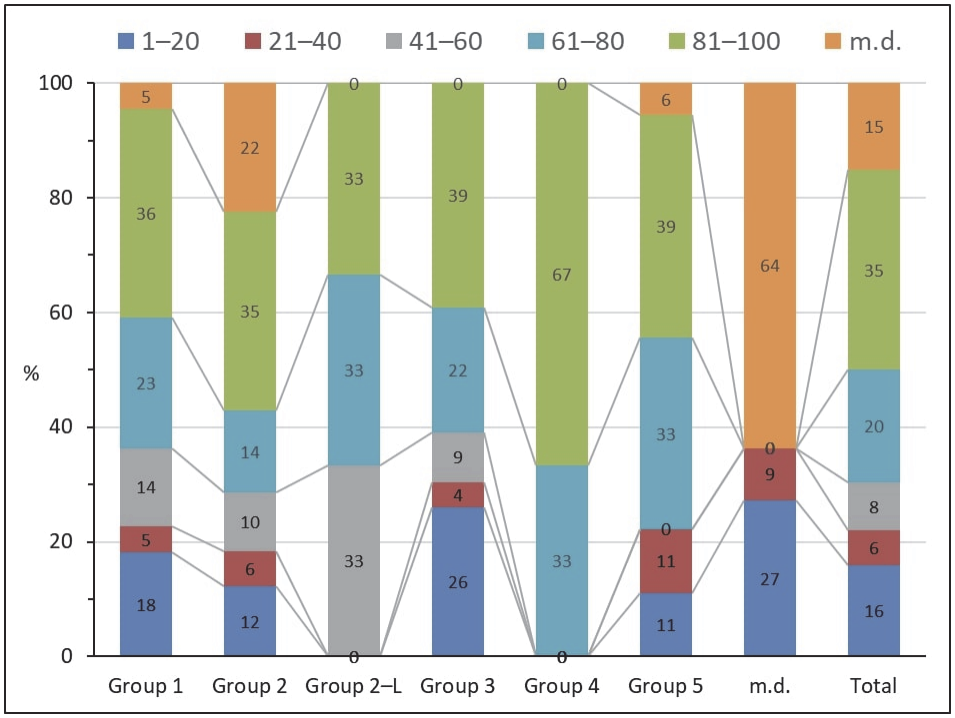


Figure 4.19. Shamanka II, Skeletal Completeness by Main Unit of Analysis (after Table 4.22). Excluding all young children. Figure by chapter authors

Table 4.22. Shamanka II: Skeletal Completeness by Main Unit of Analysis. Excluding all young children. Note: "0" values have been removed

MUA	1–20	21–40	41–60	61–80	81–100	m.d.	Row Total
Group 1	4 (18%)	1 (5%)	3 (14%)	5 (23%)	8 (36%)	1 (5%)	22 (100%)
Group 2	6 (12%)	3 (6%)	5 (10%)	7 (14%)	17 (35%)	11 (22%)	49 (100%)
Group 2–L			1 (33%)	1 (33%)	1 (33%)		3 (100%)
Group 3	6 (26%)	1 (4%)	2 (9%)	5 (22%)	9 (39%)		23 (100%)
Group 4				2 (33%)	4 (67%)		6 (100%)
Group 5	2 (11%)	2 (11%)		6 (33%)	7 (39%)	1 (6%)	18 (100%)
m.d.	3 (27%)	1 (9%)				7 (64%)	11 (100%)
Total	21 (16%)	8 (6%)	11 (8%)	26 (20%)	46 (35%)	20 (15%)	132 (100%)

2.7. Skeletal Articulation

In a manner similar to completeness, all burials were also assessed for Skeletal Articulation and scored within five categories from Fully Articulated to Fully Disarticulated (Table 4.23). Although all classes are represented by relatively large numbers, Fully Articulated skeletons (49, 31%; Fig. 4.4.A) form the largest single category. Together, Fully and Mostly (18, 12%; Fig. 4.17.C) Articulated burials account for just over 40% of the total at Shamanka II, but Mostly (33, 21%; Fig. 4.20.A) and Fully (27, 17%; Fig. 4.20.B) Disarticulated are very common too and account for almost another 40%.

Table 4.23. Shamanka II: Skeletal Articulation

Skeletal Articulation	Count	Percentage
Fully Articulated	49	31%
Mostly Articulated	18	12%
Semi-Articulated	26	17%
Mostly Disarticulated	33	21%
Fully Disarticulated	27	17%
m.d. or n/a	3	2%
Total	156	100%

At the scale of the entire dataset, there appear to be no discernible differences in articulation between the age categories but the distributions by Sex seem to be different. Females are equally frequently Fully or Mostly Articulated (16, 42%) as they are Mostly or Fully Disarticulated (15, 39%). Males are more frequently Fully or Mostly Articulated (37, 50%) than they are Mostly or Fully Disarticulated (23, 31%).

Scattered interments seem to be more frequently Fully or Mostly Articulated (27, 53%) than their row counterparts (40, 38%), though the difference is not large. Disparities between MUAs and rows, however, are more pronounced. Group 2 has a low number (18, 35%) of Fully or Mostly Articulated burials relative to Groups 1, 3, and 5, which are all in the 52–57% range. Group 5 has a low number (5, 24%) of Mostly or Fully Disarticulated burials relative to Groups 1, 2, and 3, which are all in the 36–40% range (Fig. 4.21; Table 4.24). The rows of Group 1 are quite variable. For example, Rows A and D (NW Cluster) have only Fully or Mostly Articulated burials but in Row I (S Cluster), all burials are either Mostly or Fully Disarticulated. The distribution is more even in Group 2, with most rows being quite balanced. Since Group 5 does not have its own rows of graves, it is more practical to compare the 10 burials added to the existing rows with the 11 burials interred in scattered graves. Row burials turn out to have a rather balanced distribution while 8 (73%) of the scattered ones are Fully or Mostly Articulated.

2.8. Head Treatment

This mortuary characteristic is included in the analysis because it was noted already by A.P. Okladnikov (1950) and frequently reiterated later (e.g., Bazaliiskii, 2010) that missing heads, most notably documented at the Lokomotiv cemetery, is one of the idiosyncratic aspects of the Kitoi mortuary ritual. Indeed, at Shamanka II a large number of burials are also lacking skulls. To analyze this matter further, the Head Treatment has been classified as follows:

- Present: skull present (Fig. 4.4.A);

- Absent Peri-burial: skull removed around the time of death (prior to grave back filling) as implied mainly by the absence of the first two cervical vertebrae and/or the complete and undisturbed nature of the remainder of the skeleton (Fig. 4.8.D);[26]

Figure 4.20. Shamanka II, burials with different Skeletal Articulation. Figure by the BAP:

A. Burial 71: Mostly Disarticulated
B. Burial 78.01, Burial 78.02, Burial 78.03, Burial 78.04: Fully Disarticulated

[26] At other Kitoi cemeteries, Peri-burial skull removal is sometimes indicated by the placement of skeletons so close to the grave end wall that there would not be enough room for a head to fit (e.g., Lokomotiv, Grave 26; Bazaliiskii and Savel'ev, 2008: 13). However, there are no such cases at Shamanka II.

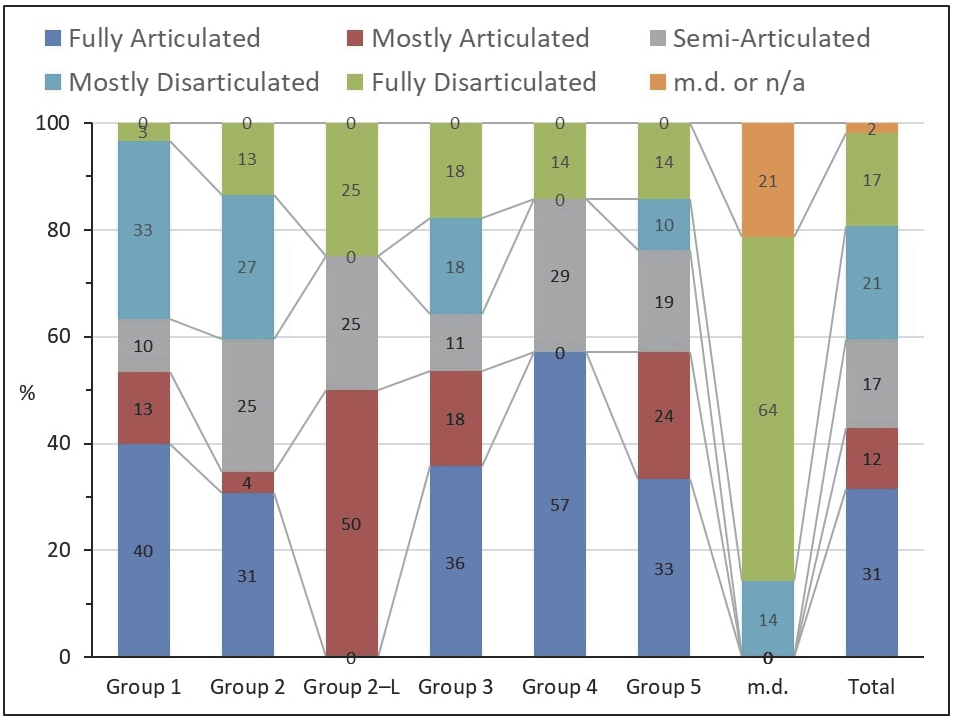


Figure 4.21. Shamanka II: Skeletal Articulation by Main Unit of Analysis (after Table 4.24). Figure by chapter authors

- Absent Post-burial: skull removed after decomposition through grave reopening and typically associated with grave and burial disturbances (Fig. 4.8.D);[27]
- Absent Undetermined: skull absent but impossible to establish whether it was removed or simply decomposed (i.e., a possibility for skeletons of young children) and, if removed, when it was removed (i.e., applicable to disturbed graves); and
- Not applicable: assigned to two cases with insufficient skeletal elements present and inconclusive evidence for post-burial grave disturbances, both described further below.

Although as many as 57 (37%) burials at Shamanka II have missing skulls, it was only possible to establish when the heads had been removed in 12 cases (3, 2% Peri-burial and 9, 6 % Post-burial; Table 4.25). Consequently, not many general or specific patterns are visible. Grouping all burials with absent skulls (i.e., Peri-burial, Post-burial, and Undetermined) shows one relatively robust pattern at the MUA level: individuals with missing skulls are more frequent in Group 1 (12, 40%) and Group 2 (21, 41%) than in Group 3 (7, 26%) or Group 5 (5, 24%; Fig. 4.22; Table 4.26). Since MUAs are partly defined on the basis of grave formation, this observation also means that row burials (Groups 1 and 2) have missing skulls more frequently than scattered burials (Group 3), a pattern consistent with the distribution of other disturbances. Lastly, all cases of identified Peri- or Post-burial skull removal belong to Adults with Males (9, 12%) perhaps more frequently affected than Females (3, 8%).

[27] The distinction between "Peri-burial" and "Post-burial" skull removal can be ambiguous.

Table 4.24. Shamanka II: Skeletal Articulation by Main Unit of Analysis. Note: "0" values have been removed

MUA	Fully Articulated	Mostly Articulated	Semi-Articulated	Mostly Disarticulated	Fully Disarticulated	m.d. or n/a	Row Total
Group 1	12 (40%)	4 (13%)	3 (10%)	10 (33%)	1 (3%)		30 (100%)
Group 2	16 (31%)	2 (4%)	13 (25%)	14 (27%)	7 (13%)		52 (100%)
Group 2–L		2 (50%)	1 (25%)		1 (25%)		4 (100%)
Group 3	10 (36%)	5 (18%)	3 (11%)	5 (18%)	5 (18%)		28 (100%)
Group 4	4 (57%)		2 (29%)		1 (14%)		7 (100%)
Group 5	7 (33%)	5 (24%)	4 (19%)	2 (10%)	3 (14%)		21 (100%)
m.d.				2 (14%)	9 (64%)	3 (21%)	14 (100%)
Total	49 (31%)	18 (12%)	26 (17%)	33 (21%)	27 (17%)	3 (2%)	156 (100%)

Table 4.25. Shamanka II: Head Treatment

Head Treatment	Count	Percentage
Present	97	62%
Absent Peri-burial	3	2%
Absent Post-burial	9	6%
Absent Undetermined	45	29%
n/a	2	1%
Total	156	100%

Table 4.26. Shamanka II: Head Treatment by Main Unit of Analysis. Note: "0" values have been removed

MUA	Present	Absent Peri-burial	Absent Post-burial	Absent Undetermined	n/a	Row Total
Group 1	18 (60%)		4 (13%)	8 (27%)		30 (100%)
Group 2	31 (60%)	2 (4%)	2 (4%)	17 (33%)		52 (100%)
Group 2–L	3 (75%)			1 (25%)		4 (100%)
Group 3	21 (75%)	1 (4%)	1 (4%)	5 (18%)		28 (100%)
Group 4	5 (71%)		1 (14%)	1 (14%)		7 (100%)
Group 5	16 (76%)		1 (5%)	4 (19%)		21 (100%)
m.d.	3 (21%)			9 (64%)	2 (14%)	14 (100%)
Total	97 (62%)	3 (2%)	9 (6%)	45 (29%)	2 (1%)	156 (100%)

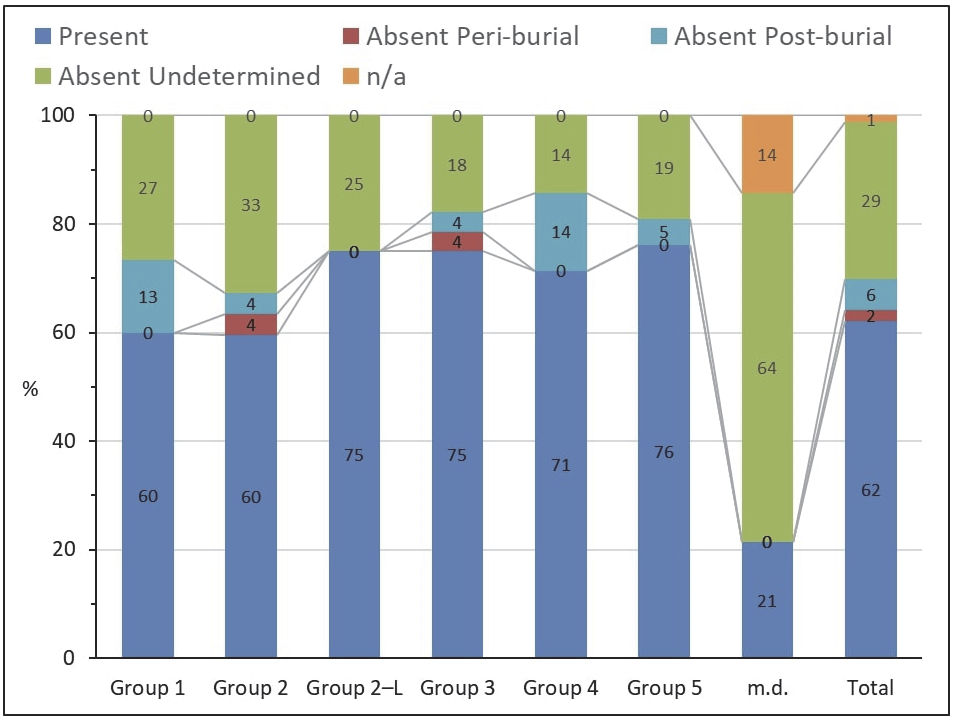


Figure 4.22. Shamanka II: Head Treatment by Main Unit of Analysis (after Table 4.26). Figure by chapter authors.

Classified as Not Applicable, Grave 36 contained only an adult cranium, mandible, and a few vertebral fragments while Grave 37 had a juvenile mandible only. Neither grave contained any grave goods and both pits were large enough to accommodate full interments (Bazaliiskii et al., 2024). It is possible that these elements represent skulls that were removed (whether Peri- or Post-burial) from other graves and re-interred separately.

2.9. Red Ochre

As mentioned, Red Ochre spread over burials is one of the most diagnostic characteristics defining Kitoi mortuary practices (e.g., Bazaliiskii, 2010; Okladnikov, 1950). Although the EN burials of Shamanka II are decisively consistent with this pattern, it is still useful to demonstrate it in quantitative terms and to search for additional patterns, if practical. The use of ochre at Shamanka II has been categorized in the following manner:[28]

- Full Coverage of the entire burial (Fig. 4.17.D);
- Skull Coverage of the head area only (Fig. 4.17.A);
- Minimal Coverage in the form of a localized stain on the postcranial skeleton or sediment somewhere at the burial level; and
- No ochre.

Unsurprisingly, a vast majority of Shamanka II burials are Fully Covered with red ochre (144, 92%) and only 8 cases (5%) lack ochre completely (Table 4.27). These 8 cases come from 4 scattered graves (including Grave 48 with 4 interments) and 1 row grave, representing all three spatial clusters. Of those assigned to an MUA, Groups 1, 3, and 4 (all from Phase 1) each have at least one burial with no ochre while Group 2 (also Phase 1)

[28] Ochre has been also documented at the upper grave pit levels (see Bazaliiskii et al., 2024 for details) but this kind of use is not analyzed here.

and Group 5 (Phase 2) have none. Lastly, the 8 individuals with no ochre include Males and Females as well as Young Children and Undetermined Adults.

Table 4.27. Shamanka II: Ochre

Ochre	Count	Percentage
Full coverage	144	92%
Skull coverage	3	2%
Minimal coverage	1	1%
No ochre	8	5%
Total	156	100%

2.10. Summary of mortuary variation at the Burial Level

Several observations regarding burial characteristics are a natural consequence of patterns documented in this chapter at the Grave Level of analysis and, while still useful to mention, are dealt with briefly. The rows of the SE Cluster (Group 2) represent the highest chronological and spatial density of mortuary activities and are dominated by male burials. Females and children, though underrepresented across the entire cemetery, are least frequent among the row graves of Group 2. Group 1 is the only unit of analysis where children, despite their rarity overall, are significantly above the site average. On the other hand, Group 3 is the only unit of analysis where females are significantly above the site average. Additionally, there are multiple rows without females or children but there is only one row without males (Row A with children only), a fresh insight from analysis at this level. Adolescent burials are even more rare than female and child interments.

Most burials are Primary inhumations and most of the small number of Secondary burials come from Group 2. Most burials are Extended Supine and the few Piles of Bones (obviously implying Secondary burials) come from Groups 2 and 3. In graves with the dominant NE–SW axis, burial orientation is less variable (most heads point NE) than in graves with a NW–SE axis (as in Rows K and L, but also in a number of scattered graves).

Burials of Group 3 are less complete than the burials of Groups 1, 2, and 5, and there are additional differences in completeness relative to sex. In Group 1, females and males are both more complete than incomplete. In Group 2, males are mostly very complete while females are mostly very incomplete. In Group 3, female completeness is equally distributed, but males are mostly complete. In Group 5, both females and males are more commonly complete. Within Group 1, some rows show a high level of completeness (e.g., C, D, and J), some very low (e.g., B). The rows of Group 2 are mostly quite balanced except for Row E where the burials are quite complete.

The articulation of female burials is equally distributed while males are more frequently articulated, with additional differences regarding MUAs and rows. Group 2 has the lowest number of Fully or Mostly Articulated burials while Group 5 has the lowest number of Mostly or Fully Disarticulated burials. Rows are quite variable in Articulation. Rows A and D (Group 1, NW Cluster) contain only Fully or Mostly Articulated burials while Row I (Group 1, S Cluster) contains only Mostly or Fully Disarticulated burials. Group 2 doesn't show this polarity with most rows being quite balanced. Row burials from Groups 1 and 2 appear to have skulls missing more frequently than the scattered burials from Group 3, a pattern consistent with the distribution of other disturbances.

Red Ochre, almost ubiquitous, provides a rare common denominator (perhaps together with the Extended Supine body position) to the mortuary characteristics summarized above.

Overall, it seems that it is the entire "package" of burial characteristics that defines the Kitoi mortuary protocol at Shamanka II, rather than a smaller set of descriptors. The exploration of mortuary variation at the EN Shamanka II cemetery continues in Chapter 5 where Grave Goods are examined.

Chapter 5. Variation in the distribution of grave goods

Andrzej W. Weber, Vladimir I. Bazaliiskii, Erin Jessup

1. Introduction

The definition of grave goods requires a few additional clarifications. Due to the presence of a cultural layer containing mostly EN materials (Bazaliiskii and Weber, 2024), many items found within the higher grave pit levels could be accidental and thus should not be considered part of the grave goods assemblage. When graves have been disturbed in the past, however, it is difficult to distinguish between accidental objects and grave goods intentionally interred (i.e., associated) with burials. This problem regards, in particular, such items as unmodified lithic flakes, blades, lithic debitage, unmodified faunal remains, pottery fragments etc., all common finds within the cultural layer at Shamanka II and many camp-sites with Neolithic strata in the region. Finished lithic, bone and antler tools and utensils, ornaments, complete ceramic vessels, and the like are rare in the cultural layer and can be confidently considered grave goods. A practical solution to this problem is presented later in this section.

Next to consider is the matter of associating grave goods with specific burials in graves with multiple interments. Even when the graves are relatively undisturbed, the association between grave goods and specific individuals is frequently unclear. Graves 14 and 17, both with two burials, provide a good example of this difficulty. While it can be reasonably justified to assign the three boar tusk pendants to Burial 14.01 and the dozen or so red deer canine pendants to Burial 14.02, in both cases found on the respective skulls, the three objects found behind their heads could easily belong to either individual (Fig. 5.1). Similarly in Grave 17, although the red deer canine pendants found on the skull of Burial 17.01 almost certainly belong to this individual, the association of most other grave goods is much less clear and essentially impossible to resolve (Fig. 5.2). The solution to this problem employed in this examination is to associate grave goods not with a burial but with a grave. This means that only in graves with a single interment can the association be securely extended to a burial within. In all graves with multiple individuals, grave inclusions are considered associated, at least potentially, with any of the individuals interred in the grave. While not ideal, this approach prevents making unjustified inferences about the association of grave goods with specific individuals and leaves this matter to be addressed in the future through a more nuanced approach.

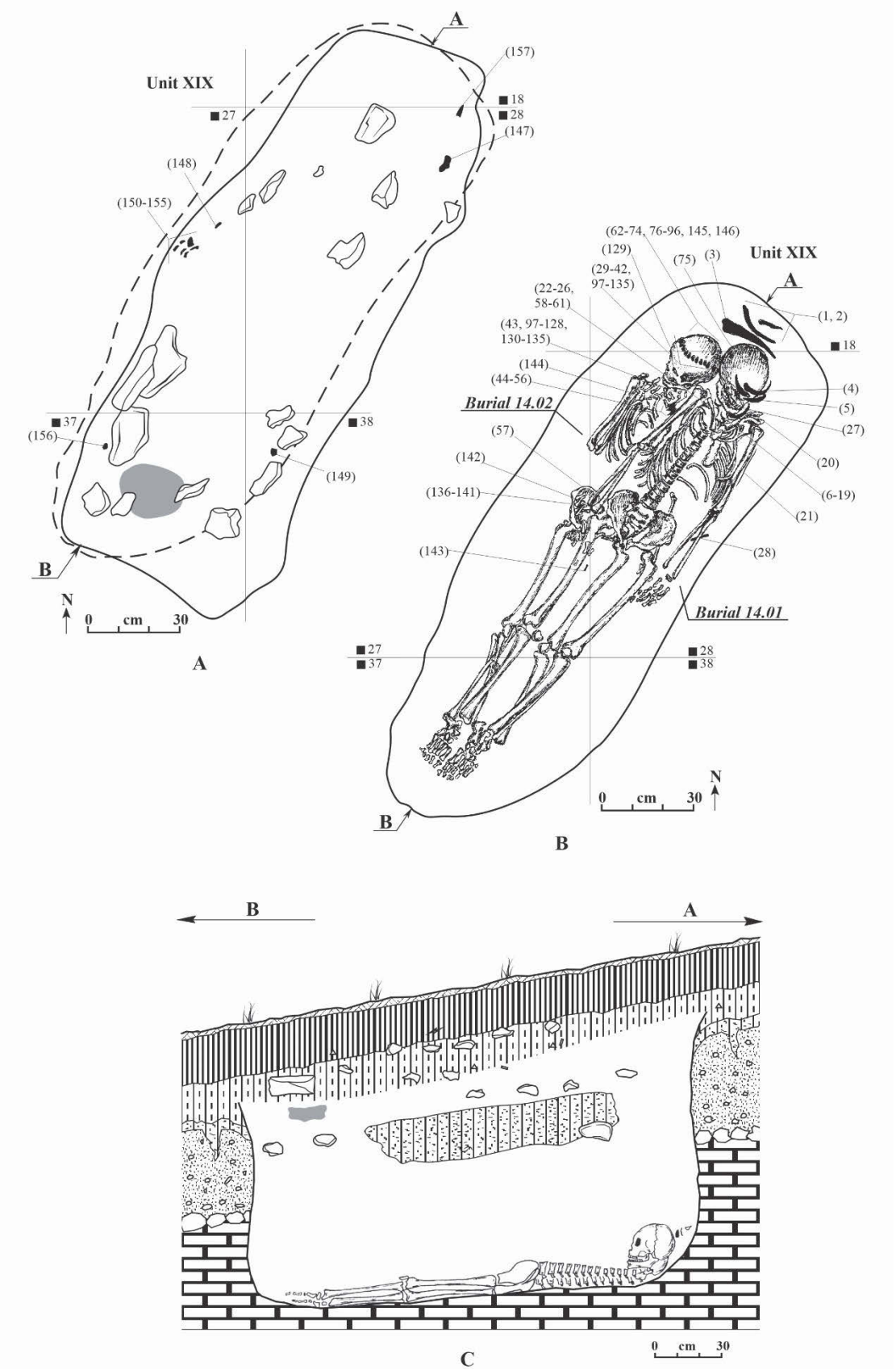


Figure 5.1. Shamanka II, Grave 14. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii:

A. Floor plan
B. Floor plan
C. Longitudinal-section

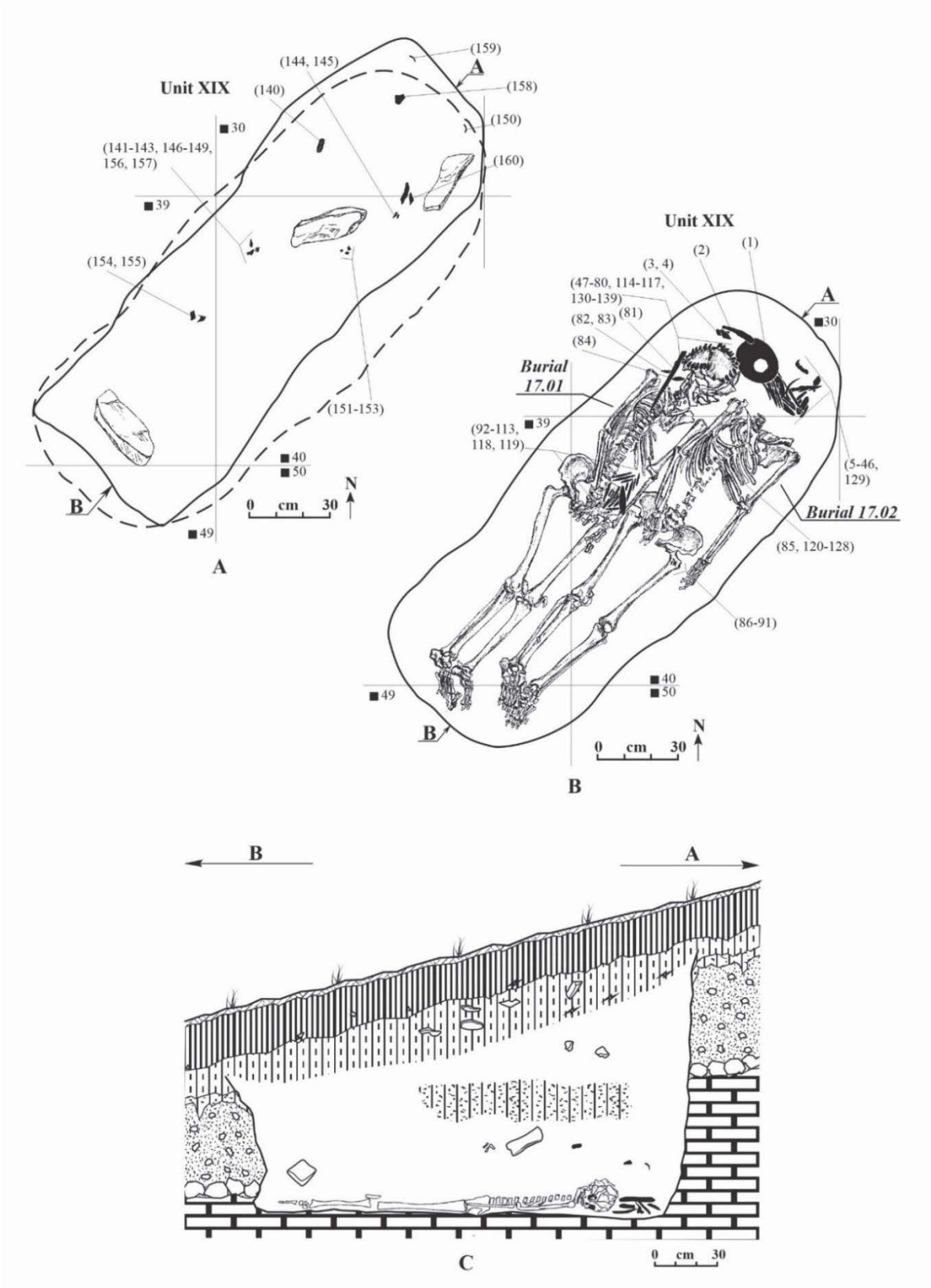


Figure 5.2. Shamanka II, Grave 17. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii:

A. Floor plan
B. Floor plan
C. Longitudinal-section

The grave goods at Shamanka II are rather diverse in kind, form, and number of objects per grave. They form quite a large assemblage, totaling ~13,000 items including artefacts and ecofacts (Jessup et al., 2024a).[29] With a sample this large, even an analysis that is only exploratory in nature (as is the goal of this overview) requires further modification and clarification of the approach described in general terms in Chapter 3.

First, each object, unless conjoining (c.f., Bazaliiskii et al., 2024 for details), is counted separately: for example, 20 red deer canine pendants, though found together and probably part of the same necklace, are counted as 20 items. This allows for later modification or grouping, as needed. Second, as mentioned, it is believed that some objects likely entered the grave accidentally from the site's cultural layer either at the time of grave backfilling or during a subsequent disturbance (i.e., reopening and backfilling again) and, therefore, should be excluded from analysis. This distinction, however, is difficult to employ for disturbed graves where these two categories of objects are commingled. In an effort to solve this problem, this analysis is limited to artefacts belonging to one of the following five main functional groups of grave goods — four utilitarian (i.e., related mainly to subsistence activities) and one of adornments:

- Bow & Arrow technology: stone or organic (bone or antler) arrowheads, bow stiffeners, and sandstone arrow straighteners (Fig. 5.11.D; Fig. 5.12.C; Fig. 5.19.D);
- Composite Tools & Weapons: organic (bone or antler) shafts for spears, daggers or knives, as well as the lithic insert blades, bifaces, spear points, and prismatic blades for them (Fig. 5.5.D; Fig. 5.12.D; Fig. 5.15.D);
- Fishing Gear: lithic composite fishhook shanks, modified talons (fishhook barbs), organic (bone or antler) harpoons, leisters, complete fishing hooks, and fish lures (lithic or organic) (Fig. 5.10.C; Fig. 5.12.B; Fig. 5.15.B; Fig. 5.16.A and C);
- Knives: organic (bone or antler) or lithic knives and saws (Fig. 5.11.B and C; Fig. 5.17.B);
- Ornaments–All, divided into:
    - Mass Ornaments often occurring in large numbers (from tens to hundreds per grave) and further split into the following three categories:
        - Red Deer Canine Pendants (Fig. 5.7.C; Fig. 5.16.D);
        - Bone Pendants (Fig. 5.7.B);[30] and
        - Other Mass Ornaments: pyrophyllite beads (Fig. 5.10.D; Fig. 5.17.D) and marmot incisors (Fig. 5.5.C); and
    - Non-mass Ornaments occurring in small numbers no greater than a few: organic and inorganic adornments such as split boar tusk pendants (Fig. 5.6.D); animal tooth or shell pendants; shell, limestone or calcite rings (Fig. 5.9.C; Fig. 5.15.C); and lithic pendants.

To be clear, these functional groups do not take into account morphological variation within bow stiffeners or arrowheads, daggers, harpoons, composite fishhook shanks or hooks, etc. Also, it is understood that some tools probably served multiple purposes and

[29] The dataset compiled in this supplement is based on the evidence presented in the detailed grave descriptions (Bazaliiskii et al., 2024), which should be consulted for any additional information.

[30] Morphologically, Bone Pendants (e.g., Fig. 5.3; Fig. 5.4.1–11, 13–14) are very similar to Red Deer Canine Pendants (e.g., Fig. 5.3; Fig. 5.4.16–21) and, based on their placement relative to burials, they appear to have been used in the same way: as head adornments, necklaces, or bracelets.

thus this process of categorization is somewhat arbitrary as is any other kind of classification. Still, despite these limitations the proposed approach responds to the necessity of reducing variation within the grave goods assemblage to manageable dimensions.[31] Thus, unless otherwise explicitly mentioned, all observations in this chapter regard these five main categories of grave goods.

Restricting analysis in this way offers a few advantages. First, since none of these artefacts are common in the cultural layer, this approach effectively excludes objects from the grave pit fill regardless of the degree of disturbance and effectively limits the analysis to grave goods intentionally interred, and thus presumably associated, with burials. Second, it excludes a number of other artefacts such as those used for the manufacture of clothes (e.g., perforators, awls, needle cases, needles, etc.) or other implements (e.g., adzes, drills, burins, scrapers, flakers, abraders etc.), as well as rare items (e.g., spoons/spatulas or zoomorphic art), all of which are deemed less useful for this overview.[32] Third, considering the large size and substantial morphological diversity of the grave goods assemblage, narrowing the analysis in this manner provides it with much needed focus. Lastly, if included in the analysis, it is quite likely that some of these items would repeat patterns displayed by the five main categories of grave goods. In other words, examination of the five main categories, which represent about 77% (~10,000 of ~13,000 objects) of the entire assemblage of graves goods, is considered sufficiently representative to reveal many fresh insights about distribution patterns across the various units of analysis.

Figure 5.3. Shamanka II, Grave 108: Red deer canine pendants (left) and bone pendants (right). Figure by chapter authors

[31] Employing a similar approach, Goriunova and colleagues recently compared EN and LN mortuary practices in the Little Sea micro-region of Cis-Baikal and identified a number of fresh similarities and differences between these two grave goods assemblages (Goriunova et al., 2020; Goriunova et al., 2021).
[32] Needle cases and zoomorphic art are examined in Chapter 6.

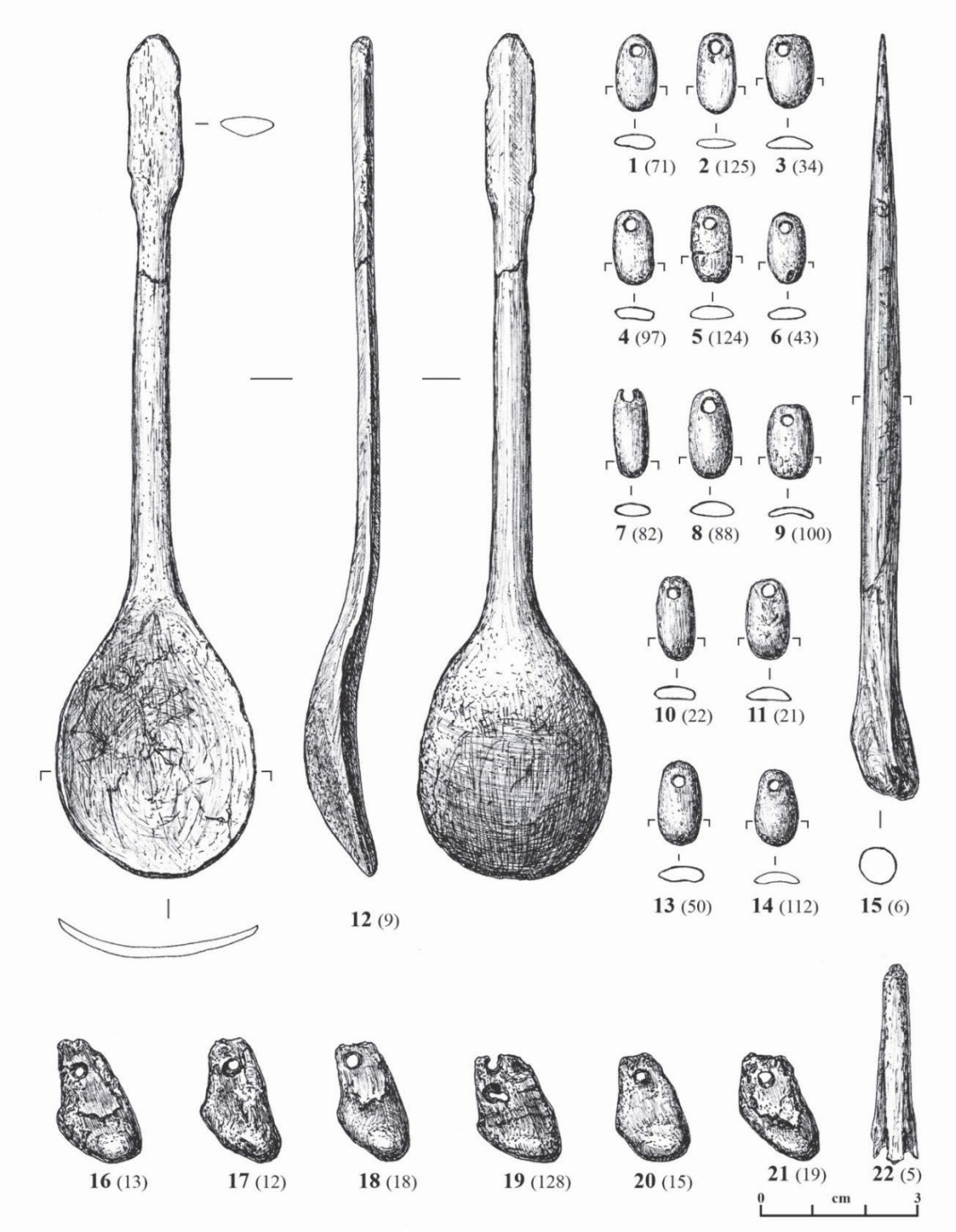


Figure 5.4. Shamanka II, Grave 28: Grave goods, including bone pendants (1–11, 13–14) and red deer canine pendants (16–21). Numbers in brackets are item numbers. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii

Expanding on the information provided in the introduction, the following analysis is based on two kinds of quantitative metrics. First, descriptive statistics have been calculated for each category of grave goods and for several of the most general units of analysis (Table 5.1). Second, Pivot Tables have been prepared in Microsoft Excel for each relevant unit of analysis and category of grave goods to provide the following information: number

of graves in the analyzed unit; number and percentage of graves with relevant objects present (i.e., prevalence data); standard deviation and sum of such objects in the group; maximum number of relevant objects recorded in one grave; number of burials in graves with such grave goods present; and, average number of relevant objects per burial in graves with such objects present in the unit. Table 5.3 is an example of these metrics generated for the five main categories of grave goods by Sex. Once again, unless otherwise explicitly mentioned, all metrics given in the text and tables regard only the five main categories of grave goods, of which only Ornaments are further split into more specific sub-categories.

2. Variation at the cemetery level

Even limited to these five main categories, the assemblage of grave goods still includes over 10,000 objects (Table 5.1). Of these, 89% (n = 8949) are ornaments and only 11% (n = 1111) belong to the four utilitarian categories with the frequency of Bow & Arrow, Composite Tools & Weapons, and Fishing objects about the same (3–4%) and Knives much less common (1%). Since the number of utilitarian objects is still quite large, the assemblage provides enough potential for variable distribution between the more specific units of analysis. Indeed, the descriptive statistics (Table 5.1) as well as the counts and percentages (Table 5.2) show substantial variation in the distribution of all five categories. A few examples illustrate this point well.

Standard deviations are quite variable (Table 5.1). Ornaments–All show a much higher variation in distribution (s.d. = 251.7) than the four utilitarian categories (s.d. = 19.8), of which Knives are the least variable (s.d. = 1.6). This high variability of adornments is driven largely by Other Mass Ornaments (s.d. = 249.6), while the other categories are closer to the values seen for the utilitarian grave goods. Bow & Arrow (n = 304), Composite Tools & Weapons (n = 340), and Fishing (n = 383) are similar in quantity, but the standard deviation for Fishing Gear (10.5) is twice as high as for the other two groups (6.5 and 5.8, respectively), though still ~20 times lower than for Other Mass Ornaments. The maxima follow the same pattern. The prevalence of Bow & Arrow, Fishing, and Knives, found in 37–40% of the graves, is about the same, while Ornaments–All (65%) are much more common and Composite Tools & Weapons (54%) are intermediate. This variation invites further examination.

3. Distribution of grave goods by Sex

The distribution of grave goods by Sex is a good place to begin this exploration (Table 5.3). Since females are greatly underrepresented in the Shamanka II cemetery population (38, 24%; Table 4.16) and even fewer graves (14, 14%; Table 4.7) contain females only, any differential distribution of grave goods between Females and Males is best visible at the level of the entire cemetery. This aspect of analysis is restricted to graves with burials of one sex only: either Female(s), Male(s) or unsexed Child(ren), further referred to simply as Female, Male, and Child graves. While excluding graves with mixed sex structure substantially lowers the sample size, it also eliminates potentially incorrect associations between grave goods and sex categories. Keep in mind that the sex categories carry also additional information about the general age of the burials (Adult vs. Child). Thus:

- Considering all grave goods (i.e., not just the five main categories), only a small number of graves have no items whatsoever: 8 (42%) Child, 0 (0%) Female, and 2 (5%) Male graves;
- Limited to the five main categories, the picture is not much different: 11 (58%) Child, 3 (21%) Female, and 4 (10%) Male graves have no such grave goods;
- Bow & Arrow items are absent from all Child graves and present in only 2 (14%) Female graves, compared to more than a half of Male graves (22, 56%);
- Fishing Gear also has quite a variable presence, occurring in 1 (5%) Child, 4 (29%) Female and 17 (44%) Male graves;
- The remaining utilitarian categories are more evenly distributed with Composite Tools & Weapons in 4 (21%) Child, 7 (50%) Female and 22 (56%) Male graves and Knives in 3 (16%) Child, 3 (21%) Female and 16 (41%) Male graves.
- Ornaments–All, while most common overall, are about twice as common in Adult graves as in Child graves: occurring in 10 (71%) Female and 24 (62%) Male graves relative to 7 (37%) Child graves.

Standard deviations, maxima, and averages per burial are even more variable, though all are higher in Male graves. Only for Knives is the standard deviation similar for all three sex categories (1.0–2.4). Otherwise, this metric is similar for Female and Child graves across grave goods categories (excluding Bow & Arrow — absent, and Fishing Gear — present in only one Child grave) and is always much lower than in Male graves. In Male graves, Fishing Gear (s.d. = 19.8) is about twice as variable as Bow & Arrow and Composite Tools & Weapons (both with s.d. = 8.7) and, of course, Ornaments–All are the most variable (s.d. = 400.0). The averages for Composite Tools & Weapons (4.0–5.8) and Knives (1.5–2.0) are about the same for all three sex groups but in both cases the maxima (39 and 9, respectively) belong to Male graves and are 2–4 times as high as in Child and Female graves. For Bow & Arrow and Fishing Gear, the averages per burial for Male graves (6.0 and 11.4) are also higher than for Female graves (1.5 and 2.8) or Child graves (0.0 and 1.5), and the maxima for Male graves are even higher: 37 Bow & Arrow and 72 Fishing for Male graves relative to 2 and 5 items for Female graves, and 0 and 3 for Child graves. Although Ornaments–All are present in large numbers in all these three sex categories, the maximum (n = 1752) in Male graves is about twice as high as in Female (998) and Child graves (899) while the averages for Male (157.5) and Child graves (144.5) are about the same and somewhat higher than for Female graves (118.7).

Adornments are sufficiently numerous and variable in kind to be examined further (Table 5.4). Red Deer Canine Pendants are relatively rare, occurring in 2 (11%) Child graves, 1 (7%) Female grave and 5 (13%) Male graves. Bone Pendants are even less common, occurring in 1 (5%) Child grave, no Female graves, and 3 (8%) Male graves. The maximum (68) and average (17.0) numbers of Red Deer Canine Pendants in Male graves are much higher than in Female (9 pendants from a single grave) and Child graves (19 and 9.3, respectively). While rare overall and absent in Female graves, Bone Pendants are quite numerous when they do occur with a maximum of 210 and average of 55.0 in Male graves and 110 pendants in the single Child grave. In fact, although present in only 4 graves, Bone Pendants show a much higher total (330), maximum (210), and average (66.0) than Red Deer Canine Pendants (173, 68, and 14.4, respectively), which were recorded in 8 graves.[33]

[33] Grave 64 contains two individuals (Male and Child) and thus the 57 Bone Pendants found in it are excluded from these calculations.

Table 5.1. Shamanka II: Descriptive statistics for five main categories of Grave Goods in various units of analysis. Note: "0" values have been removed. A – All graves together (n = 97); B – Phase 1 (Groups 1, 2, 2–L, 3 and 4; n = 72); C – Phase 2 (Group 5; n = 10); D – Group 1 (n = 23); E – Group 2 (n = 23); F – Group 2–L (n = 3); G – Group 3 (n = 18); H – Group 4 (n = 5)

A. All graves together (n = 97)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	135.3	3.1	3.5	3.9	0.9	92.3	103.7	3.1	4.0	83.7	1.4
Median	37		1			2	15			1	
S.d.	266.6	6.5	5.8	10.5	1.6	251.7	255.7	10.6	24.6	249.6	3.0
Maximum	1847	37	39	72	9	1752	1797	68	210	1745	18
Sum	13122	304	340	383	84	8949	10060	304	387	8120	138

B. Phase 1 (Groups 1, 2, 2–L, 3 and 4; n = 72)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	99.0	3.6	3.6	4.7	0.8	53.8	66.4	2.3		50.3	1.3
Median	31		0.5			2	12.5			1	
S.d.	235.5	7.2	6.4	12.0	1.6	213.5	220.8	9.0		212.5	2.5
Maximum	1847	37	39	72	9	1752	1797	44		1745	11
Sum	7127	259	259	335	56	3874	4783	162		3620	92

C. Phase 2 (Group 5; n = 10)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	381.6	2.0	2.3	1.4	0.7	352.2	358.6	3.6	38.7	309.3	0.6
Median	303.5	0.5	1.5			258.5	269.5		1.5	138.5	
S.d.	378.0	3.4	2.8	2.2	1.2	377.1	376.9	5.7	70.3	397.8	0.8
Maximum	1035	10	9	6	3	998	1001	16	210	988	2
Sum	3816	20	23	14	7	3522	3586	36	387	3093	6

D. Group 1 (n = 23)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	61.2	2.3	2.0	2.1	0.8	23.2	30.4			22.7	0.5
Median	15					1	9			1	
S.d.	93.2	6.2	3.6	5.9	1.4	72.3	72.2			72.5	1.2
Maximum	346	23	11	23	4	329	332			329	5
Sum	1407	53	46	49	18	533	699			522	11

E. Group 2 (n = 23)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	52.4	3.0	4.6	3.4	0.7	17.8	29.5	3.4		12.3	2.0
Median	36	1	1			8	21			1	
S.d.	56.9	4.2	8.7	7.9	2.0	27.4	33.4	11.3		20.2	3.4
Maximum	232	12	39	37	9	110	123	44		67	11
Sum	1206	68	106	79	17	409	679	79		283	47

F. Group 2–L (n = 3)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	776.0	12.3	13.7	6.7	1.0	655.3	689.0	2.3		652.7	0.3
Median	293	15	14	5	1	160	184			160	
S.d.	929.0	9.3	8.5	7.6	1.0	951.2	960.8	4.0		947.5	0.6
Maximum	1847	20	22	15	2	1752	1797	7		1745	1
Sum	2328	37	41	20	3	1966	2067	7		1958	1

G. Group 3 (n = 18)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments –All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	113.1	5.4	3.4	10.3	0.9	50.4	70.4	4.2		44.3	1.8
Median	57					4	25.5			0.5	1
S.d.	164.6	10.6	4.6	20.4	1.8	93.1	117.6	12.5		89.8	2.5
Maximum	641	37	13	72	7	331	449	44		329	8
Sum	2036	98	61	186	16	907	1268	76		798	33

H. Group 4 (n = 5)

Metric	*Grave Good Total*	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Categories*	*Red Deer Canine Pendants*	*Bone Pendants*	*Other Mass Ornaments*	*Non-mass Ornaments*
Mean	30.0	0.6	1.0	0.2	0.4	11.8	14.0			11.8	
Median	28						1				
S.d.	32.9	1.3	1.7	0.4	0.5	26.4	26.0			26.4	
Maximum	84	3	4	1	1	59	60			59	
Sum	150	3	5	1	2	59	70			59	

Table 5.2. Shamanka II: Abundance of five main categories of Grave Goods by Main Unit of Analysis. A – Abundance of five main categories; B – Relative abundance of five main categories within each MUA; C – Relative abundance of each main category by MUA

A. Abundance of five main categories

MUA	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Total*	*Graves*	*Burials*
Group 1	53	46	49	18	533	699	23	28
Group 2	68	106	79	17	409	679	23	40
Group 2–L	37	41	20	3	1966	2067	3	4
Group 3	98	61	186	16	907	1268	18	27
Group 4	3	5	1	2	59	70	5	5
Group 5	20	23	14	7	3522	3586	10	13
m.d. & n/a	25	58	34	21	1553	1691	15	39
Total	304	340	383	84	8949	10060	97	156

B. Relative abundance of five main categories within each MUA

MUA	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Row Total [%]*	Graves	Burials
Group 1	8%	7%	7%	3%	76%	100%	24%	18%
Group 2	10%	16%	12%	3%	60%	100%	24%	26%
Group 2–L	2%	2%	1%	0%	95%	100%	3%	3%
Group 3	8%	5%	15%	1%	72%	100%	19%	17%
Group 4	4%	7%	1%	3%	84%	100%	5%	3%
Group 5	1%	1%	0%	0%	98%	100%	10%	8%
m.d. & n/a	1%	3%	2%	1%	92%	100%	15%	25%
Total	3%	3%	4%	1%	89%	100%	100%	100%

C. Relative abundance of each main category by MUA

MUA	*Bow & Arrow*	*Composite Tools & Weapons*	*Fishing Gear*	*Knives*	*Ornaments – All*	*Five Main Column Total [%]*	Graves	Burials
Group 1	17%	14%	13%	21%	6%	7%	24%	18%
Group 2	22%	31%	21%	20%	5%	7%	24%	26%
Group 2–L	12%	12%	5%	4%	22%	21%	3%	3%
Group 3	32%	18%	49%	19%	10%	13%	19%	17%
Group 4	1%	1%	0%	2%	1%	1%	5%	3%
Group 5	7%	7%	4%	8%	39%	36%	10%	8%
m.d. & n/a	8%	17%	9%	25%	17%	17%	15%	25%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Table 5.3. Shamanka II, Phase 1: Quantitative metrics for five main categories of Grave Goods by Sex. Note: most "0" values have been removed. A – Bow & Arrow; B – Composite Tools & Weapons; C – Fishing Gear; D – Knives; E – Ornaments–All

A. Bow & Arrow

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	0						
Females	14	2	14%	3	0.7	2	2	1.5
Males	39	22	56%	155	8.7	37	26	6.0
Total	72	24	33%	158	8.5	37	28	5.6

B. Composite Tools & Weapons

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	4	21%	20	3.9	10	5	4
Females	14	7	50%	36	5.1	13	8	4.5
Males	39	22	56%	175	8.7	39	30	5.8
Total	72	33	46%	231	7.6	39	43	5.4

C. Fishing Gear

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	1	5%	3	n/a	3	2	1.5
Females	14	4	29%	11	2.1	5	4	2.75
Males	39	17	44%	263	19.8	72	23	11.4
Total	72	22	31%	277	18.1	72	29	9.6

D. Knives

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	3	16%	6	1.0	3	4	1.5
Females	14	3	21%	8	1.5	4	4	2
Males	39	16	41%	39	2.4	9	21	1.9
Total	72	22	31%	53	2.1	9	29	1.8

E. Ornaments–All

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	7	37%	1156	326.7	899	8	144.5
Females	14	10	71%	1187	310.1	998	10	118.7
Males	39	24	62%	4881	400.0	1752	31	157.5
Total	72	41	57%	7224	361.8	1752	49	147.4

Table 5.4. Shamanka II, Phase 1: Quantitative metrics for Ornaments by Sex. Note: most “0” values have been removed. A – Mass Ornaments; B – Non-mass Ornaments; C – Red Deer Canine Pendants; D – Bone Pendants; E – Other Mass Ornaments

A. Mass Ornaments

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	7	37%	1147	327.3	899	8	143.4
Females	14	8	57%	1175	344.5	997	8	146.9
Males	39	22	56%	4844	414.1	1752	25	193.8
Total	72	37	51%	7166	376.9	1752	41	174.8

B. Non-mass Ornaments

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	2	11%	9	3.5	7	2	4.5
Females	14	7	50%	12	0.8	3	7	1.7
Males	39	11	28%	37	3.4	11	18	2.1
Total	72	20	28%	58	2.8	11	27	2.1

C. Red Deer Canine Pendants

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	2	11%	28	7.1	19	3	9.3
Females	14	1	7%	9	n/a	9	1	9.0
Males	39	5	13%	136	28.1	68	8	17.0
Total	72	8	11%	173	22.8	68	12	14.4

D. Bone Pendants

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	1	5%	110	n/a	110	1	110.0
Females	14	0						
Males	39	3	8%	220	118.4	210	4	55.0
Total	72	4	6%	330	98.4	210	5	66.0

E. Other Mass Ornaments

Sex	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Children	19	6	32%	1009	350.2	880	7	144.1
Females	14	8	57%	1166	341.3	988	8	145.8
Males	39	22	56%	4488	417.1	1745	25	179.5
Total	72	36	50%	6663	381.9	1745	40	166.6

The remaining two kinds of ornaments are more common. Other Mass Ornaments are the most numerous category — present in 22 (56%) Male, 8 (57%) Female and 6 (32%) Child graves — and they essentially repeat the pattern observed for Ornaments–All: common and plentiful in graves of all three sex categories with Male graves showing the highest maximum and average. Although not abundant, Non-mass Ornaments are also more prevalent than Red Deer Canine and Bone Pendants. They are most common in Female graves (7, 50%) and least common in Child graves (2, 11%), with Male graves roughly in between (11, 28%). The maximum belongs again to a Male grave (11 vs. 3 for Female and 7 for Child graves) and the highest average is for Child graves (4.5 vs. 2.1 for Male and 1.7 for Female graves). Standard deviations for all kinds of adornments are higher for Male than for Female graves and, with one exception (Non-mass Ornaments), they are also higher than for Child graves.[34]

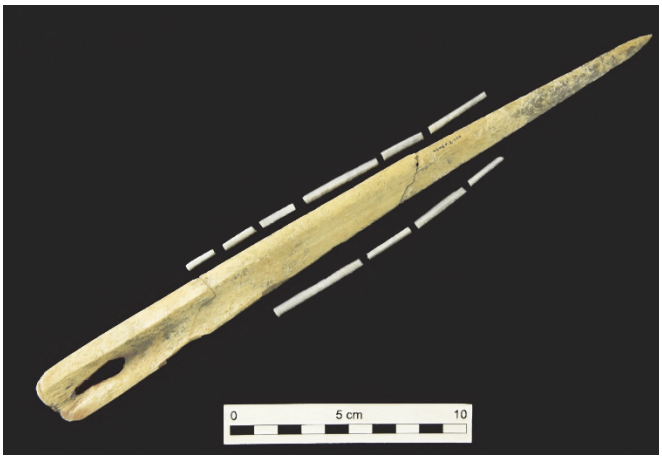
Two Female (Gr. 73 and Gr. 96) and two Child (Gr. 88 and 92) graves have grave goods assemblages which in terms of structure and numbers fit better with the mid-range of Male assemblages than with their own demographic groups. The Female graves (e.g., Fig. 5.5) have relatively large numbers of Composite Tools & Weapons, both have at least some Fishing Gear, and both have Ornaments while the Child graves (e.g., Fig. 5.6) have unusually high numbers of Composite Tools & Weapons. Additionally, the Child in Grave 28 (Fig. 5.7) was accompanied by 110 Bone Pendants. However, none of these graves come anywhere close to matching the most plentiful male assemblages, such as those from Graves 15 and 51.

[34] The standard deviations for Non-mass Ornaments in Male (3.5) and Child (3.4) graves appear to be similar, but these ornaments have been documented in only 2 child graves relative to 11 male graves.

A

B

C



D

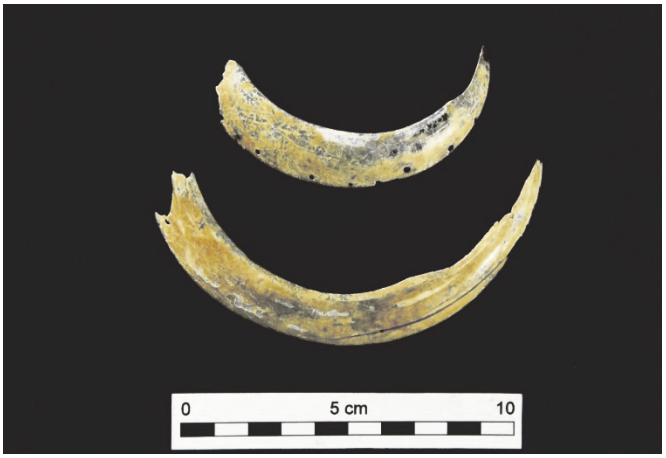
Figure 5.5. Shamanka II, Grave 73. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Harpoons
C. Marmot incisors
D. Composite tool (weapon)

A

B

C



D

Figure 5.6. Shamanka II, Grave 92. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Insert blades for Composite tool (weapon)
C. Bone shaft for Composite tool (weapon)
D. Boar tusk pendants

Figure 5.7. Shamanka II, Grave 28. Figure A by the BAP; Figures B–D by P. Kurzybov:

A. Burial level
B. Bone pendants
C. Red deer canine pendants
D. Nephrite adze

The following examples of rich and poor graves illustrate this variation well (all graves are single burials unless otherwise mentioned):

- Child graves:
  - Grave 56 (one Young and one Old Child; SE Cluster, Row G; Fig. 5.8) has 906 objects, of which 7 are utilitarian (3 Composite Tools & Weapons, 3 Fishing Gear and 1 Knife) and 899 are ornaments;
  - 11 graves have no items from the five analyzed categories (including 8 graves which have no grave goods at all);
- Female graves:
  - Grave 104 (NE periphery of the SE Cluster, scattered; Fig. 5.9) has 1001 objects, of which 3 are utilitarian (2 Bow & Arrow and 1 Composite Tools & Weapons) and 998 are ornaments;
  - 3 graves have no items from the five analyzed categories;
- Male graves:
  - Grave 112 (SE Cluster, Row L; Fig. 5.10) has 1797 items, of which 45 are utilitarian and 1752 are ornaments;
  - 4 graves have no items from the five analyzed categories (including 2 graves which have no grave goods at all);
  - Grave 15 (SE Cluster, Row H; Fig. 5.11) and Grave 51 (SE Cluster, scattered; Fig. 5.12) have the highest number of utilitarian grave goods — 95 and 118, respectively — accompanied by 8 and 331 ornaments, respectively;
  - Only 6 graves have no utilitarian objects, of which 1 has 136 ornaments and 4 have no ornaments.

Overall, the main differences between Female and Male graves are quantitative rather than in kind. The Male grave goods assemblage is dominated by Bow & Arrow (present in only 1 Female and no Child graves), Composite Tools & Weapons, Fishing, and Ornaments. The averages, standard deviations and maxima for Male graves are also much higher than in Female and Child graves, indicating substantial variation within Male graves. On the other hand, Female and Child assemblages show many similarities; Composite Tools & Weapons and Knives are relatively common in Female and Child graves.

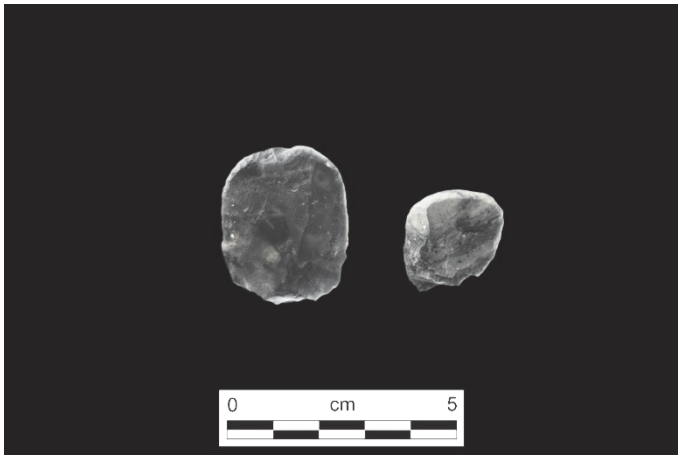
Figure 5.8. Shamanka II, Grave 56. Figures A, B by the BAP; C, D by P. Kurzybov:

A. Burial level of 56.01
B. Burial level of 56.02
C. Carbonate-amphibole slate abrader
D. Antler spoon

A

B

C



D

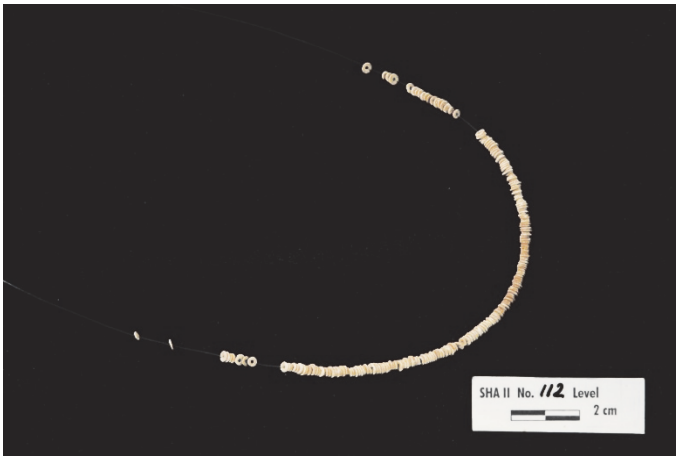
Figure 5.9. Shamanka II, Grave 104. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Antler spoon
C. Fragment of white marble ring
D. Chert scrapers

A

B

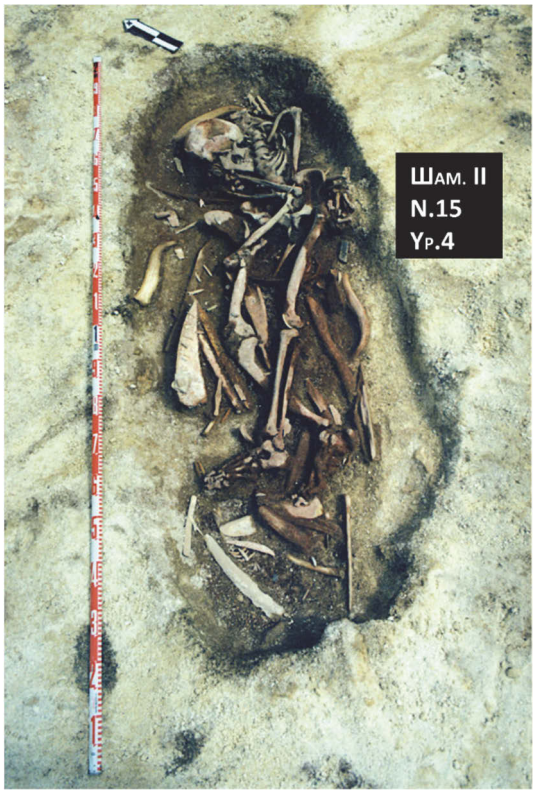
C



D

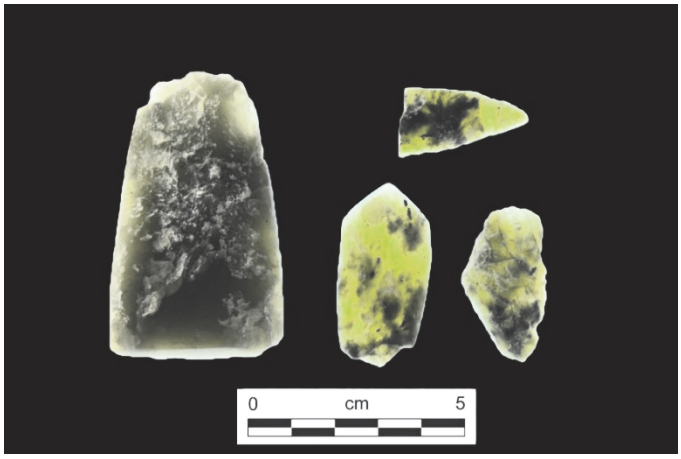
Figure 5.10. Shamanka II, Grave 112. Figures A, D by the BAP; B, C by P. Kurzybov:

A. Burial level
B. Polished grey micro-quartzite adze
C. Harpoons
D. Pyrophyllite beads

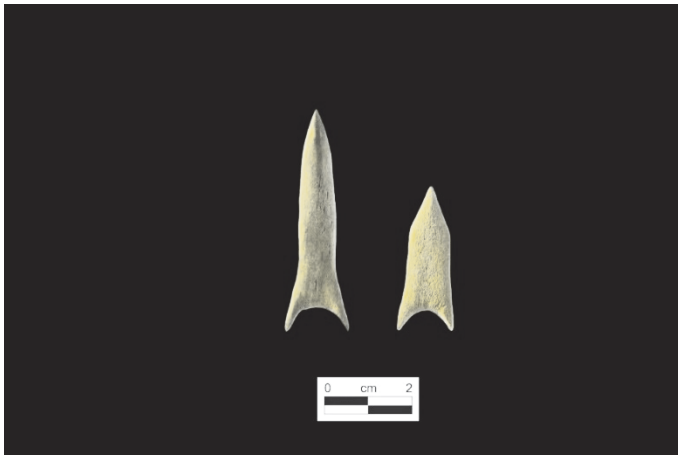


A

B



C



D

Figure 5.11. Shamanka II, Grave 15. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Knife made of siliceous argillite
C. Nephrite adze (left) and knives
D. Antler arrowheads

A

B

C

D

Figure 5.12. Shamanka II, Grave 51. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Composite fishhook shanks
C. Stone arrowheads
D. Composite tool (weapon)

4. Distribution of grave goods by phase

Radiocarbon dating demonstrated two intervals of use at Shamanka II and, to date, it remains the only Kitoi cemetery in the region displaying this temporal pattern (Chapter 2; Bronk Ramsey et al., 2021; Weber et al., 2016a). Sample sizes, however, for the two intervals are quite different: Phase 1 has 72 graves and Phase 2, which is much shorter in duration, has 10 only, while 15 graves are excluded from analysis because they have burials from both phases or their phase assignment could not be established (Graves 36, 37, 98, and 99; Fig. 3.2). Since very few Phase 2 graves have individuals of the same sex (2 Child, 2 Female, and 4 Male graves), comparison between the phases by sex is not practical and limiting assessment to Male graves would result in an even more imbalanced sample size: 31 in Phase 1 relative to 4 in Phase 2. Consequently, in the comparison between the two phases the presence and absence data are perhaps more meaningful than the quantitative metrics (Fig. 5.13; Table 5.5).

Table 5.5. Shamanka II: Quantitative metrics for five main categories of Grave Goods by Phase.
A – Bow & Arrow; B – Composite Tools & Weapons; C – Fishing Gear; D – Knives; E – Ornaments–All

A. Bow & Arrow

Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	30	42%	259	9.1	37	51	5.1
Phase 2	10	5	50%	20	3.9	10	7	2.9
Total	82	35	43%	279	8.7	37	58	4.8

B. Composite Tools & Weapons

Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	36	50%	259	7.5	39	62	4.2
Phase 2	10	7	70%	23	2.8	9	10	2.3
Total	82	43	52%	282	7.1	39	72	3.9

C. Fishing Gear

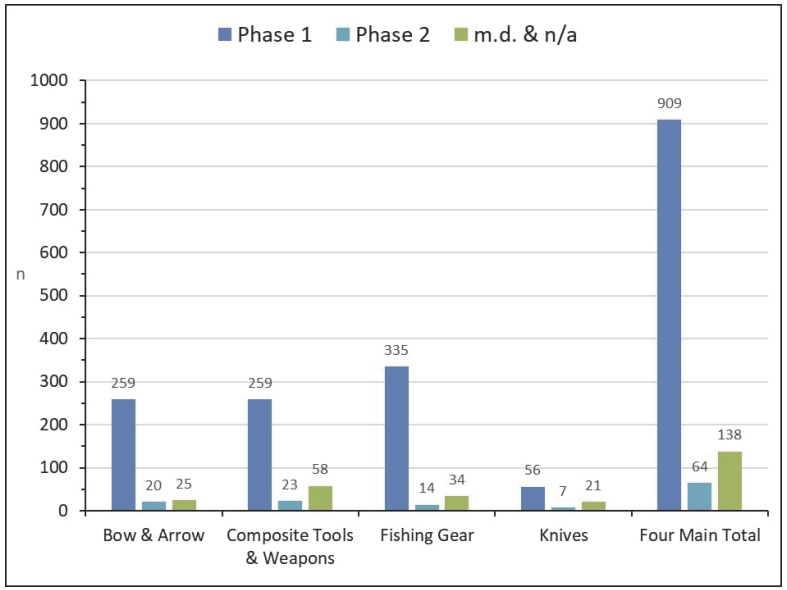
Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	26	36%	335	17.2	72	44	7.6
Phase 2	10	4	40%	14	2.1	6	7	2.0
Total	82	30	37%	349	16.4	72	51	6.8

D. Knives

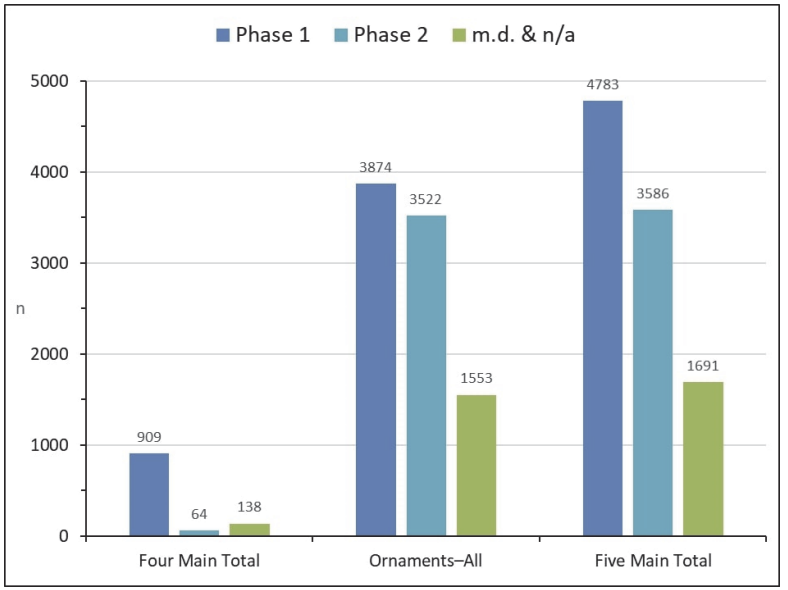
Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	22	31%	56	2.1	9	33	1.7
Phase 2	10	3	30%	7	0.6	3	5	1.4
Total	82	25	30%	63	2.0	9	38	1.7

E. Ornaments–All

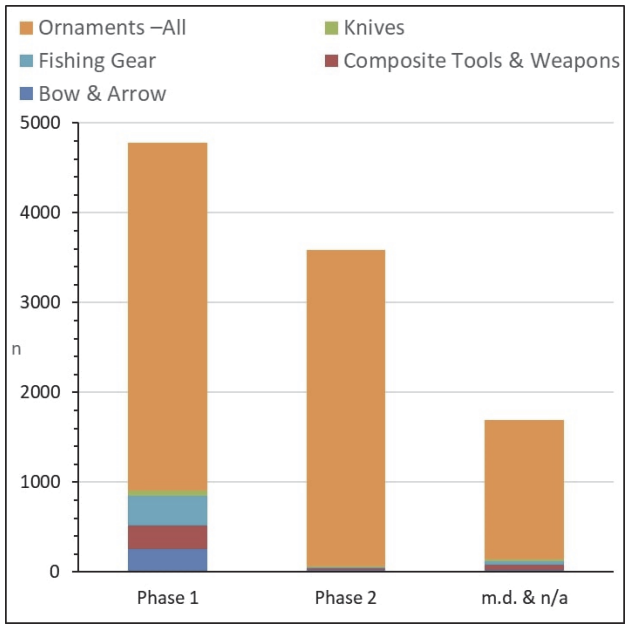
Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	46	64%	3874	263.3	1752	73	53.1
Phase 2	10	8	80%	3522	372.2	998	11	320.2
Total	82	54	66%	7396	305.7	1752	84	88.0



A



B



C

Figure 5.13. Shamanka II, Abundance of grave good categories by Phase (after Table 5.5). Figure by chapter authors:

A. Four main utilitarian categories
B. Four main total, Ornaments–All and Five main total
C. Five main categories

Bow & Arrow (42% vs. 50%), Fishing Gear (36% vs. 40%), and Knives (31% vs. 30%) are about equally present in graves from Phase 1 and Phase 2, while Composite Tools & Weapons (50% vs. 70%) and Ornaments–All (64% vs. 80%) appear to be more common in Phase 2. The maxima of the five grave goods categories are much higher in Phase 1, by a factor ranging from 2 for Ornaments–All to 12 for Fishing Gear. However, averages and standard deviations show a different picture. The average number of Knives per burial (1.7 vs. 1.4) is equally low in both phases, while Bow & Arrow (5.1 vs. 2.9), Composite Tools & Weapons (4.2 vs. 2.3), and Fishing Gear (7.6 vs. 2.0) are more numerous in Phase 1, and Ornaments–All (53.1 vs. 320.2) are 6 times more plentiful in Phase 2. Ornaments–All is the only category with a higher standard deviation in Phase 2 (372.2) than in Phase 1 (263.3), while Bow & Arrow, Composite Tools & Weapons, Fishing Gear, and Knives show much higher variation in Phase 1.

As before, it is useful to assess the structure of ornaments in more detail (Fig. 5.14; Table 5.6). The 10 graves assigned to Phase 2 have almost as many Mass Ornaments as all 72 Phase 1 graves combined. The average per burial is about 5 times higher (351.6 vs. 66.4) in Phase 2 and the distribution is more variable (s.d. = 353.5 vs. 284.4). The maximum number (1752) of Mass Ornaments from a single grave, however, belongs to Phase 1 (Gr. 112; single Male) and is considerably higher than the maximum (997) from Phase 2 (Gr. 104; single Female). Red Deer Canine pendants have been found in only 8% (6) of Phase 1 graves compared to 40% (4) of graves from Phase 2, but the maximum, average, and standard deviation are all higher for Phase 1 (44, 14.7, and 18.6 vs. 16, 6.0, and 5.7, respectively). Bone Pendants are known only from Phase 2 graves (5, 50%) and the maximum (210), average (55.3), and standard deviation (86.0) are all much higher than the same metrics for Phase 1 Red Deer Canine Pendants. Other Mass Ornaments (i.e., pyrophyllite beads and marmot incisors) replicate the pattern described for all Mass Ornaments. Lastly, although Non-mass Ornaments seem to be equally common in graves of both phases (27, 38% for Phase 1 and 4, 40% for Phase 2), their maximum, average, and standard deviation are all higher for Phase 1 (11, 1.8, and 3.0 vs. 2, 1.0, and 0.6).

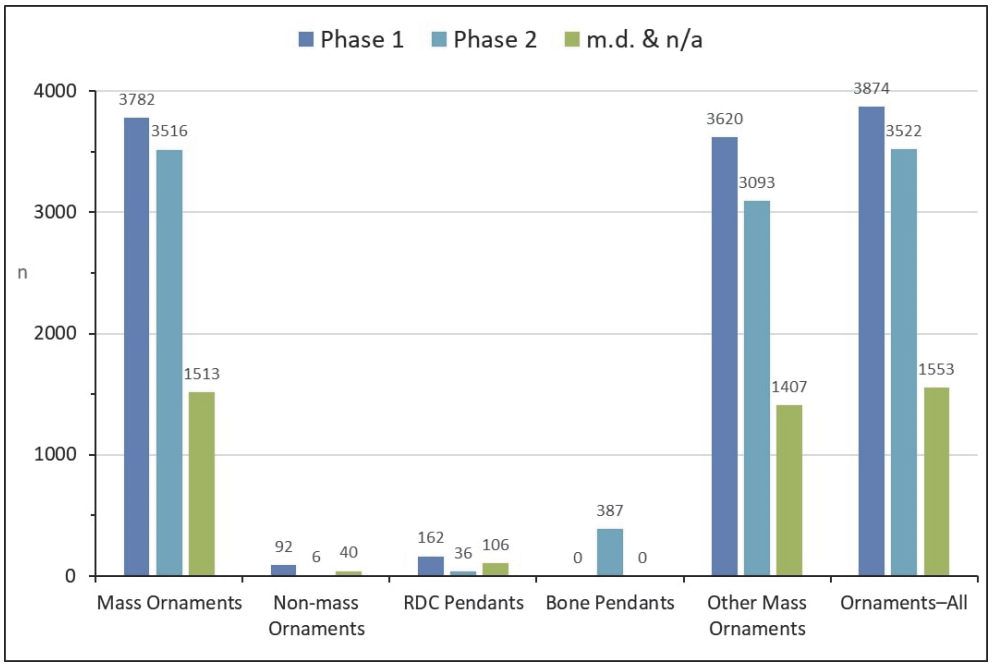


Figure 5.14. Shamanka II, Abundance of Ornaments by Phase (after Table 5.6). Figure by chapter authors

Table 5.6. Shamanka II: Quantitative metrics for Ornaments by Phase. Note: most "0" values have been removed. A – Mass Ornaments; B – Non-mass Ornaments; C – Red Deer Canine Pendants; D – Bone Pendants; E – Other Mass Ornaments

A. Mass Ornaments

Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	39	54%	3782	284.4	1752	57	66.4
Phase 2	10	7	70%	3516	353.5	997	10	351.6
Total	82	46	56%	7298	326.5	1752	67	108.9

B. Non-mass Ornaments

Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	27	38%	92	3.0	11	51	1.8
Phase 2	10	4	40%	6	0.6	2	6	1.0
Total	82	31	38%	98	2.9	11	57	1.7

C. Red Deer Canine Pendants

Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	6	8%	162	18.6	44	11	14.7
Phase 2	10	4	40%	36	5.7	16	6	6.0
Total	82	10	12%	198	17.0	44	17	11.6

D. Bone Pendants

Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	0						
Phase 2	10	5	50%	387	86.0	210	7	55.3
Total	82	5	6%	387	86.0	210	7	55.3

E. Other Mass Ornaments

Phase	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Phase 1	72	38	53%	3620	286.8	1745	54	67.0
Phase 2	10	6	60%	3093	396.5	988	9	343.7
Total	82	44	54%	6713	332.2	1745	63	106.6

In sum, while Bone Pendants is the only category of grave goods distinguishing Phase 1 (absent) from Phase 2 (present) in qualitative terms, there are also a few quantitative differences. Utilitarian grave goods are more numerous and variable in distribution among the graves of Phase 1 while ornaments, obviously excluding Bone Pendants, are more numerous and variable in Phase 2.

5. Distribution of grave goods in Male graves in Groups 1, 2, and 3

As a reminder, spatial and dietary criteria (Chapter 2; Weber et al., 2016a; Weber et al., 2021), helped identify four groups of burials within Phase 1:

- Group 1: row burials from the NW and S Clusters which show no dietary trend;
- Group 2: row burials from the SE Cluster which show a trend towards the increased consumption of local Kultuk Bay fishes and, perhaps, some Baikal seal;
- Group 3: scattered burials from the SE and NW Clusters which show a trend towards the increased consumption of local Kultuk Bay fishes but of different species structure than Group 2 and, perhaps, Group 4 too; and
- Group 4: scattered burials from the S Cluster which show a trend towards the increased consumption of local Kultuk Bay fishes and, perhaps, some Baikal seal.

Since the numbers of graves in Group 1 (n = 23), Group 2 (23), and Group 3 (18; Table 3.2) are roughly similar and the numbers of burials are sufficiently high (30, 52, and 28, respectively; Table 3.3), a comparison of grave goods assemblages between them seems feasible. However, results of such an analysis would not be very meaningful because of the very different sex structures of these units (Table 4.16):

- Group 1 has 10 (33%) children, 6 (20%) females, and 13 (43%) males;
- Group 2 has 6 (12%) children, 14 (27%) females, and 29 (56%) males; and
- Group 3 has 5 (18%) children, 11 (39%) females, and 11 (39%) males.

Limiting comparison to graves with only one sex represented retains this imbalance: Child graves are a lot more common in Group 1 (8, 35%) than in Group 2 (1, 4%) and Group 3 (4, 22%), Female graves are equally prevalent in Group 1 (5, 22%) and Group 3 (4, 22%) and much less common in Group 2 (2, 9%), and Male graves are almost twice as prevalent in Group 2 (12, 52%) as in Group 1 (7, 30%) and Group 3 (6, 33%; Table 4.8).

Thus, comparison between these three units, whether including all graves or focusing on graves with burials of the same sex only, would be affected by the marked differences in the numbers of Child, Female, and Male graves. For the same reason, comparison by Sex is also impractical. At this time, the only feasible approach seems to be restricting the analysis to Male graves, which provides the largest sample size, with the stipulation that results are somewhat qualified by the imbalance in numbers between groups. It is likewise important to note that the Male graves in Group 1 come from rows in two different spatial units of the cemetery: the NW Cluster of the North Sector and the S Cluster (i.e., S Sector), and that Row K has a different orientation from the rest. Therefore, the Male graves of Group 1 may be more diverse in terms of cultural identity than those of Group 2 (row graves of the SE Cluster) and Group 3 (scattered graves of the NW and SE Clusters, both of the N Sector).

Bow & Arrow objects are present in 100% of Male graves from Group 3 but only roughly half of Male graves from Group 1 (43%) and Group 2 (50%; Table 5.7). The averages per burial are about the same between groups (7.0–8.3) but the other metrics vary. Groups 1 and 3 show maxima (23 and 37, respectively) and standard deviations (12.7 and 13.9) much higher than Group 2 (12 and 3.9). All three maxima come from graves with single interments: Grave 46 in Group 1 (23 items), Grave 18 in Group 2 (12 items), and Grave 51 in Group 3 (37 items). The remaining graves in each group have far fewer Bow & Arrow objects: 2 graves with 1 item each in Group 1, 1–10 items in 5 graves from Group 2, and 1–8 objects in 5 graves from Group 3.

Table 5.7. Shamanka II: Quantitative metrics for five main categories of Grave Goods for Males in Groups 1, 2 & 3. A – Bow & Arrow; B – Composite Tools & Weapons; C – Fishing Gear; D – Knives; E – Ornaments–All

A. Bow & Arrow

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	3	43%	25	12.7	23	3	8.3
Group 2	12	6	50%	42	3.9	12	6	7.0
Group 3	6	6	100%	56	13.9	37	8	7.0
Total	25	15	60%	123	9.9	37	17	7.2

B. Composite Tools & Weapons

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	1	14%	1	n/a	1	1	1.0
Group 2	12	8	67%	81	12.2	39	10	8.1
Group 3	6	4	67%	34	3.4	13	6	5.7
Total	25	13	52%	116	9.8	39	17	6.8

C. Fishing Gear

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	2	29%	8	4.2	7	2	1.1
Group 2	12	7	58%	73	12.1	37	9	2.0
Group 3	6	3	50%	149	20.7	72	5	2.1
Total	25	12	48%	230	22.4	72	16	3.2

D. Knives

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	3	43%	4	0.6	2	3	1.3
Group 2	12	4	33%	16	3.6	9	4	4.0
Group 3	6	3	50%	10	3.2	7	5	2.0
Total	25	10	40%	30	2.8	9	12	2.5

E. Ornaments–All

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	5	71%	483	141.7	329	5	96.6
Group 2	12	9	75%	179	23.2	69	11	16.3
Group 3	6	2	33%	383	197.3	331	3	127.7
Total	25	16	64%	1045	109.2	331	19	55.0

Composite Tools & Weapons are rare in Group 1 Male graves (1, 14%) but are much more common in Groups 2 and 3, with a frequency of 67% in both (8 and 4 graves, respectively; Table 5.7). By far the highest number of these grave goods was found in Group 2 (Gr. 15 with 39 objects), with the remaining 7 graves in the 1–12 range. The maximum in Group 3 is 13 (Gr. 17) with the other 3 graves in the 5–9 range. Both Graves 15 and 51 are single interments while Grave 17 is a double burial. The average and standard deviation are higher in Group 2 (8.1 and 12.2) than in Group 3 (5.7 and 3.4), but this is mainly due to the large number of Composite Tools & Weapons recovered from Grave 15.

Fishing Gear is also rare in Group 1 where it is present in only 2 (29%) Male graves, with a maximum of 7 (Gr. 75), average of 1.1, and standard deviation of 4.2: indices that

are all qualified, however, by the low number of Fishing Gear items found overall (8 only; Table 5.7). These metrics are much higher in Groups 2 and 3 where Fishing Gear was collected from 7 (58%) and 3 (50%) graves, respectively. The maxima are 37 items (Gr. 15) for Group 2 and 72 (Gr. 51) for Group 3. All three maxima associate with single burial graves. The ranges for the remaining graves are: 1–10 in Group 2 and 1–46 in Group 3 while the other grave in Group 1 had 1 object only. The standard deviation for Group 2 is much lower than for Group 3 (12.1 vs. 20.7) but the averages are similar (2.0 and 2.1).

The category of Knives is the least numerous with only 30 objects documented in all three groups together, but coming from 10 graves (40%) they are the most evenly distributed of all five categories of grave goods: 3 graves (43%) in Group 1, 4 (33%) in Group 2 and 3 (50%) in Group 3. The maxima are 2, 9 and 7, the averages 1.3, 4.0 and 2.0, and the standard deviations 0.6, 3.6 and 3.2 for Groups 1, 2 and 3, respectively (Table 5.7). The highest number comes again from Grave 15 (Group 2), while the second highest is from Grave 53 (Group 3) with two males.

Ornaments display yet a different distribution (Table 5.8). Non-mass Ornaments (by definition present in small numbers) are absent from the Male graves of Group 1 but quite common in Group 2 (6, 50%) and less so in Group 3 (2, 33%). The maximum of 11 comes from Group 2 (Gr. 22 with a single Male) and, consequently, the average (3.6) and standard deviation (4.2) are higher than for Group 3 (1.0 and 0.7, respectively). Of the Mass Ornaments, Red Deer Canine Pendants are generally quite rare: absent in Group 1 and present only in 1 grave each from Group 2 (8%; 1 pendant in Gr. 22) and Group 3 (17%; 44 pendants in Gr. 17 with two burials). Grave 17 shows the highest number of Red Deer Canine Pendants of any graves assigned to a phase.[35] Other Mass Ornaments are the most common category of adornments, present in 5 (71%) graves from Group 1, 8 (67%) from Group 2, and 2 (33%) from Group 3. In Groups 1 and 3 they occur either in large or very small numbers and the maxima for both groups are the same — 329 items. The average and standard deviation for Group 1 are 96.6 and 141.7, compared to 112.0 and 227.7 for Group 3. The range for the remaining 4 graves in Group 1 is 1–136, while the remaining grave from Group 3 has 7 items. In Group 2, Other Mass Ornaments are distributed more equitably among the 8 graves: the maximum is 67, the average is 18.6, and the standard deviation is 24.2.

Table 5.8. Shamanka II: Quantitative metrics for Ornaments for Males in Groups 1, 2 & 3 (Bone Pendants are absent from Phase 1). Note: most "0" values have been removed. A – Mass Ornaments; B – Non-mass Ornaments; C – Red Deer Canine Pendants; D – Other Mass Ornaments

A. Mass Ornaments

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	5	71%	483	141.7	329	5	96.6
Group 2	12	8	67%	150	24.2	67	8	18.8
Group 3	6	2	33%	380	196.6	329	3	126.7
Total	25	15	60%	1013	112.2	329	16	63.3

[35] The highest number (n = 68) of Red Deer Canine Pendants for the entire cemetery comes from Grave 52 (Group 2, Row F) with 2 males, of which Burial 52.01 belongs to Phase 1 while Burial 52.02 could not be assigned chronologically and thus the grave is excluded from this analysis (Jessup et al., 2024a). Moreover, the grave was disturbed and the association of a number of grave goods with either individual remains unclear (Bazaliiskii et al., 2024).

B. Non-mass Ornaments

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	0						
Group 2	12	6	50%	29	4.2	11	8	3.6
Group 3	6	2	33%	3	0.7	2	3	1.0
Total	25	8	32%	32	3.9	11	11	2.9

C. Red Deer Canine Pendants

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	0						
Group 2	12	1	8%	1	n/a	1	1	1.0
Group 3	6	1	17%	44	n/a	44	1	44.0
Total	25	2	8%	45	30.4	44	2	22.5

D. Other Mass Ornaments

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	7	5	71%	483	141.7	329	5	96.6
Group 2	12	8	67%	149	24.2	67	8	18.6
Group 3	6	2	33%	336	227.7	329	3	112.0
Total	25	15	60%	968	113.3	329	16	60.5

The fact that the analysis has been narrowed to Male graves, coupled with the low prevalence and small quantities of some grave goods (e.g., Knives, Red Deer Canine Pendants, and Non-mass Ornaments) necessitates caution in assessing the results. It is advisable to pay more attention to general patterns than details as some differences can be spurious. Excluding Knives from consideration because of their low numbers, the following general patterns come to the fore:

- Group 1 Male graves completely lack two categories of adornments (Non-mass Ornaments and Red Deer Canine Pendants), have the lowest metrics for Composite Tools & Weapons and Fishing Gear, have very uneven quantities of Bow & Arrow and Other Mass Ornaments, and exhibit the maximum for only one category (Other Mass Ornaments), which is shared with a grave from Group 3;[36]
- Group 2 Male graves show the most balanced distribution across all categories of grave goods despite the fact that two maxima — for Composite Tools & Weapons and Non-mass Ornaments — belong to this unit;[37]
- Group 3 Male graves show uneven quantities of Bow & Arrow, Fishing Gear, Other Mass Ornaments, and Red Deer Canine Pendants, and exhibit four category maxima: Bow & Arrow, Fishing Gear, Red Deer Canine Pendants, and Other Mass Ornaments (shared with a grave from Group 1);
- Almost all maxima belong to graves with single burials:
  - Bow & Arrow: 37 items in Grave 51 (Group 3), which contains a total of 449 objects including 331 ornaments;
  - Composite Tools & Weapons: 39 items in Grave 15 (Group 2), which contains a total of 103 objects including only 8 ornaments;

[36] The site maximum (n =1745) belongs to Grave 112 from Group 2–L which is excluded from this comparison.
[37] Although excluded from this list, Group 2 also has the site maximum for Knives (Gr. 15, n = 9).

- Fishing Gear: 72 items also in Grave 51 (Group 3);
- Non-mass Ornaments: 11 items in Grave 22 (Group 2; Fig. 5.15), which contains a total of 55 objects including 25 ornaments;
- Red Deer Canine Pendants: 44 items in Grave 17 with 2 burials (Group 3; Fig. 5.2; Fig. 5.16), which contains a total of 98 objects including 52 ornaments;
- Other Mass Ornaments: 329 items in both Grave 34 (Group 1; Fig. 5.17), which contains a total of 332 objects, and Grave 51 (Group 3), which contains a total of 449 objects;

- In the above tally, Grave 51 (Group 3) has three maxima (for Bow & Arrow, Fishing gear and Other Mass Ornaments) while Grave 15 (Group 2) has one (for Composite Tools & Weapons; and also for Knives, which are excluded from this list);
- Overall, Group 1 and Group 3 Male graves show a differential distribution of most categories while Group 2 displays a substantially more balanced allocation.

6. Distribution of grave goods in Group 2

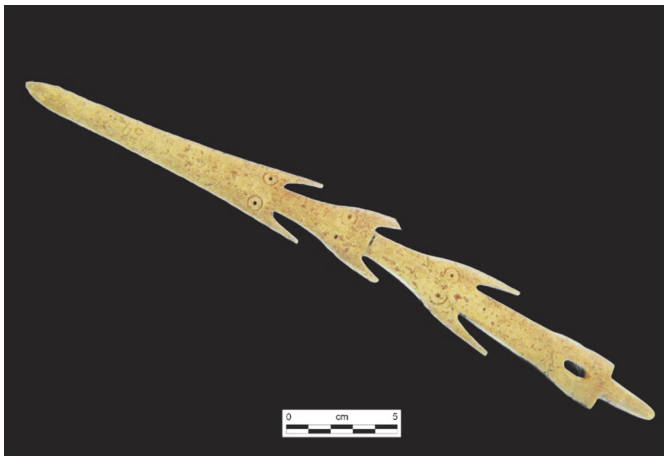
Group 2 (burials from row graves in the SE Cluster of the cemetery) is the only unit of analysis with enough spatial structure to be analyzed further: its 23 graves and 52 interments (Table 3.2; Table 3.3) are arranged into 5 rows (E, F, G, H, and M) running parallel one to another in the NW–SE direction (Fig. 2.1). Since rows comprise at least three graves by definition, it is not clear whether Row M should be included in the analysis because its third grave (Gr. 108) was constructed only during Phase 2. Consequently, though included in the prepared tables, Row M is rarely mentioned. Since Group 2 has only 15 graves with single sex structure of the interments (Table 4.8), this analysis is more practical when all 23 graves are included.

Most grave goods categories show a relatively even distribution with at least two graves per row having objects from a given category (Table 5.9). Exceptions to this pattern involve Knives, which are known from two graves in Row H but only one grave in each of Rows E, F, and G, and Red Deer Canine Pendants, which show a similar but perhaps a more elaborate pattern. Consequently, to present the latter distribution properly, it is necessary to refer to all rows of graves at Shamanka II, that is, not only those belonging to Group 2.

Of the 13 rows, only 7 (Rows E, F, G, H, I, L, and M) contain such pendants, in 6 of which they have be found in only 1 grave per row, and Row F is the only one where they occur in more than 1 grave: Grave 22 belongs to Group 2 and Graves 25 and 52 both have burials from Phase 1 and interments that could not be assigned to a phase, therefore not assigned to a specific MUA. Row M has three graves with a mixed chronological structure in that two graves belong to Phase 1 (Gr. 71 and 85) and one to Phase 2 (Gr. 108), of which only Grave 108 contained both Red Deer Canine Pendants and Bone Pendants, the only adult grave at Shamanka II with both kinds of such pendants present (Gr. 28 also has both but it is a child burial). Thus, excluding Row L (Group 2–L), Group 2 is the only spatial unit with rows of graves, where all rows have at least one grave with Red Deer Canine Pendants, although in the case of Row M this pattern finalized only during Phase 2. Interestingly, the burial of a male in Grave 15 (Row H) with a rich and diverse assemblage of utilitarian objects (n = 95), contains few ornaments (n = 8), none of which are Red Deer Canine Pendants.[38]

[38] In Grave 51 from Group 3 (scattered graves of the N Sector), a single burial of a Male interred with an equally rich assemblage of utilitarian grave goods and a much higher number of ornaments (n = 331), Red Deer Canine Pendants are again absent.

A



B

C

D

Figure 5.15. Shamanka II, Grave 22. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Antler harpoon
C. Freshwater mussel shell rings
D. Composite tool (weapon)

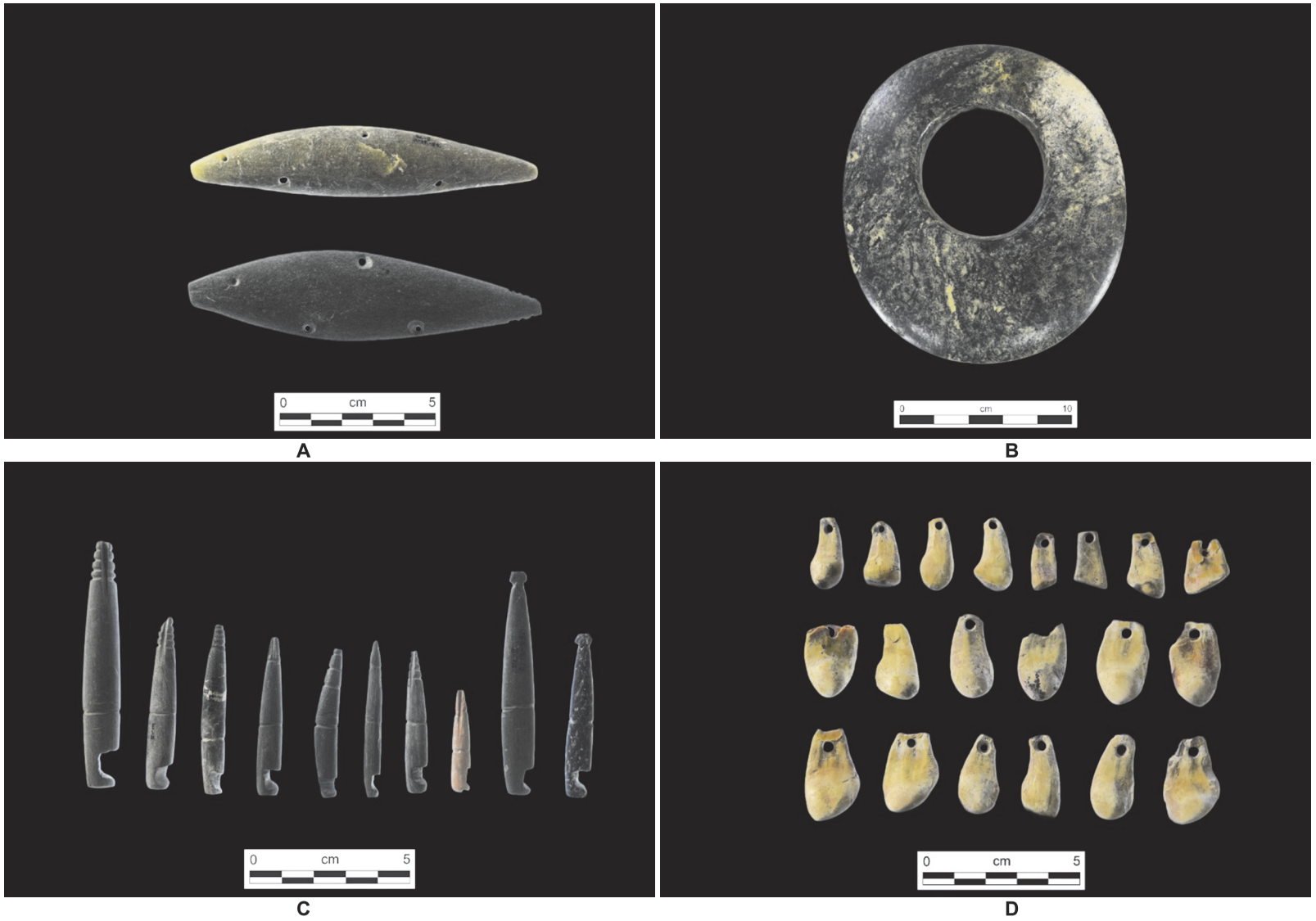


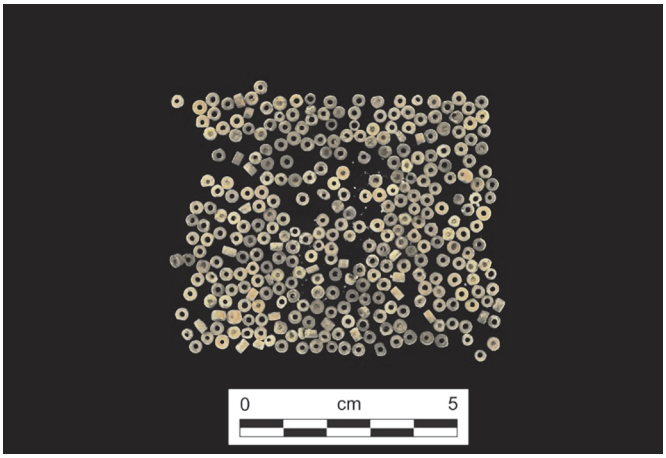
Figure 5.16. Shamanka II, Grave 17. Figure by P. Kurzybov:

A. Fish lures
B. Perforated disc-shaped implement made of apodiabase amphibole-clinozoisite epidote rock
C. Composite fishhook shanks
D. Red deer canine pendants

A

B

C



D

Figure 5.17. Shamanka II, Grave 34. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Knife-shaped implements made of roe deer scapula
C. Antler spoon
D. Pyrophyllite beads

Lastly, although there are only 2 Female and 1 Child graves in Group 2, it is still useful to compare them to the Male graves detailed in Section 5. Grave 54 (single Female) has only 1 Fishing item, 2 Non-mass Ornaments, and 31 Other Mass Ornaments, while Grave 57 (double Female) has no grave goods from the five categories analyzed here. Grave 67 — the only Child grave in this group — has no objects whatsoever.

7. Row L

Row L (Gr. 112, 115, and 116), not included in Group 2 due to its NE–SW orientation but nonetheless part of the SE Cluster, is somewhat unique in this regard. Bow & Arrow and Composite Tools & Weapons are present in all 3 (100%) graves, Fishing Gear and Knives are present in 2, and Other Mass Ornaments (beads and marmot incisors), also present in all 3 graves, show the highest concentration within the entire cemetery (n = 1958). Grave 115 (Fig. 5.18), a double burial of a Female and a Child, contains 32 utilitarian objects and 54 ornaments, a rich grave goods assemblage for either demographic at Shamanka II. However, the remaining two Male graves are even richer and one (Gr. 116; Fig. 5.19) included two complete composite bows.

Table 5.9. Shamanka II: Quantitative metrics for five main categories of Grave Goods and Red Deer Canine Pendants by Row. Note: most "0" values have been removed. A – Bow & Arrow; B – Composite Tools & Weapons; C – Fishing Gear; D – Knives; E – Ornaments–All; F – Red Deer Canine Pendants

A. Bow & Arrow

Row	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 2	23	12	52%	68	4.3	12	24	2.8
E	5	3	60%	5	1.2	3	11	0.5
F	6	2	33%	7	3.5	6	3	2.3
G	5	2	40%	13	7.8	12	2	6.5
H	5	4	80%	38	1.9	12	7	5.4
M	2	1	50%	5	n/a	5	1	5.0
Group 2–L	3	3	100%	37	9.3	20	4	9.3
Row K	4	1	25%	23	n/a	23	1	23.0

B. Composite Tools & Weapons

Row	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 2	23	13	57%	106	10.4	39	25	4.2
E	5	4	80%	20	7.3	16	13	1.5
F	6	2	33%	18	4.2	12	4	4.5
G	5	2	40%	11	6.4	10	2	5.5
H	5	3	60%	50	19.3	39	4	12.5
M	2	2	100%	7	0.7	4	2	3.5
Group 2–L	3	3	100%	41	8.5	22	4	10.3
Row K	4	1	25%	1	n/a	1	1	1.0

C. Fishing Gear

Row	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 2	23	11	48%	79	10.4	37	20	4.0
E	5	1	20%	1	n/a	1	5	0.2
F	6	4	67%	14	3.0	7	7	2.0
G	5	2	40%	19	0.7	10	2	9.5
H	5	4	80%	45	17.2	37	6	7.5
M	2	0						
Group 2–L	3	2	67%	20	7.1	15	3	6.7
Row K	4	0						

D. Knives

Row	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 2	23	5	22%	17	3.4	9	7	2.4
E	5	1	20%	1	n/a	1	3	0.3
F	6	1	17%	4	n/a	4	1	4.0
G	5	1	20%	1	n/a	1	1	1.0
H	5	2	40%	11	4.9	9	2	5.5
M	2	0						
Group 2–L	3	2	67%	3	0.7	2	3	1.0
Row K	4	1	25%	1	n/a	1	2	0.5

E. Ornaments–All

Row	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 2	23	16	70%	409	29.8	110	29	14.1
E	5	3	60%	61	20.6	44	11	5.5
F	6	6	100%	102	12.4	33	10	10.2
G	5	1	20%	1	n/a	1	1	1.0
H	5	4	80%	130	51.8	110	5	26.0
M	2	2	100%	115	16.3	69	2	57.5
Group 2–L	3	3	100%	1966	951.2	1752	4	491.5
Row K	4	1	25%	2	n/a	2	1	2.0

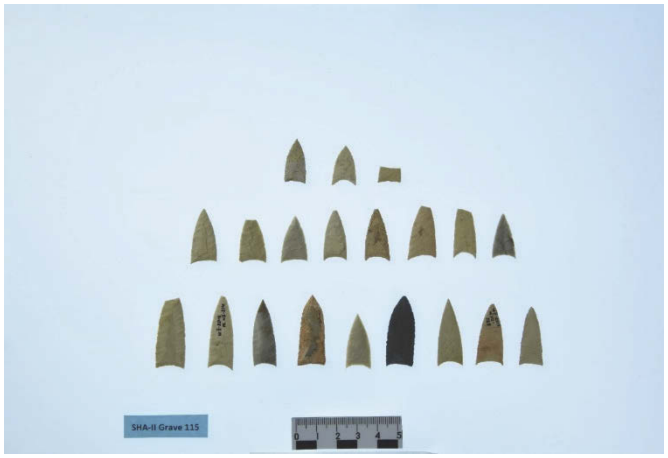
F. Red Deer Canine Pendants

Row	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 2	23	3	13%	79	22.5	44	6	13.2
E	5	1	20%	34	n/a	34	3	11.3
F	6	1	17%	1	n/a	1	1	1.0
G	5	0						
H	5	1	20%	44	n/a	44	2	22.0
M	2	0						
Group 2–L	3	1	33%	7	n/a	7	1	7.0
Row K	4	0						

The uniqueness of Row L is further underscored by the structure of the grave goods assemblage from Row K, the only other row at Shamanka II with a NE–SW orientation, located at the opposite end of the cemetery and belonging to Group 1. The 4 graves of Row K, with a total of 5 individuals (3 Males and 2 Females), have 27 objects overall, of which 23 are Bow & Arrow (all from Gr. 46 with 1 male interred also with 2 bows; Fig. 5.20) and the remaining are 1 each of Composite Tools & Weapons, Knives, Other Mass-Ornaments, and Non-mass Ornaments. In contrast, Row L has a total of 2067 objects, of which 37 are Bow & Arrow, 41 are Composite Tools & Weapons, 20 are Fishing Gear, 3 are Knives, and 1966 are adornments, of which only 1 is a Non-mass Ornament. The contrast is stark and excluding Grave 44 in Row K with one burial each from Phase 1 and Phase 2 and containing only one object from the five main groups of grave goods does not affect this comparison. The significance of the differences between these two rows is discussed further in Chapter 8.

A

B



C

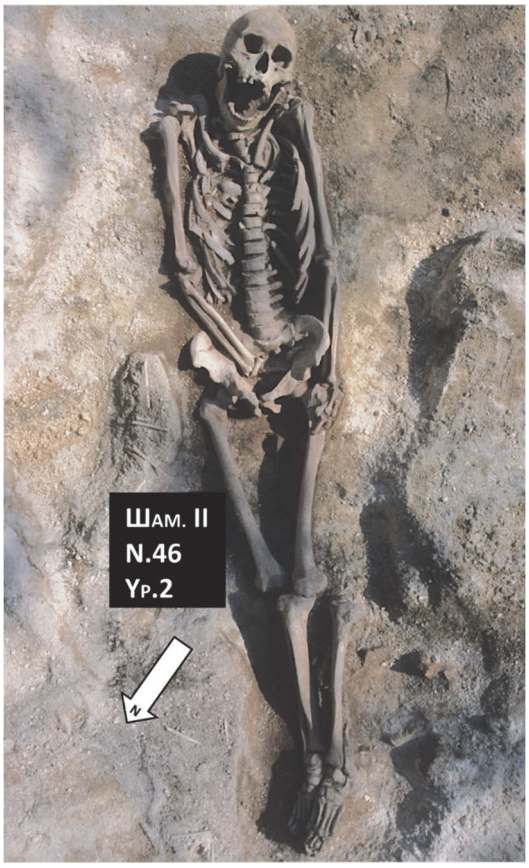
D

Figure 5.18. Shamanka II, Grave 115. Figure A by the BAP; B–D by P. Kurzybov:

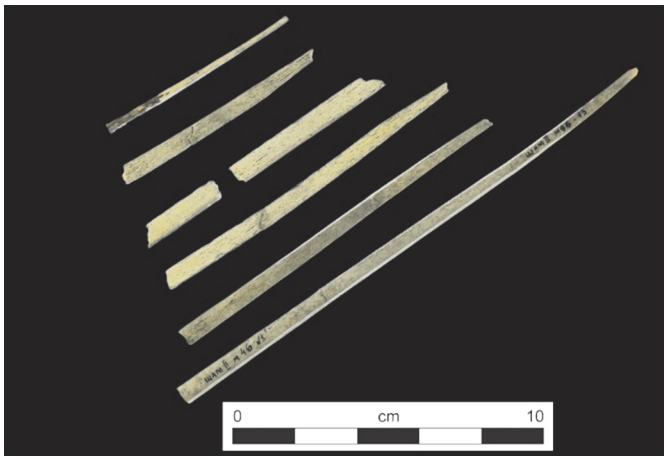
A. Burial level
B. Siliceous argillite tablets with edge retouch, including two knives: top left and bottom, second from left
C. Stone arrowheads
D. Antler spoon

Figure 5.19. Shamanka II, Grave 116. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Antler tools
C. Composite tool (weapon)
D. Bow stiffeners



A



B

C

D

Figure 5.20. Shamanka II, Grave 46. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Fragments of bow stiffeners
C. Bow stiffeners
D. Micro-quartzite blade-flake

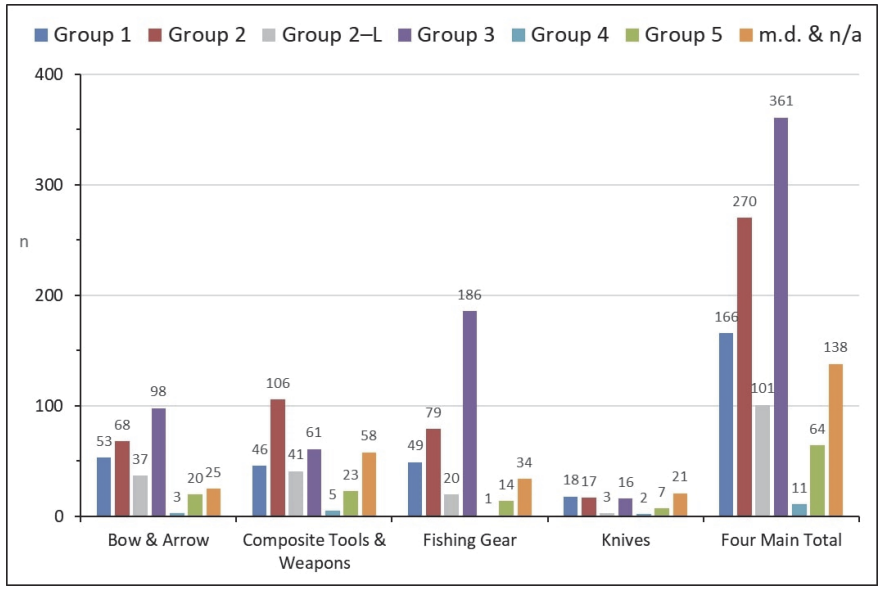
8. Group 2 (Phase 1) vs. Group 5 (Phase 2)

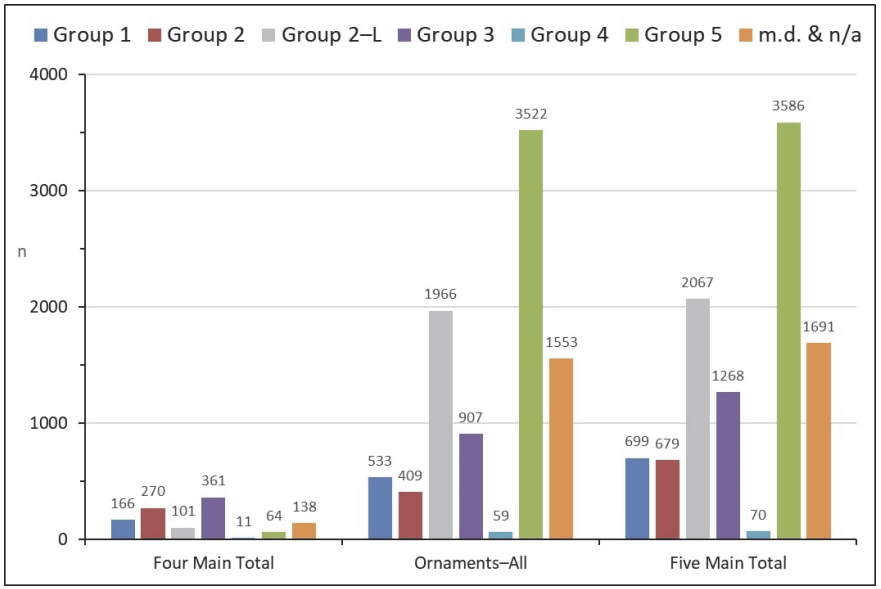
Comparison between Groups 2 and 5 merits additional attention due to the fact that their dietary trends are very similar: an increased consumption of local Kultuk Bay fishes of similar species structure — and, perhaps, Baikal seal — over time (Chapter 2; Weber et al., 2016a; Weber et al., 2021). There are however a few differences in terms of history and archaeological expression. Not only are the two trends separated by a chronological gap, anywhere from a few generations to a few hundred years, but Group 5, lasting perhaps also only a few generations, is much shorter in duration. Also, while Group 2 is easily identifiable spatially by the rows of graves in the SE Cluster (of which Rows E–H form a tight arrangement), Group 5 lacks such a spatial identity. Phase 2 saw the construction of scattered and row graves in all three spatial units and, on a few occasions, graves built during Phase 1 were re-opened and new burials were interred. Therefore, it is useful to assess to what extent the chronological disconnect observed between the dietary trends (which are similar) and the differences in spatial distributions extend to grave goods assemblages.

Even though the numbers of graves (23 in Group 2 vs. 10 and Group 5; Table 3.2) and burials (52 vs. 21) are quite different, the general sex structures are very similar: both groups are equally dominated by Male burials (56% vs. 52%), and both have some Females (27% vs. 19%) and Children (12% vs. 24%; Table 4.16). Consequently, this comparison includes all graves allocated to each group without restricting the examination to single-sex graves.

In general terms, the differences between Phase 1 (i.e., Groups 1–4) and Phase 2 (i.e., Group 5) graves presented earlier come now into even sharper focus (Fig. 5.21; Fig. 5.22; Table 5.10; Table 5.11). All five main groups of grave goods are equally common but the maxima, averages per burial, and standard deviations are quite different for most categories and particularly so for the sub-categories of adornments. Thus:

- Bow & Arrow are present in 12 (52%) graves in Group 2 and 5 (50%) in Group 5, and the maxima (12 vs. 10), averages (2.8 vs. 2.9), and standard deviations (4.3 vs. 3.9) are about the same;
- Composite Tools & Weapons are present in 13 (57%) graves in Group 2 and 7 (70%) in Group 5, and the maximum, average, and standard deviation are much higher in Group 2: 39, 4.2, and 10.4 vs. 9, 2.3, and 2.8;
- Fishing Gear is present in 11 (48%) graves in Group 2 and 4 (40%) in Group 5, and the maximum, average, and standard deviation are also higher for Group 2: 37, 4.0, and 10.4 vs. 6, 2.0, and 2.1;
- Knives are present in 5 (22%) graves in Group 2 and 3 (30%) in Group 5, and the maximum, average, and standard deviation are higher again for Group 2: 9, 2.4 and 3.4 vs. 3, 1.4 and 0.6;
- Non-mass Ornaments are present in 11 (48%) graves in Group 2 and 4 (40%) in Group 5, and the maximum, average, and standard deviation are higher for Group 2: 11, 2.2, and 3.8 vs. 2, 1.0, and 0.6;
- Although Red Dear Canine Pendants are present in only 3 (13%) graves in Group 2 and 4 (40%) in Group 5, the maximum, average, and standard deviation are still higher for Group 2: 44, 13.2, and 22.5 vs. 16, 6.0, and 5.7;
- Bone Pendants are absent in Group 2 and present in 5 (50%) graves in Group 5, with the maximum (210), average (55.3), and standard deviation (86.0) much higher than for Red Deer Canine Pendants from either group;
- Other Mass Ornaments are present in 13 (57%) graves in Group 2 and 6 (60%) in Group 5, and the maximum, average, and standard deviation are much higher for Group 5: 988, 343.7, and 396.5 vs. 67, 13.5, and 22.9; and
- In the 10 graves of Group 5 there are almost 10 times as many Mass Ornaments (n = 3516) as in the 23 graves of Group 2 (n = 362).





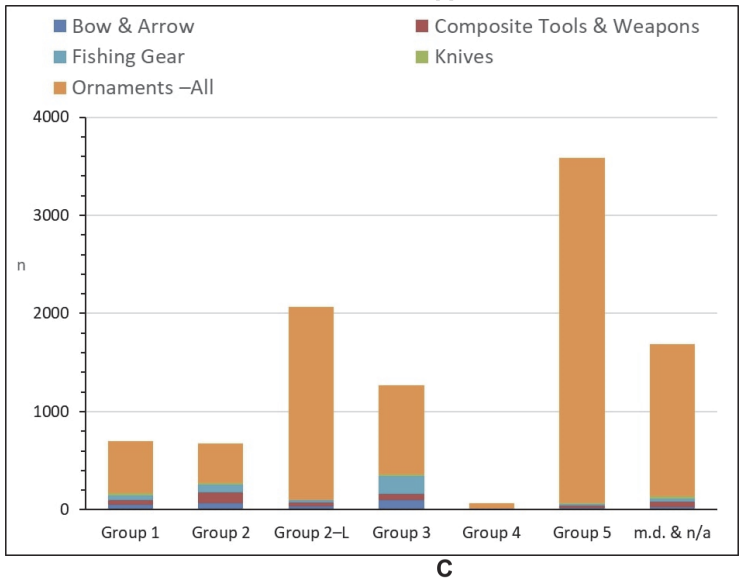


Figure 5.21. Shamanka II, Abundance of grave good categories by Main Unit of Analysis (after Table 5.10). Figure by chapter authors:

A. Four main utilitarian categories
B. Four main total, Ornaments–All and Five main total
C. Five main categories

Table 5.10. Shamanka II: Quantitative metrics for five main categories of Grave Goods by Main Unit of Analysis. Note: "0" values have been removed. A – Bow & Arrow; B – Composite Tools & Weapons; C – Fishing Gear; D – Knives; E – Ornaments–All

A. Bow & Arrow

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	6	26%	53	10.1	23	8	6.6
Group 2	23	12	52%	68	4.3	12	24	2.8
Group 2–L	3	3	100%	37	9.3	20	4	9.3
Group 3	18	8	44%	98	13.3	37	14	7.0
Group 4	5	1	20%	3	n/a	3	1	3.0
Group 5	10	5	50%	20	3.9	10	7	2.9
m.d.	8	3	38%	20	2.5	9	8	2.5
n/a	7	1	14%	5		5	2	2.5
Total	97	39	40%	304	8.3	37	68	4.5

B. Composite Tools & Weapons

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	10	43%	46	4.2	11	15	3.1
Group 2	23	13	57%	106	10.4	39	25	4.2
Group 2–L	3	3	100%	41	8.5	22	4	10.3
Group 3	18	8	44%	61	3.9	13	16	3.8
Group 4	5	2	40%	5	2.1	4	2	2.5
Group 5	10	7	70%	23	2.8	9	10	2.3
m.d.	8	4	50%	34	3.1	13	12	2.8
n/a	7	5	71%	24	4.0	10	14	1.7
Total	97	52	54%	340	6.6	39	98	3.5

C. Fishing Gear

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	5	22%	49	9.9	23	7	7.0
Group 2	23	11	48%	79	10.4	37	20	4.0
Group 2–L	3	2	67%	20	7.1	15	3	6.7
Group 3	18	7	39%	186	25.9	72	13	14.3
Group 4	5	1	20%	1	n/a	1	1	1.0
Group 5	10	4	40%	14	2.1	6	7	2.0
m.d.	8	4	50%	29	3.9	12	12	2.4
n/a	7	2	29%	5	0.7	3	4	1.3
Total	97	36	37%	383	15.1	72	67	5.7

D. Knives

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	7	30%	18	1.4	4	9	2.0
Group 2	23	5	22%	17	3.4	9	7	2.4
Group 2–L	3	2	67%	3	0.7	2	3	1.0
Group 3	18	6	33%	16	2.3	7	12	1.3
Group 4	5	2	40%	2	0.0	1	2	1.0
Group 5	10	3	30%	7	0.6	3	5	1.4
m.d.	8	5	63%	9	1.1	3	16	0.6
n/a	7	6	86%	12	2.4	7	17	0.7
Total	97	36	37%	84	1.9	9	71	1.2

E. Ornaments–All

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	15	65%	533	88.0	329	20	26.7
Group 2	23	16	70%	409	29.8	110	29	14.1
Group 2–L	3	3	100%	1966	951.2	1752	4	491.5
Group 3	18	11	61%	907	108.8	331	19	47.7
Group 4	5	1	20%	59	n/a	59	1	59.0
Group 5	10	8	80%	3522	372.2	998	11	320.2
m.d.	8	4	50%	130	33.3	73	15	8.7
n/a	7	5	71%	1423	363.9	899	16	88.9
Total	97	63	65%	8949	301.5	1752	115	77.8

Table 5.11. Shamanka II: Quantitative metrics for Ornaments by Main Unit of Analysis. Note: most "0" values have been removed. A – Mass Ornaments; B – Non-mass Ornaments; C – Red Deer Canine Pendants; D – Bone Pendants; E – Other Mass Ornaments

A. Mass Ornaments

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	12	52%	522	97.5	329	12	43.5
Group 2	23	14	61%	362	29.9	106	24	15.1
Group 2–L	3	3	100%	1965	951.5	1752	4	491.3
Group 3	18	9	50%	874	114.6	329	16	54.6
Group 4	5	1	20%	59	n/a	59	1	59.0
Group 5	10	7	70%	3516	353.5	997	10	351.6
m.d.	8	3	38%	113	31.3	71	10	11.3
n/a	7	4	57%	1400	380.9	899	13	107.7
Total	97	53	55%	8811	322.9	1752	90	97.9

B. Non-mass Ornaments

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	5	22%	11	1.6	5	10	1.1
Group 2	23	11	48%	47	3.8	11	21	2.2
Group 2–L	3	1	33%	1	n/a	1	2	0.5
Group 3	18	10	56%	33	2.5	8	18	1.8
Group 4	5	0						
Group 5	10	4	40%	6	0.6	2	6	1.0
m.d.	8	4	50%	17	5.9	13	15	1.1
n/a	7	3	43%	23	9.1	18	12	1.9
Total	97	38	39%	138	3.9	18	84	1.6

C. Red Deer Canine Pendants

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	0						
Group 2	23	3	13%	79	22.5	44	6	13.2
Group 2–L	3	1	33%	7	n/a	7	1	7.0
Group 3	18	2	11%	76	8.5	44	4	19.0
Group 4	5	0						
Group 5	10	4	40%	36	5.7	16	6	6.0
m.d.	8	2	25%	77	41.7	68	6	12.8
n/a	7	3	43%	29	8.1	19	8	3.6
Total	97	15	15%	304	19.8	68	31	9.8

D. Bone Pendants

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	0						
Group 2	23	0						
Group 2–L	3	0						
Group 3	18	0						
Group 4	5	0						
Group 5	10	5	50%	387	86.0	210	7	55.3
m.d.	8	0						
n/a	7	0						
Total	97	5	5%	387	86.0	210	7	55.3

E. Other Mass Ornaments

MUA	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	12	52%	522	97.5	329	12	43.5
Group 2	23	13	57%	283	22.9	67	21	13.5
Group 2–L	3	3	100%	1958	947.5	1745	4	489.5
Group 3	18	9	50%	798	112.7	329	16	49.9
Group 4	5	1	20%	59	n/a	59	1	59.0
Group 5	10	6	60%	3093	396.5	988	9	343.7
m.d.	8	2	25%	36	21.2	33	6	6.0
n/a	7	4	57%	1371	373.8	880	13	105.5
Total	97	50	52%	8120	330.2	1745	82	99.0

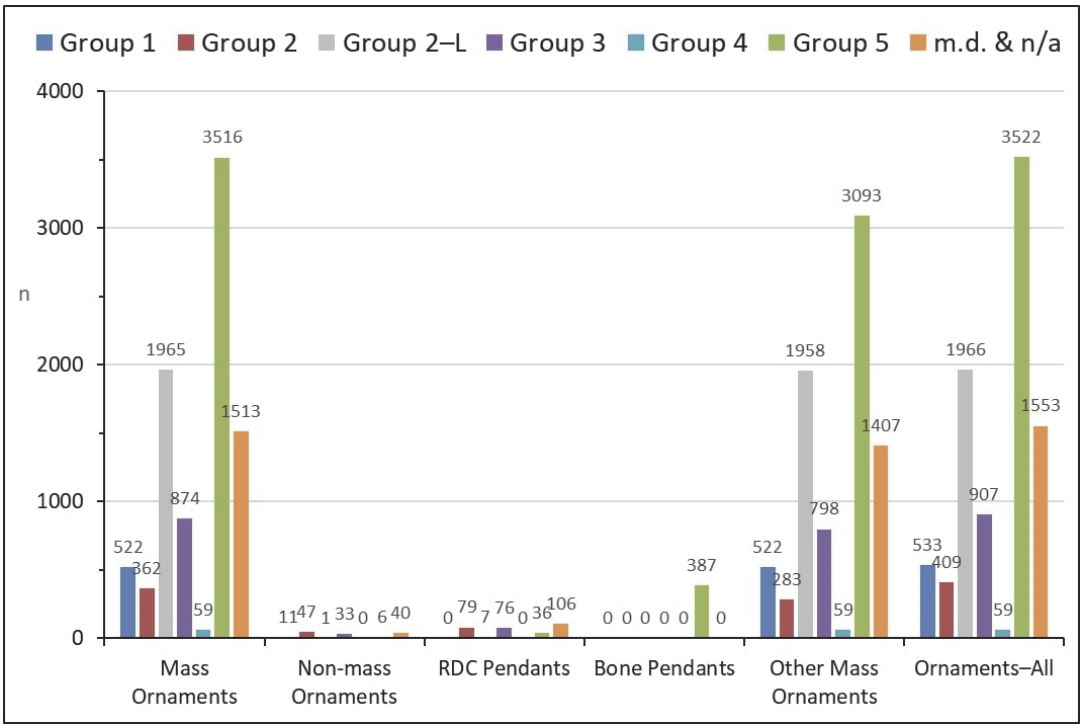


Figure 5.22. Shamanka II, Abundance of Ornaments by Main Unit of Analysis (after Table 5.11). Figure by chapter authors

The cultural significance of the contrast in distribution of utilitarian grave goods and adornments will be discussed in Chapter 8.

9. Summary

The Shamanka II grave goods assemblage (limited to the five categories examined in detail) is characterized by substantial variation in prevalence rates (i.e., presence–absence) and quantities (i.e., abundance) of both utilitarian objects and adornments. This variation is observable at the level of the entire cemetery and continues through to the more specific units of analysis, however, the emphasis frequently changes from one category to another. Because of the imbalance in the sex structures of Groups 1, 2, 3, and 5, most of the following general observations are particularly applicable to Male graves.

Male grave goods assemblages are richer and more diverse with regard to all grave goods categories than Female or Child assemblages, the latter two showing some similarities to each other. Considering all grave goods (i.e., including those other than the five main groups), close to half of Child graves have none whatsoever, a few Male graves have none, and even the poorest Female graves have at least some items. Limiting analysis to the five main categories, well over half of Child graves have no such items, while a few Female and Male graves also lack any. Not a single grave goods category is restricted to Male, Female or Child graves, though Bow & Arrow comes close as it is completely absent from Child graves and present in only 1 Female grave. Surprisingly perhaps, Composite Tools & Weapons and Knives are relatively common in Child graves.

There are two main differences between Phase 1 and Phase 2 grave accoutrements: (1) while variable in both phases, the variation in the number of Mass-Ornaments among Phase 2 graves is substantially higher; and (2) Bone Pendants are known exclusively from Phase 2 graves. The three main units from Phase 1 also show some marked differences:

- Group 1 is the least diverse in terms of grave goods categories but relatively variable in terms of quantities;
- Group 2 is quite diverse in kind and rather balanced both in terms of prevalence rates and quantitative metrics; and
- Group 3 is as diverse as Group 2 but the numbers are even more variable than in Group 1.

In sum, the Male grave goods assemblage of Group 1 appears to be a poorer version of the other two Male assemblages — particularly so when compared to Group 3.

The four main rows of Group 2 (E, F, G, and H) are similar in grave goods structure. All four have at least one grave with Red Deer Canine Pendants and Row F has three — the highest number of all 13 rows. Row L, a unit of analysis on its own (Group 2–L from Phase 1), stands out from all other rows due to the high number of grave goods, dominated by Mass Ornaments but also with a relatively high number of Bow & Arrow, Composite Tools and Weapons, and Fishing Gear. This is especially unusual considering that the row consists of two single Male burials and one double-burial of a Female with a Young Child, a configuration typically interred with few grave goods in other parts of the cemetery.

Considering that the members of Groups 2, 3, and 5 experienced dietary trends towards an increased reliance on fish, the prevalence and quantities of Fishing Gear in these three groups is not particularly high, though still higher than in Group 1 whose members show no dietary trend. The grave goods assemblage of Group 5 (Phase 2), which repeats the dietary trend observed for Group 2 from Phase 1, seems best referred to as an "impoverished" but "embellished" version of the earlier assemblage: a lower number but similar assortment of utilitarian objects and a much higher number of Mass-Ornaments, including the exclusive presence of Bone Pendants, as well as lower quantities of Non-mass Ornaments per burial.

Exploration of mortuary variation at the EN Shamanka II cemetery continues in Chapter 6 where a few additional variables are analyzed.

Chapter 6. Variation in some other aspects of mortuary practices

Andrzej W. Weber, Vladimir I. Bazaliiskii, Erin Jessup

1. Introduction

The goal of this chapter is to examine a few characteristics that have not been analyzed in Chapters 4 and 5, including the use of fire, zoomorphic art, needle cases, bear skeletal remains, and foreign human bones. All mortuary variables examined here are either rare within the Kitoi mortuary tradition, idiosyncratic to Shamanka II, or have never been examined systematically in the context of other mortuary characteristics (Bazaliiskii, 2010). Mortuary use of fire has not been recorded at other Kitoi cemeteries at all but at Shamanka II ash pits have been found in many graves. Zoomorphic art, mostly in the form of effigies of animal heads made of antler or bone, is known from other Kitoi cemeteries but the prevalence and abundance rates are invariably low (Losey et al., 2021). Needle cases are relatively common at most other Kitoi cemeteries and occur also in graves of all other Neolithic and Early Bronze Age mortuary traditions in Cis-Baikal, however, their association with other variables (e.g., sex and age of the burials) has never been explored. Bear remains, like zoomorphic art, are not restricted to Shamanka II but the assortment and quantities are much greater here than elsewhere. Lastly, the presence of foreign human bones in Kitoi graves appears to have been documented only at Shamanka II although, of the other relevant collections of human remains, only Lokomotiv has been examined with sufficient attention to detail to demonstrate their absence (BAP unpublished data). All these faunal skeletal remains are additionally examined in Chapter 7 while more information on the foreign human bones is provided in detailed descriptions of the human skeletal remains (Bazaliiskii et al., 2024; Lieverse et al., 2024).

2. Approach

The approach employed in the examination of Shamanka's mortuary variation at the Grave, Burial, and Grave Goods levels — described in detail in Chapter 3 — was considered generally appropriate also for this analysis with only a few modifications. More specifically, the approach to defining dependent (i.e., mortuary characteristics under examination) and independent variables (e.g., phases of cemetery use, sex of burials, or Main Units of Analysis — MUAs;[39] Table 6.1), employed to search for meaningful

[39] See Chapter 3 for the definition.

patterns, is the same. Thus, zoomorphic art, needle cases, use of fire, bear skeletal remains, and foreign human bones are considered additional characteristics describing Shamanka's mortuary protocol at the Grave Level.

Table 6.1. Main Units of Analysis

Phase	MUA	Description	Dietary trend
Phase 1	Group 1	NW and S Cluster burials from graves in Rows A, B, C, D, I, J, and K	No dietary trend when analyzed together or separately
Phase 1	Group 2	SE Cluster burials from graves in Rows E, F, G, H, and M	Increasing consumption of local Kultuk Bay fishes (and, perhaps, some Baikal seal)
Phase 1	Group 2–L	SE Cluster burials from graves in Row L (3 adults and 1 infant)	Sample too small to demonstrate a dietary trend
Phase 1	Group 3	NW and SE Cluster burials from scattered graves	Increasing consumption of local Kultuk Bay fishes (of different species structure than Groups 2, 4 and 5)
Phase 1	Group 4	S Cluster burials from scattered graves	Dietary trend similar to Groups 2 and 5 but narrowly missing statistical significance
Phase 2	Group 5	All Phase 2 burials: NW, SE and S Cluster burials from row and scattered graves	Increasing consumption of local Kultuk Bay fishes (and, perhaps, some Baikal seal)

Use of fire is treated in the same way as, for example grave disturbances, and measured on the nominal scale only (Presence/Absence in this case). Zoomorphic art, needle cases, bear remains, and foreign human bones are treated in the same way as Grave Goods, in that they are also associated with a grave rather than with a specific individual (burial) in the grave. While all these variables are measured on the nominal scale (Present or Absent), the ratio scale was practical only for some because of the frequently very low abundances (i.e., quantities). A few variables (e.g., Bear Crania and Foreign Human Bones) are measured by an additional nominal variable in order to account for their vertical placement within the grave. The entire dataset consisting of the mortuary characteristics examined here and all other Grave Level variables (e.g., spatial, chronological etc.) employed in the analysis, as well as the accompanying code book, are presented in supplements to the complete edition of this monograph (Jessup et al., 2024a; Jessup et al., 2024b).

The generally low prevalence and abundance rates for all variables examined in this chapter also mean that many elements of the quantitative analysis employed in the assessment of variation at the Burial, Grave, and Grave Goods levels in Chapters 4 and 5 are not particularly practical or informative in this analysis. Therefore, the range of independent variables and the number of comparisons used in this chapter have been substantially reduced. However, as before, examination is still based mainly on assessment of contingency tables made with the help of the Pivot Tables function in Microsoft Excel as well as, to a lesser extent, on descriptive statistics and additional quantitative metrics. Descriptive statistics in Table 6.2 are calculated for all graves within the analytical units examined while additional metrics in Table 6.3 and many contingency tables include, as in Chapter 5, only graves with the analyzed variable present. Also like in Chapter 5, assessment of distribution by sex is limited to graves with burials of the same sex only.

The low quantities also require that conclusions drawn from all quantitative metrics are viewed with caution (Fig. 6.1; Fig. 6.2; Table 6.2; Table 6.3; Table 6.4). For example, the bear skeletal remains (BearAll) is the most abundant category of objects in the analyzed dataset. However, at Shamanka II there are still only 96 such items recorded in 97 Kitoi graves and after dividing them into more specific categories (e.g., Bear Bacula or Crania)

the numbers range only from 10 to 53. Represented by 14 objects overall, Zoomorphic Art is also rare. In contrast, of the grave goods examined in Chapter 5, Knives are the least numerous (n = 84) but still much more abundant than any of the individual categories examined here, while many other categories are in the 300–400 range (e.g., Bow & Arrow, Composite Tools & Weapons, and Fishing Gear), and Other Mass Ornaments are in the thousands. In sum, for the grave goods examined in this chapter, the prevalence rates (Present or Absent) are perhaps more informative than the descriptive statistics and other quantitative metrics.

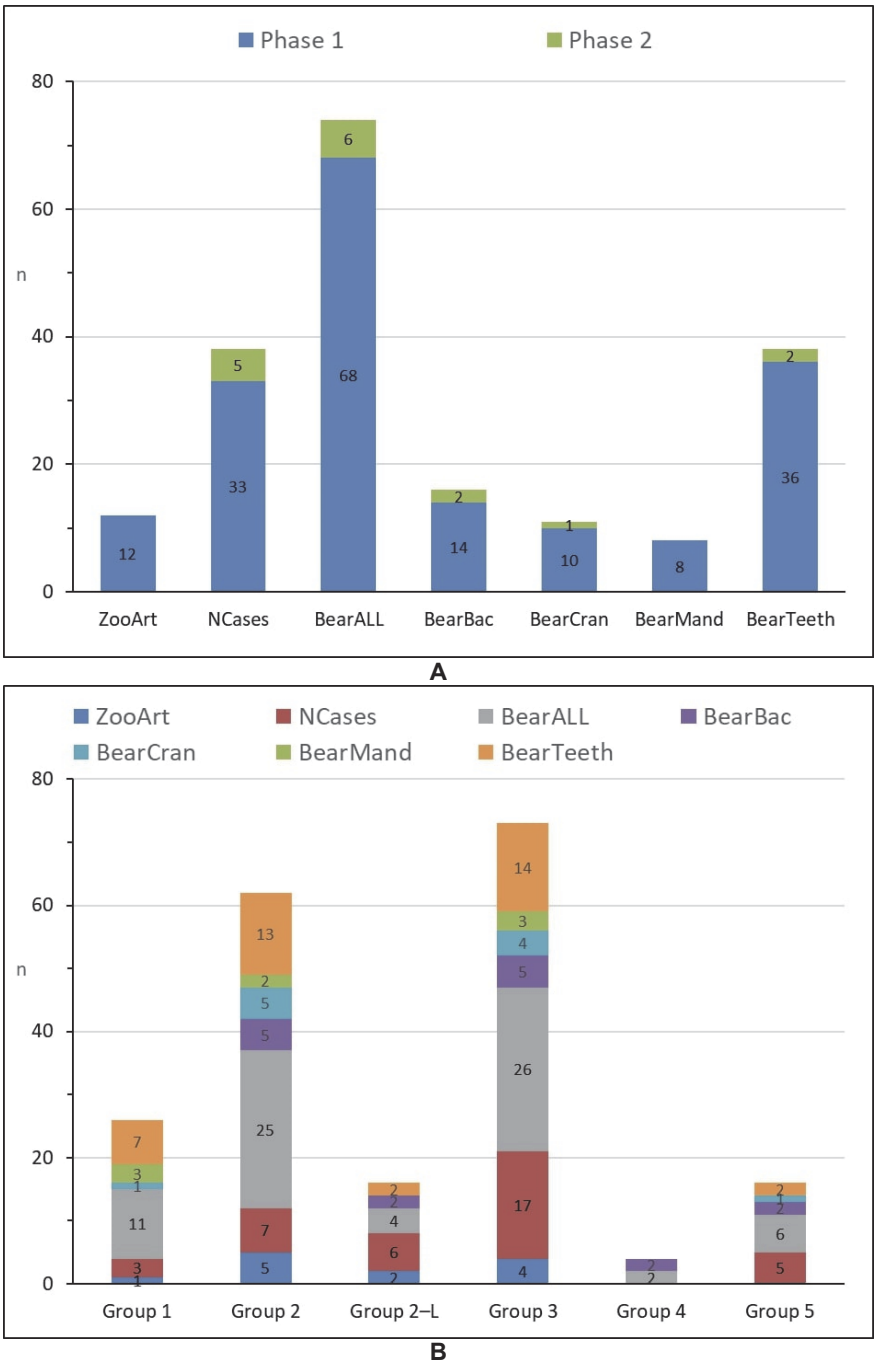


Figure 6.1. Shamanka II, Distribution of Zoomorphic Art, Needle Cases and Bear Remains (after Table 6.2). Zeros have been removed for readability. Figure by chapter authors:

A. By Phase
B. By Main Unit of Analysis

Table 6.2. Descriptive statistics for Zoomorphic Art, Needle Cases and Bear Remains in various units of analysis

A. All Graves (n = 97)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.1	0.5	1.0	0.2	0.2	0.1	0.5
Median	0	0	0	0	0	0	0
S.d.	0.52	1.52	2.0	0.6	0.4	0.4	1.4
Maximum	4	9	9	3	2	2	7
Sum	14	50	96	16	15	10	53

B. Phase 1 (n = 72)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.2	0.5	0.9	0.2	0.1	0.1	0.5
Median	0	0	0	0	0	0	0
S.d.	0.56	1.42	2.0	0.7	0.4	0.4	1.3
Maximum	4	9	9	3	2	2	7
Sum	12	33	68	14	10	8	36

C. Phase 2 (Group 5) (n = 10)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.0	0.5	0.6	0.2	0.1	0.0	0.2
Median	0	0	0	0	0	0	0
S.d.	0.00	1.27	0.8	0.4	0.3	0.0	0.6
Maximum	0	4	2	1	1	0	2
Sum	0	5	6	2	1	0	2

D. Group 1 (n = 23)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.0	0.1	0.5	0.0	0.0	0.1	0.3
Median	0	0	0	0	0	0	0
S.d.	0.21	0.46	1.9	0.0	0.2	0.3	1.5
Maximum	1	2	9	0	1	1	7
Sum	1	3	11	0	1	3	7

E. Group 2 (n = 23)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.2	0.3	1.1	0.2	0.2	0.1	0.6
Median	0	0	0	0	0	0	0
S.d.	0.42	0.93	1.9	0.7	0.4	0.3	1.3
Maximum	1	4	7	3	1	1	5
Sum	5	7	25	5	5	2	13

F. Group 2–L (n = 3)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.7	2.0	1.3	0.7	0.0	0.0	0.7
Median	1	0	1	0	0	0	1
S.d.	0.58	3.46	1.5	1.2	0.0	0.0	0.6
Maximum	1	6	3	2	0	0	1
Sum	2	6	4	2	0	0	2

G. Group 3 (n = 18)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.2	0.9	1.4	0.3	0.2	0.2	0.8
Median	0	0	0	0	0	0	0
S.d.	0.94	2.18	2.5	0.8	0.6	0.5	1.5
Maximum	4	9	9	3	2	2	5
Sum	4	17	26	5	4	3	14

H. Group 4 (n = 5)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0	0	0.4	0.4	0.0	0.0	0.0
Median	0	0	0	0	0	0	0
S.d.	0	0	0.9	0.9	0.0	0.0	0.0
Maximum	0	0	2	2	0	0	0
Sum	0	0	2	2	0	0	0

I. Group 5 (Phase 2) (n = 10)

Metric	ZooArt	NCases	BearALL	BearBac	BearCran	BearMand	BearTeeth
Mean	0.0	0.5	0.6	0.2	0.1	0.0	0.2
Median	0	0	0	0	0	0	0
S.d.	0.00	1.27	0.8	0.4	0.3	0.0	0.6
Maximum	0	4	2	1	1	0	2
Sum	0	5	6	2	1	0	2

Table 6.3. Quantitative metrics for Zoomorphic Art, Needle Cases and Bear Remains in various units of analysis. Note: most “0” values have been removed

A. Zoomorphic Art

Unit of Analysis	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	1	4%	1		1	2	0.5
Group 2	23	5	22%	5	0.0	1	10	0.5
Group 2–L	3	2	67%	2	0.0	1	3	0.7
Group 3	18	1	6%	4		4	4	1.0
Group 4	5	0						
Group 5	10	0						
m.d.	8	0						
n/a	7	1	14%	2		2	2	1.0
Total	97	10	10%	14	1.0	4	21	0.7

B. Needle Cases

Unit of Analysis	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	2	9%	3	0.7	2	3	1.0
Group 2	23	3	13%	7	1.5	4	4	1.8
Group 2–L	3	1	33%	6	0.0	6	2	3.0
Group 3	18	6	33%	17	3.1	9	12	1.4
Group 4	5	0						
Group 5	10	2	20%	5	2.1	4	3	1.7
m.d.	8	2	25%	4	0.0	2	9	0.4
n/a	7	1	14%	8	0.0	8	2	4.0
Total	97	17	18%	50	2.5	9	35	1.4

C. Bear All

Unit of Analysis	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	3	13%	11	4.6	9	4	2.8
Group 2	23	9	39%	25	2.2	7	18	1.4
Group 2–L	3	2	67%	4	1.4	3	3	1.3
Group 3	18	7	39%	26	2.8	9	14	1.9
Group 4	5	1	20%	2	0.0	2	1	2.0
Group 5	10	4	40%	6	0.6	2	5	1.2
m.d.	8	3	38%	3	0.0	1	13	0.2
n/a	7	3	43%	19	1.2	7	9	2.1
Total	97	32	33%	96	2.5	9	67	1.4

D. Bear Bacula

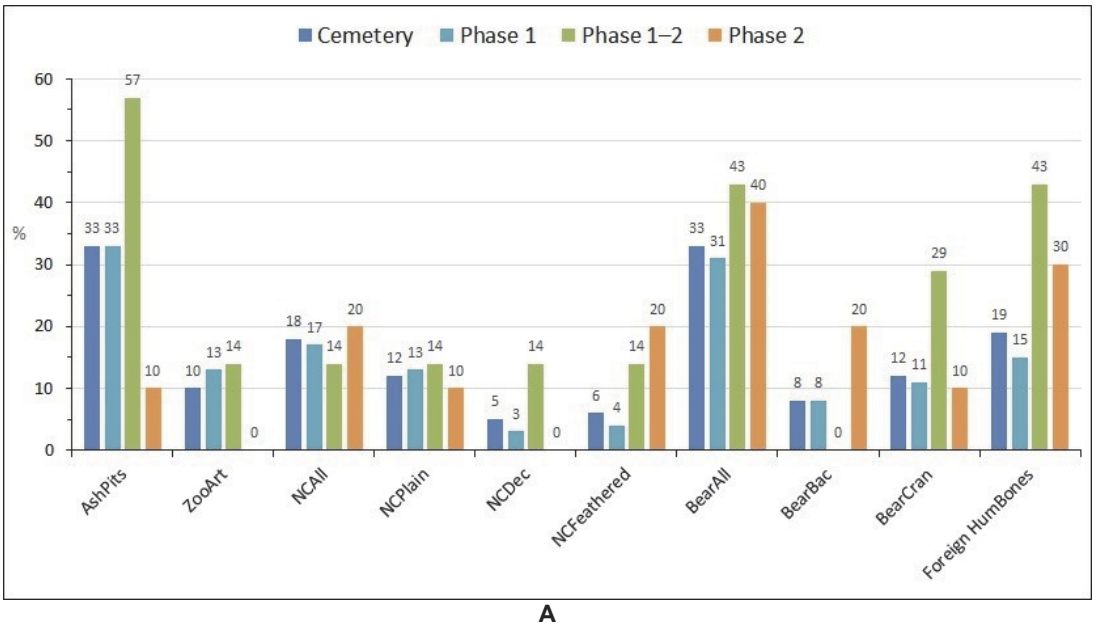
Unit of Analysis	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	0						
Group 2	23	2	9%	5	0.7	3	4	1.3
Group 2–L	3	1	33%	2	0.0	2	1	2.0
Group 3	18	2	11%	5	0.7	3	6	0.8
Group 4	5	1	20%	2	0.0	2	1	2.0
Group 5	10	2	20%	2	0.0	1	2	1.0
m.d.	8	0						
n/a	7	0						
Total	97	8	8%	16	0.8	3	14	1.1

E. Bear Crania

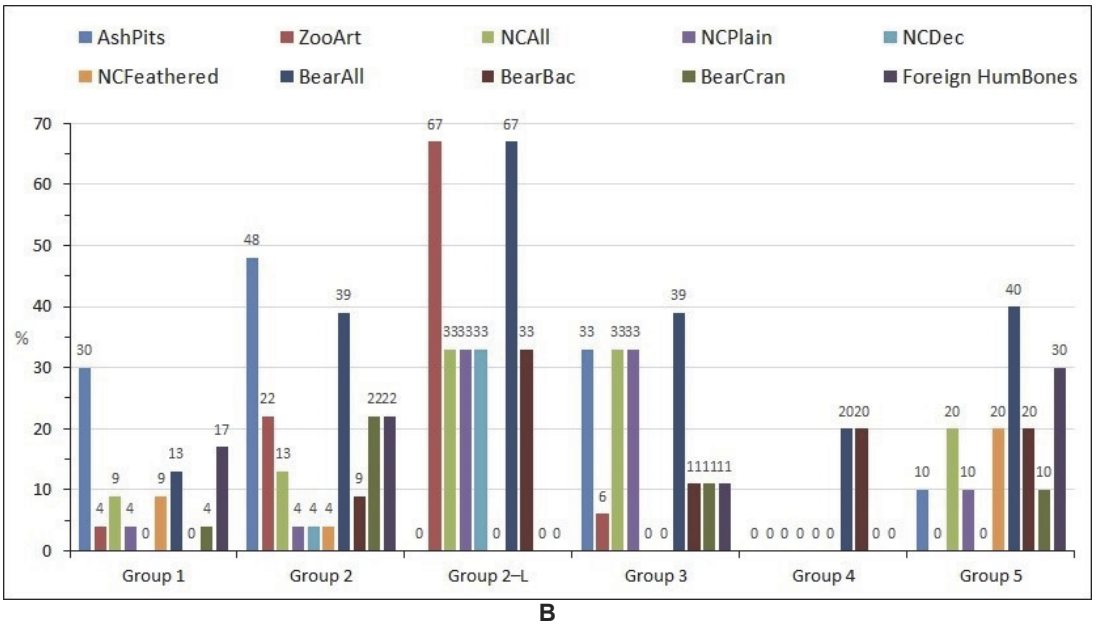
Unit of Analysis	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	1	4%	1	0.0	1	2	0.5
Group 2	23	5	22%	5	0.0	5	5	1.0
Group 2–L	3	0						
Group 3	18	2	11%	4	0.0	4	2	2.0
Group 4	5	0						
Group 5	10	1	10%	1	0.0	1	2	0.5
m.d.	8	1	13%	1	0.0	1	5	0.2
n/a	7	2	29%	3	0.7	3	2	1.5
Total	97	12	12%	15	0.5	15	5	3.0

F. Bear Teeth

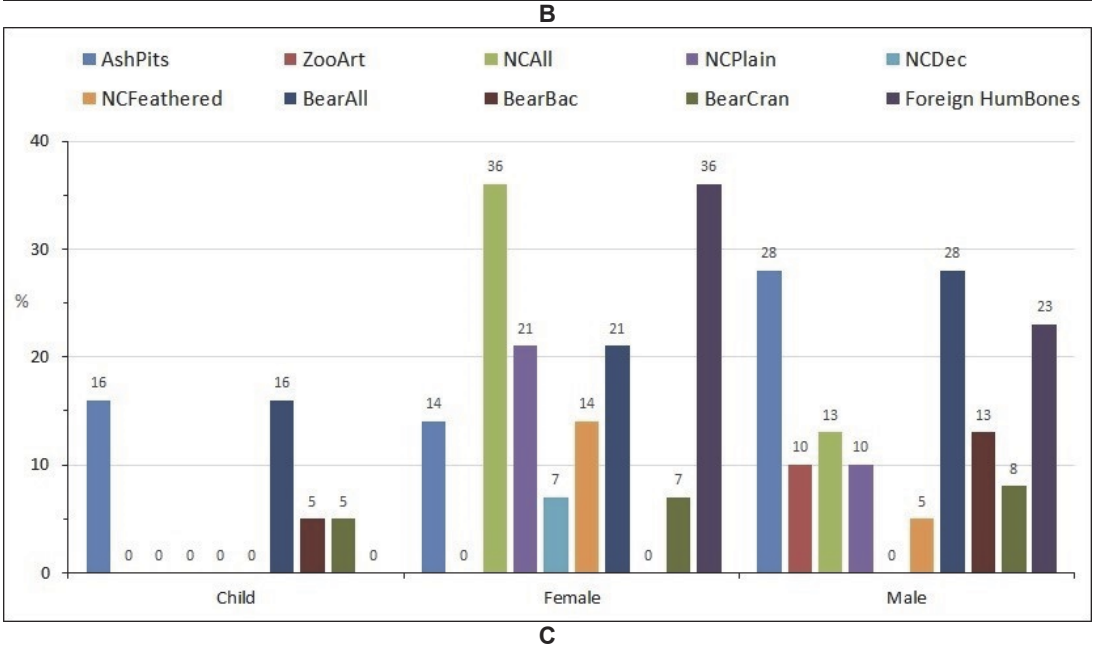
Unit of Analysis	Graves [n]	Graves present [n]	Graves present [%]	Sum	S.d.	Max.	Burials present [n]	Per burial present
Group 1	23	1	4%	7	0.0	7	2	3.5
Group 2	23	6	26%	13	1.8	5	5	2.6
Group 2–L	3	2	67%	2	0.0	1	2	1.0
Group 3	18	5	28%	14	1.5	5	4	3.5
Group 4	5	0						
Group 5	10	1	10%	2	0.0	2	1	2.0
m.d.	8	2	25%	2	0.0	1	4	0.5
n/a	7	3	43%	13	1.5	6	5	2.6
Total	97	20	21%	53	1.9	7	5	10.6


Cemetery
Phase 1
Phase 1–2
Phase 2
%
AshPits
ZooArt
NCAll
NCPlain
NCDec
NCFeathered
BearAll
BearBac
BearCran
Foreign HumBones

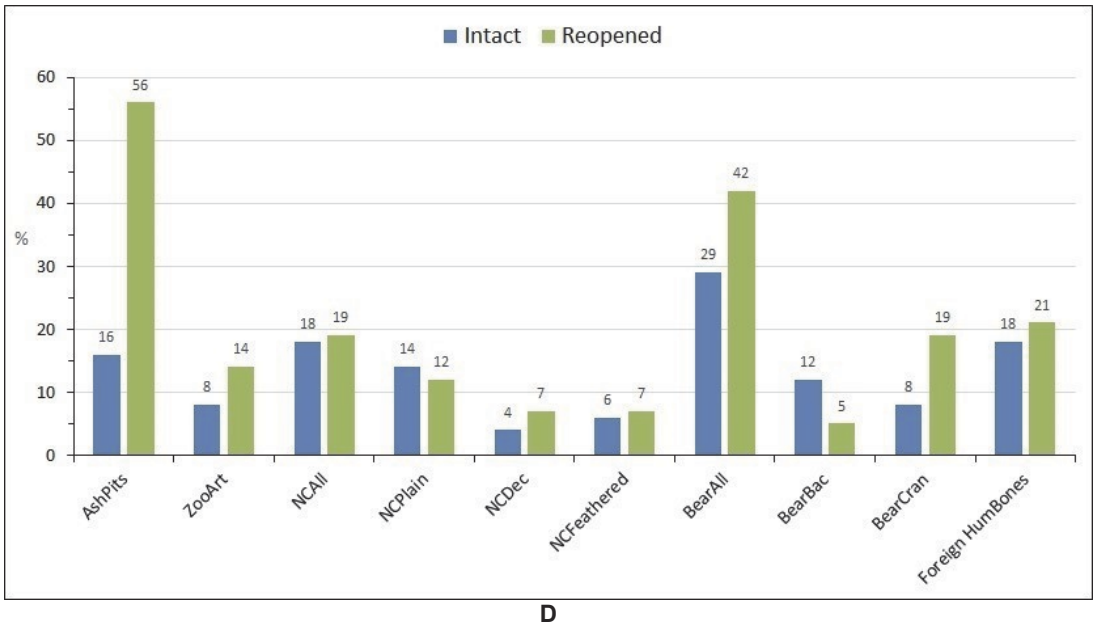
A


AshPits
ZooArt
NCAll
NCPlain
NCDec
NCFeathered
BearAll
BearBac
BearCran
Foreign HumBones
%
Group 1
Group 2
Group 2–L
Group 3
Group 4
Group 5

B


AshPits
ZooArt
NCAll
NCPlain
NCDec
NCFeathered
BearAll
BearBac
BearCran
Foreign HumBones
%
Child
Female
Male

C



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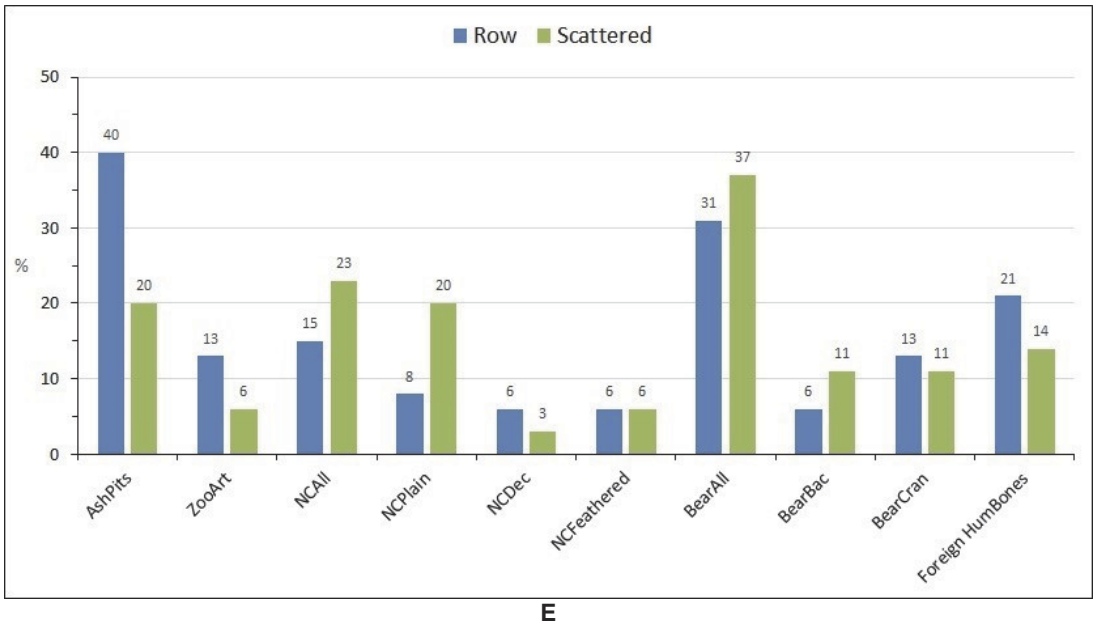


E

Figure 6.2. Shamanka II, Presence and Absence analysis for Ash Pits, Zoomorphic Art, Needle Cases, Bear Remains and Foreign Human Bones (after Table 6.4). Figure by chapter authors:

A. By Phase
B. By Main Unit of Analysis
C. By Sex
D. By Condition
E. By Formation

The analysis is organized in the following manner. Each section begins with a descriptive introduction of the analyzed mortuary characteristic and any additionally pertinent methodological information. Next, the examination progresses from the most general units of analysis (i.e., entire cemetery or phases) to more specific comparisons between MUAs, with intermediate (e.g., sex groups) and other units (e.g., rows) examined when germane. Although not included in the analysis presented in Chapters 4 and 5, where the number of mortuary variables explored was already rather large, the number of burials in a grave was

added to the list of independent variables as a means of expanding examination of this dataset, which is rather small both in terms of the number of analyzed mortuary characteristics as well as low prevalence and abundance rates. In some cases, the discussion concludes with presentation of some intangible aspects that are not particularly amenable to formalized treatment. Comparative material from other Kitoi cemeteries and, when relevant, from other Neolithic or Early Bronze Age mortuary traditions in the Cis-Baikal region is reviewed as well.

3. Use of Fire

Evidence for the use of fire in Kitoi graves at Shamanka comes in the form of charcoal stains (Ash Pits) of various size, shape, and saturation as well as, much less commonly, charring of human skeletal remains and grave inclusions (Fig. 6.3). Charcoal stains have been documented usually at the upper levels of grave pits and never in direct contact with burials. Consequently, charring of individual human skeletal elements (e.g., cranial fragments, vertebra, long bones, and phalanges) has been recorded only in three graves (Nos. 20, 25, and 62, with 5, 4, and 5 burials, respectively), while charring of unmodified animal bones as well as artifacts (organic and, in a few instances, inorganic) is more frequent (14 graves: Nos. 12, 20, 49, 55, 59, 62, 69, 70, 71, 81, 96, 88, 96, and 115). The affected organic objects are never fully calcined and the surrounding sediment never shows reddish discoloration. Consequently, the temperature of the fires burning inside these graves was probably relatively low. On the other hand, the duration was probably variable from short to long enough for charcoal stains to penetrate deep into the grave pits. Many Ash Pits are as shallow as a few centimeters but some are deeper and one is 0.34 m deep (Gr. 43).

Despite the high prevalence, the rather unsystematic variation in size, shape, and saturation and the minimal variation in location, do not lend Ash Pits to systematic quantitative analysis. Consequently, Ash Pits are analyzed essentially only in terms of their Presence or Absence in graves belonging to different units of analysis defined based on a few different independent variables (Table 6.4). To be sure, Ash Pits are also categorized as “Small” or “Large”, but such classification is of limited use because the horizontal size varies vertically (Jessup et al., 2024a). For example, what first appears as two small Ash Pits, lower in the grave may appear as one, or, obviously, the other way around. Unsurprising, analysis revealed no differential distribution worthy of report.

At Shamanka II, Ash Pits have been recorded in 32 of 97 graves (33%). Of the graves that could be assigned to phase, fires were most common in graves used in both phases (4 of 7, 57%), least common in graves built in Phase 2 (1 of 10, 10%), and Phase 1 graves are intermediate (24 of 72, 33%). Of the three large Phase 1 MUAs, in Group 2 (11 of 23, 48%) they are more common than in Group 1 (7 of 23, 30%) and Group 3 (6 of 18, 33%), while in the two small units (Groups 2–L and 4) they are absent.

In graves with only male burials, Ash Pits are about twice as prevalent (11 of 39, 28%) as in graves with females (2 of 14, 14%) or children only (3 of 19, 16%) and also twice as frequent in Row graves (25 of 62, 40%) as in Scattered graves (7 of 35, 20%). While they are absent in only three rows (A, J, and L), their row presence is quite variable: from 20% in Row C to 80% in Row H (4 of 5 graves). In the two rows with the unusual NE–SW orientation, their presence is dissimilar: they are documented in half of Row K graves (2 of 4, 50%) and not at all in Row L.

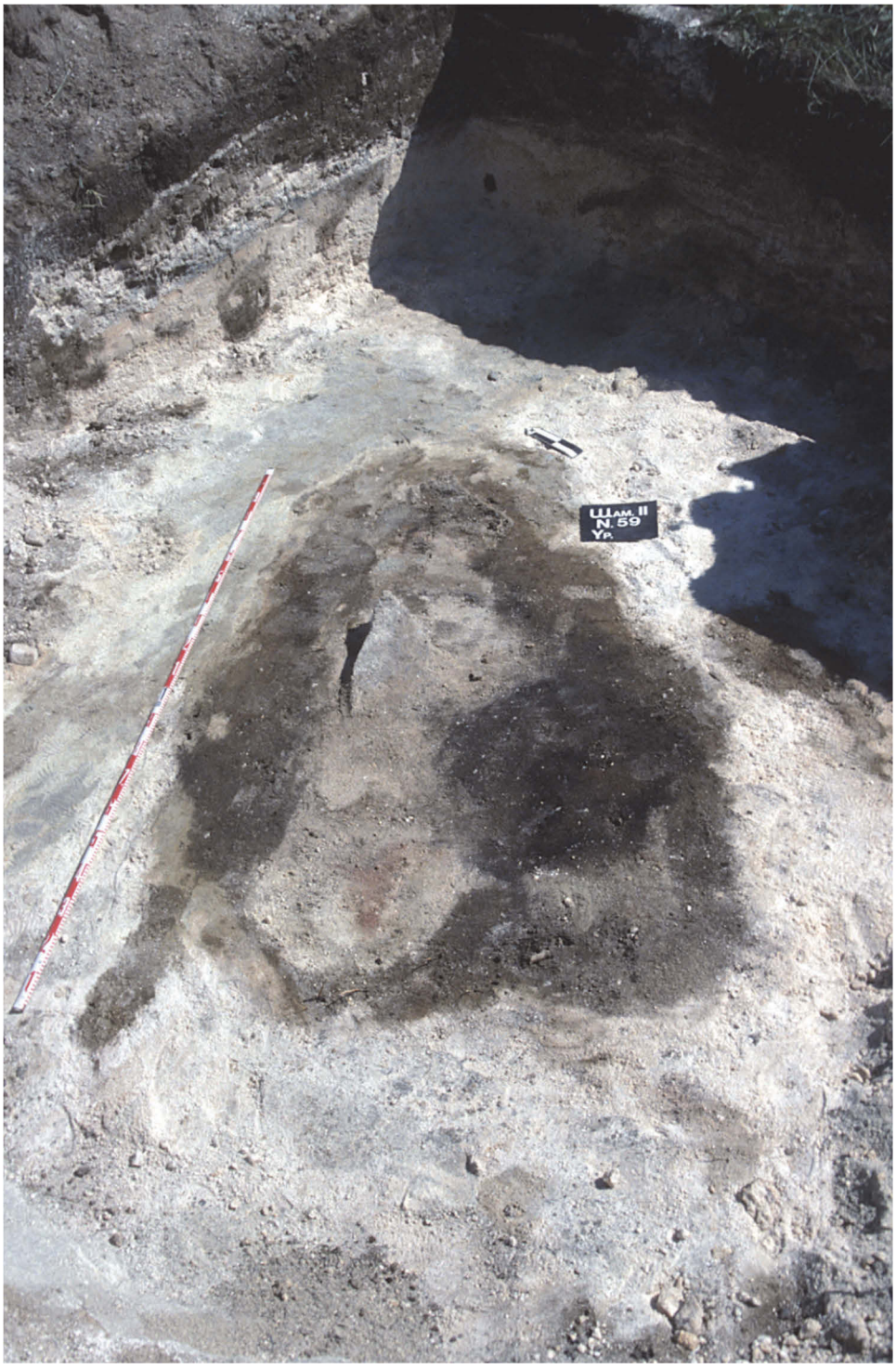


Figure 6.3. Shamanka II, Grave 59: Ash pit on surface. Figure by the BAP

Ash pits are a lot more common in Reopened (24 of 43, 56%) than in Intact graves (8 of 49, 16%) and 75% of all graves with Ash Pits are Reopened. Interestingly, the prevalence of Ash Pits covaries with the number of burials in a grave: they are the least common in graves with 1 burial (12 of 63, 19%), present in roughly half of the graves with 2–4 burials and in all 3 graves with 5 burials.

4. Zoomorphic Art

The assemblage of Zoomorphic Art at Shamanka II comes essentially in two forms only. One includes objects of various function (e.g., spoons, handles or ornaments) with finials shaped into animal heads such as moose or seal (Fig. 6.4). The other group includes effigies of moose heads only (Fig. 6.5), some of which appear to be pendants (Fig. 6.5.C and D) and others which may have been broken-off finials of larger objects. There are also zoomorphic engravings on needle cases and fragments of bone or antler objects of undetermined function; however, this kind of art is not examined here. Three lithic fish lures, known also from other Kitoi cemeteries such as Lokomotiv on the Angara (Bazaliiskii, 2010; Bazaliiskii, 2022; Okladnikov, 1974) and sometimes considered art objects, are excluded from this examination because they are part of the Fishing Gear examined in Chapter 5. Detailed grave descriptions (Bazaliiskii et al., 2024) and supplements to the full edition of this monograph (Jessup et al., 2024a; Jessup et al., 2024b) provide more information about this material.

Overall, only 14 items of Zoomorphic Art were found in 10 graves (10% of 97 graves) and out of 89 graves which could be positively assigned to phase, Zoomorphic Art is restricted to graves constructed during Phase 1 and this includes Phase 1 and Phase 1–Phase 2 graves (Table 6.4). However, since the number of Phase 2 graves is low (n = 10), this could be merely accidental because of the generally low prevalence and quantities of Zoomorphic Art at Shamanka II.

Comparison between the three large MUAs of Phase 1 doesn't reveal any particularly strong patterns either. True, graves with Zoomorphic Art appear to be more common in Group 2 (5, 22%) and quite rare in Groups 1 (1, 4%) and Group 3 (1, 6%; Table 6.3.A), but this is clearly driven by the much higher number of burials in Group 2 (Table 3.3). Limiting examination to graves with Zoomorphic Art present, it seems that the per burial metric in Group 3 is actually twice as high as in the other two groups, however, this is due to the four small moose head pendants in this group being found in a single grave with four burials (Gr. 78; Table 6.3.A; Jessup et al., 2024a).

Limiting the examination to graves with burials representing one sex category, Zoomorphic Art was found exclusively in Male graves (4), all single interments and all with one such item only. To be clear, no graves with Female(s) or Child(ren) only have Zoomorphic Art. While, based on this evidence, the association between Males and Zoomorphic Art appears to be relatively strong, it is weakened somewhat by the find of a small moose effigy in Grave 115, with a double interment of a Female and Young Child (1.5–2 years).[40] However, Grave 115 belongs to Row L (SE Cluster) and this particular grave, and the entire row, stand out from the other groups of graves at Shamanka II on a number of accounts (c.f., Chapter 5). The remaining five graves with burials of mixed sex and Zoomorphic Art each contain at least one Male interment.

[40] The skeletal sex of individual 115.01 has been determined as Probable Female; however, for the purpose of this study Probable Females and Females are grouped in one sex category of Females.

Figure 6.4. Shamanka II, Zoomorphic art: Functional and ornamental objects with finials shaped into animal heads. Figure by P. Kurzybov:

A. Grave 8
B. Grave 14
C. Grave 18
D. Grave 59
E. Grave 59
F. Grave 112

Zoomorphic Art is roughly equally common in Intact (4, 8%) as in Reopened (6, 14%) graves; of all graves with such items, 40% are Intact and 60% are Reopened. While not particularly informative on its own, this distribution is interesting because it suggests that objects of Zoomorphic Art were not preferentially removed from the disturbed graves.

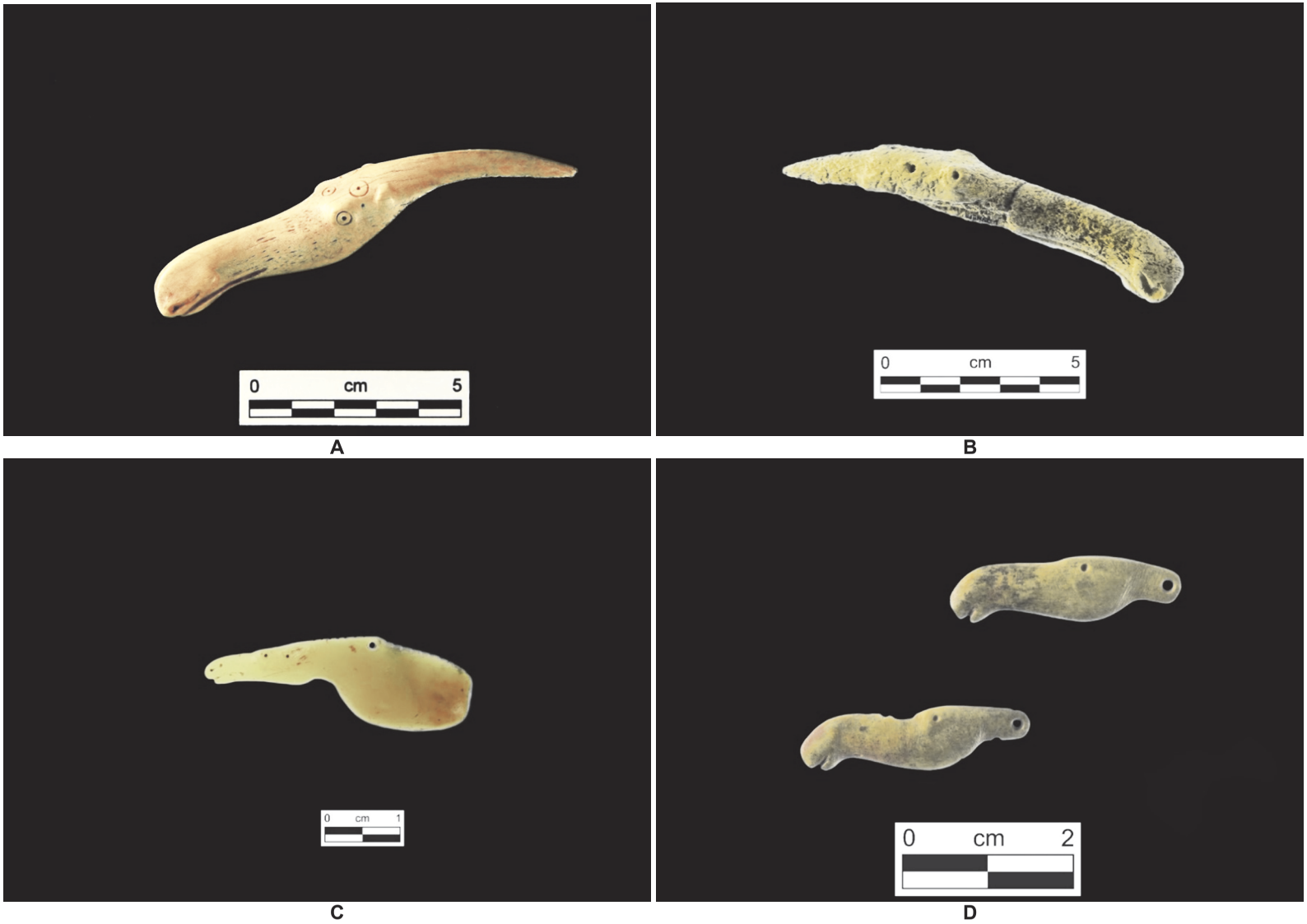


Figure 6.5. Shamanka II, Zoomorphic art: Moose-head effigies. Figure by P. Kurzybov:

A. Grave 15
B. Grave 62
C. Grave 78 (pendant)
D. Grave 78 (pendants)

Graves with Zoomorphic Art are about twice as common among Row graves (8 of 62, 13%) as among Scattered graves (2 of 35, 6%) and the distribution within both formations is also quite uneven. First, of the five Row graves with Zoomorphic Art that belong to Group 2, three are in Row H (including Grave 15 with one of the most abundant and diverse grave goods assemblages at Shamanka II) and one other grave is located in the neighbouring Row G. Two additional graves with Zoomorphic Art come from Row L (i.e., Group 2–L), a small unit of three graves with much richer grave goods than site average (c.f., Chapter 5). Moreover, of the two Scattered graves with Zoomorphic Art, one belongs to each the NW and SE Clusters. None of the 24 graves in the S Cluster (Row or Scattered) have Zoomorphic Art.

Thus, it seems that spatially the prevalence and abundance of Zoomorphic Art is highest among Phase 1 graves of the SE Cluster, particularly so in and around Row H. This differential distribution of Zoomorphic Art adds to the contrasts between Rows L and K (S Cluster), noted first in Chapter 5.

All other things being equal, one would expect the frequency and abundance of Zoomorphic Art to covary with the number of burials in a grave, that is, the more burials in the grave the higher the frequency and number of such items. This, however, is not the case at Shamanka II, even though graves with more than two burials account for 34% (53) of all burials. Only 2 graves out of 14 with 3–5 interments have Zoomorphic Art. Grave 78 (Reopened, Group 3) with 3 females and 1 male contained 4 moose head pendants and Grave 62 (also Reopened, Group 2, Row E) with 2 females, 2 males, and 1 unsexed adult contained 1 effigy of a moose head. The 8 remaining graves with Zoomorphic Art are single or double burials, together accounting for a total of 80% of all graves with such objects. However, Zoomorphic Art may be more common and abundant in graves with 2 burials (4 of 20, 20%; 5 items and 40 burials, 0.13/burial) than in graves with 1 individual (4 of 63, 6%; 4 items and 63 burials, 0.06/burial).

Similar Zoomorphic Art, in equally low numbers, is known from other Kitoi cemeteries in the Angara valley (Bazaliiskii, 2010; Losey at al., 2021). In particular, 6 moose heads carved in antler have been documented at Lokomotiv, 3 at Ust'-Belaia (Georgievskaia, 1989: 86), 1 at Kitoi, and 1 more, probably also from an EN grave on Ostrov Zhiloi on the Angara. Characteristically, all these moose head effigies were executed in almost exactly the same style (Losey at al., 2021). Moreover, a seal head (made of talc) was found at Lokomotiv (Okladnikov, 1974: 181) and the recently excavated, although entirely disturbed, cemetery at Moty-Novaia Shamanka on the lower Irkut River produced an antler bar with one end shaped into a bear head (Bazaliiskii et al., 2016).

5. Needle Cases

Although still relatively rare, Needle Cases are much more common than Zoomorphic Art and are known from graves of all four main Neolithic and Early Bronze Age mortuary traditions in Cis-Baikal (Kitoi, Isakovo, Serovo, and Glazkovo) and in all its archaeological micro-regions (Angara, Upper Lena, Little Sea, and SW Baikal; e.g., Bazaliiskii, 2010; Goriunova and Novikov, 2010; McKenzie, 2010). They are normally made of bird long bones and are frequently found with bone or metal (copper or bronze) needles still present inside. In the Shamanka II assemblage of grave goods they are represented by three variants: Plain, Decorated, and Feathered (Fig. 6.6). Diagonal or transverse lines, circles, or some other geometric motif engraved onto the surface define

the Decorated variant while Feathered Needle Cases were made by severing the tip of a swan wing at the proximal end of the carpometacarpus, leaving the phalanges attached with soft tissue, thus making it possible that the flight feathers were also left attached to the body of the needle case (Bazaliiskii et al., 2024).

A

B

Figure 6.6. Shamanka II, Needle cases. Figure A by P. Kurzybov; B by chapter authors:

A. Decorated needle cases with bone needles from Grave 25
B. Plain and decorated needle cases from Grave 108

In total, 50 Needle Cases were found in 17 (18%) out of 97 Kitoi graves at Shamanka II: 31 Plain, 12 Decorated, and 7 Feathered. Since the quantities of Decorated and Feathered specimens are rather low to discern any patterns all needle cases are analyzed first together and differential distribution of the three variants is addressed towards the end of the section.

Examination by Phase, by EN Disturbances, by MUAs, and by Formation revealed little systematic patterning (Table 6.4). Among the three large MUAs from Phase 1, the prevalence of graves with Needle Cases and their abundance in Group 3 (6 of 18 graves, 33%; and 17 of 50, 34%) are higher than in Group 1 (2 of 23 graves, 9%; and 3 of 50, 6%) and in Group 2 (3 of 23 graves, 13%; and 7 of 50, 14%). However, there are some differences between rows of graves, graves with different number of interments, and, most interestingly, between the sexes.

Considering all Needle Cases together, the prevalence of Female graves (5, 36%) with these items is almost three times as high as that of Male graves (5, 13%), and Needle Cases are entirely absent from the 19 Child graves. The lack of Needle Cases in Child graves permits adding graves of Females with Child(ren) and Males with Child(ren) to the examination and the pattern appears to hold: out of 4 such male graves none have Needle Cases while 1 of 2 such Female graves contained 6 (Gr. 115). That the number of Needle Cases (19) recorded in Male graves is almost three times higher than in Female graves (7) is, of course, the result of the imbalance between Male and Female graves and burials overall (Table 3.4) and between graves with single sex structure (14 Female graves with 19 burials vs. 39 Male graves with 48 burials). The quantities per burial in graves with Needle Cases present are about the same: 0.44/burial in Female and 0.40/burial in Male graves.

Obviously, while the number of Needle Cases (n = 24) recovered from Row graves is insufficient for this category to be present in each Row grave (n = 61), the number is high enough for each row of graves to have at least one or two. This, however, is not the case. Only 6 out of 13 rows have Needle Cases and the number of graves with Needle Cases per row is never higher than 2. Five of these rows (F, G, H, L, and M) are located in the SE Cluster and only one in the NW Cluster (Row C). No Needle Cases are found in the S Cluster (i.e., absent in both Row and Scattered graves there). Consequently, since Needle Cases are present in Row L, this adds yet another point of difference between Rows K and L. The highest concentration of Needle Cases is in Rows F, G, and H with a total of 11 specimens in 5 graves.

While Needle Cases appear to be equally common in graves with 1–2 burials (14 of 83, 17%) and in graves with 3–5 interments (3 of 14, 21%), the abundances are higher in the former. More specifically, there are 43 Needle Cases per 103 burials in graves with 1–2 burials (0.42/burial) and only 7 per 53 burials in graves with 3–5 individuals (0.13/burial). Interestingly, in graves with 2 individuals (8 of 20, 40%; 33 specimens with 40 burials, 0.83/burial), they are more prevalent and abundant than in graves with one interment (6 of 63, 10%; 10 specimens with 63 burials, 0.16/burial).

There may be additional differences in distribution between the three different kinds of Needle Cases. The main rationale behind this analysis is that if, indeed, the Feathered Needle Cases still had all the plumage attached to them they would be much larger than the Plain and Decorated ones. While Plain and Decorated Needle Cases could be, and probably were, carried around in tool kit pouches, as indicated by the instances where they were found within clusters of graves goods (e.g., Gr. 15 and 59; Bazaliiskii et al., 2024), the size and plumage of the Feathered ones suggests that they were rather carried around

separately, perhaps to be on display. Also, none of the Feathered specimens contained needles, while 9 of the Plain or Decorated cases had some (2 in Gr. 25, 3 in Gr. 59, 1 in Gr. 96, and 3 in Gr. 115). Since the prevalence rates and quantities are low the results of this analysis should be viewed with caution, however, they are still useful to present, if only to suggest a more nuanced examination in future.

Plain Needle Cases are equally prevalent in Phase 1 (9 of 72 graves, 13%) and in Phase 2 (1 of 10, 10%). Decorated Needle Cases are less common in Phase 1 (2 of 72, 3%) — though equally common in Group 2 of that phase (1 of 23, 4%) — and absent in Phase 2 (Group 5). Feathered Needle Cases, however, seem to be more common in Phase 2 (2 of 10, 20%) than in Phase 1 overall (3 of 72, 4%). Abundances of Plain and Decorated Needle Cases are higher in Phase 1 (24 and 6, respectively) than in Phase 2 (2 and 3, respectively) which makes sense because of the much higher number of Phase 1 graves and burials.

That Phase 1 and Phase 2 each have 3 Feathered Needle Cases despite the very uneven numbers of graves and burials attracts attention. This distribution seems similar to the distribution of Mass Ornaments which are also a lot more common and numerous in Phase 2 than in Phase 1 (c.f., Chapter 5). This suggests that, indeed, Feathered Needle Cases served more, or perhaps even only, as a display item than as a utilitarian object. That none of the Feathered Needle Cases contained needles inside perhaps lends additional support towards their nonutilitarian function. If so, it might be additionally meaningful that Feathered Needle Cases are not only found in association with both Female and Male burials but they appear to be more common and abundant in Female graves.

6. Bear remains

To date, the EN Kitoi component of Shamanka II is the only cemetery within the entire Middle Holocene Cis-Baikal where bear skeletal remains occurred in such abundance and elemental variation (c.f., Chapter 7). These materials come from two archaeological contexts: (1) the EN cultural layer documented across much of the site; and (2) the actual Kitoi grave pits. The faunal collection from the cultural layer is descriptively accounted for, though briefly, elsewhere (Bazaliiskii and Weber, 2024), while the animal remains collected from the graves, including bear, are examined in Chapter 7 employing methods of zooarchaeological analysis. Here, the focus is only on the mortuary context of bear remains listed in the detailed grave descriptions as part of the grave goods assemblages (Bazaliiskii et al., 2024). This material has been grouped into the following categories:

- Bear Bacula (BearBac) or *os penis*: with one exception, unmodified specimens (Fig. 6.7);
- Bear Crania (BearCran): complete or fragmented and their portions (Fig. 6.8);
- Bear Mandibles (BearMand): complete, halves, or fragmented;
- Bear Teeth (BearTeeth): loose teeth not embedded in lower or upper jaws; and
- All Bear skeletal remains (BearAll): all four categories together plus two additional, and rare, objects — a phalanx (Gr. 23) and an implement made of bear radius (Gr. 64).

As mentioned earlier, these groups of bear skeletal remains are measured on the nominal scale as Present or Absent and on the ratio scale as specimen counts. Their vertical location within a grave is measured by one additional nominal variable.

Figure 6.7. Shamanka II, Grave 21: Bear bacula. Figure by P. Kurzybov

Figure 6.8. Shamanka II, Grave 22: Bear cranium. Figure by the BAP

Although descriptive statistics (Table 6.2) and original data (Jessup et al., 2024a) are presented for all five categories, and additional quantitative metrics (Table 6.3) are presented for four, the analysis is limited to three. Examination of the BearAll category provides a general overview of the archaeological context inside Kitoi graves at Shamanka II, while an assessment of Bacula and Crania highlights two more specific aspects of this matter. Mandibles and Teeth are omitted from this analysis because the preliminary evaluation of the results demonstrates that they reveal the same insights as Crania or BearAll skeletal remains.

Overall, 96 specimens of bear skeletal remains were recorded inside the Kitoi graves at Shamanka II, including 16 Bacula and 15 Crania, both showing similar descriptive statistics and other quantitative metrics (Table 6.2; Table 6.3; Table 6.4).[41] The main difference is that Bacula tend to come from single interment graves while Crania clearly associate with multiple burial graves. The following analysis reveals several additional differences.

While no clear differences are visible between the phases analyzed as two separate aggregates, the distributions between Phase 1 MUAs are rather different. Relative to the site average (32 of 97, 33%), BearAll are equally more common in graves of Group 2 (9 of 23, 39%) and Group 3 (7 of 18, 39%) and less common in Group 1 (3 of 23, 13%). The small Group 2–L (2 of 3, 67%) shows the highest rates.

Of the three large Phase 1 MUAs, Bacula in graves of Group 2 (2 of 23, 9%) and Group 3 (2 of 18, 11%) are about equally prevalent and close to the site average (8 of 97, 8%). Bacula are absent in Group 1. Crania, however, show a different distribution: relative to the site average (12 of 97, 12%), they are most common in Group 2 (5 of 23, 22%) and least common in Group 1 (1 of 23, 4%). Group 3 (2 of 18, 11%) is close to the site average and so is Group 5 (i.e., Phase 2, 1 of 10, 10%). Interestingly, Bear Crania are absent in Group 2–L although Bacula feature in 2 of its 3 graves.

Examination of BearAll by Sex, shows that they occur in graves of all three single sex grave groups (17 of 72, 24%), however, they may be somewhat more common in graves of Males (11 of 39, 28%) than in Female (3 of 14, 21%) or Child graves (3 of 19, 16%). In other words, 65% (11 of 17) of graves with bear remains are Male, which is somewhat higher than the percentage of Male graves (39, 54%) among the single sex graves. The distributions of Bacula and Crania, analyzed separately, are different again. Bear Bacula, found in 6 (8%) of 72 graves with single sex burials come mostly from Male graves (5 of 39, 13%), are absent in Female graves, and present in only 1 Child grave (1 of 19, 5%). The baculum in Grave 28 with the Young Child (1.5–3.0 years old) was shaped into a point whereas all other specimens were unmodified and its cultural significance, thus, could be different (c.f., Chapter 7). So, 83% of all graves with Bacula are Male even though only 54% (39) of single sex graves are Male. In contrast, the distribution of Crania (5 of 72, 7%) is similar to the distribution of BearAll: present in 1 (5%) Child, 1 (7%) Female, and 3 (8%) Male graves. Thus, 60% (3) of all graves with Bear Crania are Male, which is close to the proportion of such graves in the analyzed group (39, 54%).

Regarding the EN grave disturbances, the differences are most obvious when presentation is limited to Bacula and Crania.[42] Relative to the site average (8 of 97, 8%), Bacula are more common in Intact (6 of 49, 12%) than in Reopened (2 of 43, 5%) graves. Or, 75% of all graves with Bacula are Intact and 25% are Reopened. Crania (site average: 12 of 97, 12 %), on the other hand, are less common in Intact (4 of 49, 8%) than in Reopened (8 of 43, 19%) graves. Or, 33% of all graves with Bear Crania are Intact and 67% are Reopened.

[41] The abundances analyzed in this chapter may differ from the quantities presented in Chapter 7. This is because the quantities compiled in this chapter are based on catalogue numbers assigned in the field and later organized for presentation in grave descriptions. On the other hand, the quantities analyzed in Chapter 7 are based on the number of specimens observed in the laboratory at the time when zooarchaeological analysis was carried out a few years after excavations at Shamanka II were completed. Additionally, Chapter 7 sometimes includes specimens from the grave surface and, occasionally, the cultural layer above the grave.

[42] For the record, BearAll are less common in Intact (14 of 49, 29%) than in Reopened (18 of 43, 42%) graves. Or, 44% of all graves with BearAll are Intact and 56% are Reopened.

BearAll and Bear Crania seem to be equally common among Row graves (19 of 62, 31% and 8 of 62, 13%, respectively) as among Scattered graves (13 of 35, 37% and 4 of 35, 11%, respectively) but Bacula may be more prevalent among Scattered (4 of 35, 11%) than in Row graves (4 of 62, 6%). In other words, among the rows, graves with Bear Crania are twice as common as graves with Bacula, while among Scattered graves they are equally common. Distribution among the rows is also uneven. The overall prevalence of BearAll among Row graves is 31% (19 of 62), but three rows (C, D, and I) have no bear remains and otherwise the prevalence varies from 17 to 67% with Row F (6 of 9, 67%), H (3 of 5, 60%), and Row L (2 of 3, 67%) showing the highest ratios. Of the 8 Row graves with Bear Crania, 7 come from Rows E, F, G, and H in the SE Cluster, one from Row A in the NW Cluster, and none from the rows of the S Cluster. Because of the low prevalence rates, there are some rows with neither Bear Bacula nor Crania and the rows that do have them never have more than two graves with these items. Lastly, although both Rows K and L have graves with bear skeletal remains, Row K has neither Bacula nor Crania, while Row L has one grave with Bacula.

It is also informative to examine Bear Bacula and Crania with regard to their vertical location within a grave categorized as: Burial Level, Grave Pit Fill, or Both (i.e., found at both levels). Since sample sizes are small, the matter is assessed mainly at the scale of the entire cemetery. While Bacula are most commonly documented at the Burial Level (5 of 8, 63%), there are also a few instances of Bacula found within the Grave Pit Fill (1) and at Both levels (2). In contrast, of 12 graves with Bear Crania, in 10 (83%) they come from the Grave Pit Fill and only 1 each from the Burial Level and Both levels.

Additional differences between the distribution of Bear Bacula and Crania regard the number of burials in a grave, which at Shamanka II vary from 1 to 5 (Table 4.3). The presence of Bacula in graves essentially covaries with the frequency of graves in each category of burials per grave. For example, there are 63 (of 97, 65%) graves with 1 burial and 5 (of 8, 63%) graves with Bacula have 1 burial in them; likewise, the only grave category without Bacula is graves with 5 burials, of which there are only 3 at Shamanka II. But the distribution of Crania is different. They are substantially underrepresented in graves with 1 burial (3 of 12, 25% vs. 63 of 97, 65%) and much overrepresented in graves with 2 burials (7 of 12, 58% vs. 20 of 97, 21%), absent in graves with 3–4 burials, and even more overrepresented in graves with 5 burials (2 of 12, 17% vs. 3 of 97, 3%). Since the prevalence rates are generally low, association patterns between graves with 3–5 burials, Bacula, and Crania might be spurious. However, the differences the Bacula and Crania show with regard to their presence in graves with 1 and 2 burials probably merit attention.

The last aspect of variation in the distribution of bear remains to examine in this chapter is the use of fire. Although both Bacula and Crania occur in graves with and without Ash Pits, Bacula appear to be more common in graves without Ash Pits (6 of 8, 75%), while Crania seem to be more prevalent in graves with Ash Pits (8 of 12, 67%). Interestingly, charring of bear skeletal remains is rare and was observed only in 3 graves (Nos. 12, 20, and 50) and only on some elements (Gr. 12 mandible, Gr. 20 cranium, and Gr. 59 cranial fragments).

There are a few other aspects of bear skeletal remains that could also be examined but they have been omitted for two reasons. First is the same reason for which Bear Mandibles and Bear Teeth were excluded: namely, it is unlikely that they would reveal any new insights in addition to those already provided by the categories analyzed above. Second, the small number of cases where these characteristics are observable makes

pattern detection very doubtful. These aspects include the orientation of Bear Crania (cranial vault up, etc.) and their position relative to the cardinal directions, grave axis, or Ash Pits (on top, below or within). Still, this information is available for the interested reader in the detailed grave descriptions (Bazaliiskii et al., 2024).

7. Foreign Human Bones

In several instances, some stray human skeletal elements were determined not to belong to the principal interment(s) in a grave. These cases have been labelled as Foreign Human Bones. Grave 108 illustrates this matter very well. The grave contained two individuals arranged on two levels separated by a layer of sediment (Fig. 6.9; Bazaliiskii et al., 2024). This intervening layer (about 50 cm thick) contained some archaeological material including a scatter of human skeletal elements which were identified already at the time of excavation. From top to bottom, these skeletal remains were designated as Burials 108.01, 108.02, and 108.03. Both the upper and bottom skeletons were sufficiently articulated and complete to be designated as extended supine (c.f., Bazaliiskii et al., 2024). All three burials were subsequently dated by radiocarbon showing that the upper and bottom interments belonged to Phase 2, while Burial 108.02 (the scatter of bones from the intervening layer) dated to Phase 1 (Weber et al., 2016a). Clearly, the few elements representing Burial 108.02 entered the grave accidentally either when it was first excavated for Burial 108.03 and backfilled with whatever objects were part of the matrix "shoveled" back into the pit or at the time when it was later reopened to add Burial 108.01 to the grave.[43]

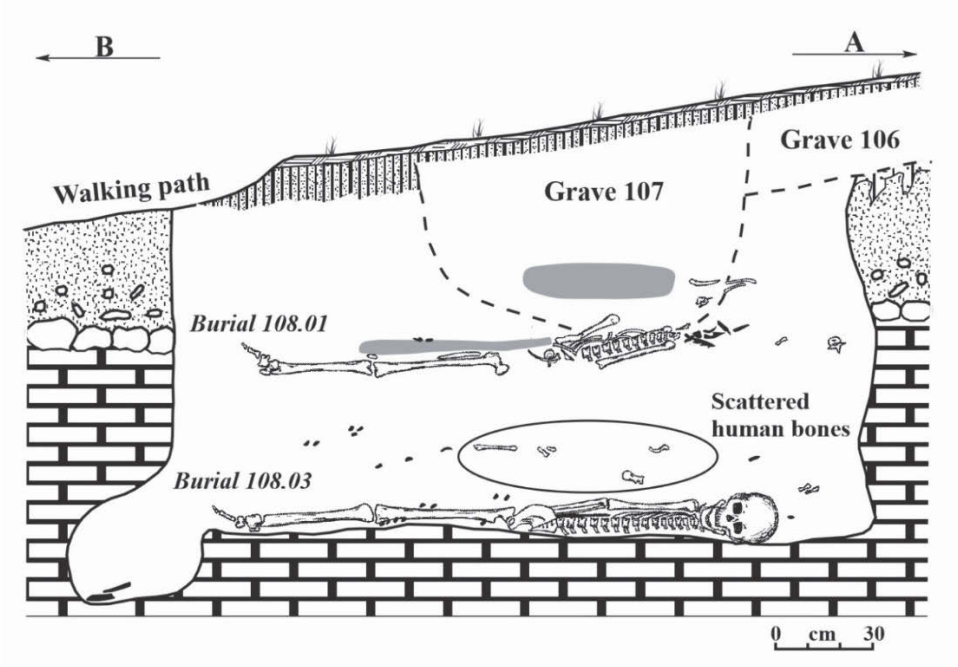


Figure 6.9. Shamanka II, Grave 108: Longitudinal-section showing two burials (108.01 and 108.03) separated by a layer of sediment containing foreign human bones. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii

[43] Although the radiocarbon dates for these two burials are essentially identical (Chapter 2; Supplements 2 and 3), the layer of sediment suggests the passage of time between the two burial events.

This is also consistent with the fact that an EN cultural layer (c.f., Bazaliiskii and Weber, 2024) has been documented across much of the cemetery, with the highest discard rates in the area of the SE Cluster. That many graves were reopened at least once, and thus also backfilled more than once, after the original interment had two evident consequences: (1) human skeletal remains were removed, accidentally or deliberately, from the graves, thus becoming part of the cultural layer along with the other categories of archaeological material; and (2) some of these stray human bones and other archaeological material were "shovelled", accidentally or deliberately, back into reopened or new graves. Even though it seems more likely that all instances of Foreign Human Bones present in Kitoi graves at Shamanka II are accidental rather than deliberate, it is still useful to examine this material as systematically as the small dataset allows. Unlike the other mortuary aspects analyzed in this chapter, Foreign Human Bones are measured only on the nominal scale as Present or Absent, however, additional details regarding these skeletal elements are provided elsewhere (Bazaliiskii et al., 2024).

At Shamanka II, Foreign Human Bones have been documented in 18 (of 97, 19%) Kitoi graves.[44] Among graves positively assigned to a phase, graves with such elements appear to be twice as common in Phase 2 (3 of 10, 30%) as in Phase 1 (11 of 72, 15%). Of the 7 graves used in both phases, 3 graves (43%) also had Foreign Human Bones. Graves with Foreign Human Bones are present in the three largest Phase 1 MUAs but the prevalence rates are somewhat different: Group 1 (4 of 23, 17%) and Group 3 (2 of 18, 11%) are about the same and close to the site average (18 of 97, 19%) while Group 2 (5 of 23, 22%) is a little higher. During Phase 1, Foreign Human Bones are absent only in the two small MUAs: Group 2–L and Group 4. Phase 2 Group 5 (3, 30%) is the highest overall even though the unit is relatively small.

While Foreign Human Bones may also be more common among Row (13 of 62, 21%) than among Scattered graves (5 of 35, 14%), their distribution between the rows is clearly uneven. Two of the three rows (Rows I and J) of the S Cluster (n = 13 graves) have them and the one that does not is Row K with the rare NE–SW orientation, they were recorded in half (Rows B and C) of the 4 rows of the NW Cluster (n = 16 graves), and in 5 (Rows E, F, G, H, and M) of the 6 rows of the SE Cluster (n = 33 graves). In the SE Cluster, Foreign Human Bones are absent only in Row L. The highest spatial concentration of Foreign Human Bones occurs among the neighbouring Rows E, F, G, and H, where they were found in 6 (22%) of the 27 graves: each row having at least 1 such grave and Row H having 3. With no Foreign Human Bones, Rows K and L are similar in this regard.

Foreign Human Bones are absent in Child graves and appear to be a little more common among Female (4 of 14, 29%) than Male (8 of 39, 21%) graves. No clear differences in the distribution of Foreign Human Bones were found with regards to Intact (9 of 49, 18%) vs. Reopened (9 of 43, 21%) graves or relative to the number of burials in a grave. However, Foreign Human Bones may be a little more common in graves with 3–5 burials (4 of 14, 29%) than in graves with 1–2 interments (14 of 83, 17%).

There might be also some differences in vertical distribution within graves. Overall, they are found at both levels but more commonly within the Grave Pit Fill (9 of 18, 50%) than at the Burial Level (6 of 18, 33%). However, the vertical location by phase may be different. Among Phase 1 graves they are equally common at the Burial (5, 45%) and Grave Pit Fill levels (5, 45%) while in Phase 2 all 3 instances come from the Grave Pit Fill.

[44] Routine review of all materials and data presented in the GAI Monograph in preparation for the ISU monograph revealed the presence of stray human bones in three additional graves: Reopened Graves 26 and 42 and Intact Grave 29, all located in the S Cluster. Consequently, the abundances and prevalence rates presented in this section, Fig. 6.2, and Table 6.4 are slightly different from those presented in the previous examination (Weber et al., 2024: Fig. 10.405, Table 10.59). Since these differences are minor, they have no impact on general findings and conclusions.

The last aspect to assess is the association between Foreign Human Bones and the use of fire inside graves. Of all graves assigned to a single phase, Foreign Human Bones come from graves with and without Ash Pits. However, during Phase 1, only 10% (5 of 48) of graves without Ash Pits have Foreign Human Bones while they are present in 21% (5 of 24) of graves with Ash Pits. With three graves containing Foreign Human Bones, Phase 2 is too small to analyze, however, its only grave with an Ash Pit also had stray human elements.

8. Summary

To summarize the analysis of mortuary variation presented in this chapter requires paying due attention to the following points: (1) the highly variable size of the main units of comparison (e.g., phases, MUAs etc.); (2) the frequently very low prevalence rates; and (3) the generally small quantities of items in most of the analyzed categories. While these factors somewhat limit the findings, it does not follow that culturally meaningful patterns in this material do not exist or that they cannot be detected through this analysis. It is practical, however, whenever possible, to narrow this review to units of analysis of roughly similar size and to assess the prevalence rates of all categories together rather than individually. To facilitate the latter, all prevalence rates evaluated in this summary have been collated in Table 6.4.[45] Nonetheless, in a few instances, it is still useful to examine some of these categories separately. One additional introductory note regards Bear Bacula, which — the analysis suggests — should be considered on its own terms and separately from the other categories of bear skeletal remains (c.f., Chapter 7). These Bacula were probably worn for display, perhaps to signify the status, role or achievement (i.e., social personae) of the deceased. The same probably applies also to Feathered Needle Cases.

The two phases of cemetery use show, as expected, many similarities but also a few differences, such as the much higher incidence of graves with Ash Pits in Phase 1 as well as the higher prevalence of graves with Feathered Needle Cases, Bear Bacula, and Foreign Human Bones in Phase 2. That Zoomorphic Art is absent in Phase 2 graves is probably an effect of the small sample size combined with the general rarity of these objects. Feathered variants are the only category of Needle Cases that appear to be more common in Phase 2 graves, suggesting that their function, as mentioned, was perhaps not utilitarian only but also (if not mainly) for display. Bear Bacula fit this pattern as well. This would be consistent with the conclusion from the analysis in Chapter 5 suggesting that Phase 2 people used items of personal adornment for display in much larger numbers than those from Phase 1.

That more graves from Phase 2 have Foreign Human Bones may simply be related to the fact that there was probably a relatively larger number of them scattered around the surface of the cemetery at that time, since a large number of graves had already been disturbed during Phase 1 (38 of 73, 39%; Table 4.2). The very haphazard nature of the variation displayed by the other distributions of Foreign Human Bones strongly suggests that their presence in Kitoi graves at Shamanka II is more likely accidental than deliberate and, therefore, this category is omitted from the remainder of this summary.

[45] The mortuary variables examined in Chapter 5 are not summarized in the same way because they are measured differently, i.e., on the nominal scale with multiple values and on the ratio scale. Therefore, for comparison, it is necessary to consult relevant tables from Chapter 5 (e.g., 5.1–5.11).

Table 6.4. Summary of the Presence and Absence analysis for Ash Pits, Zoomorphic Art, Needle Cases, Bear Remains, and Foreign Human Bones in various units of analysis. Note: "0" values have been removed

Unit of analysis	AshPits	ZooArt	NCAll	NCPlain	NCDec	NCFeathered	BearAll	BearBac	BearCran	ForHumBones	Unit [n]
Cemetery	33%	10%	18%	12%	5%	6%	33%	8%	12%	19%	97
Phase 1	33%	13%	17%	13%	3%	4%	31%	8%	11%	15%	72
Phase 1–Phase 2	57%	14%	14%	14%	14%	14%	43%	–	29%	43%	7
Phase 2	10%	–	20%	10%	–	20%	40%	20%	10%	30%	10
Group 1	30%	4%	9%	4%	–	9%	13%	–	4%	17%	23
Group 2	48%	22%	13%	4%	4%	4%	39%	9%	22%	22%	23
Group 2–L	–	67%	33%	33%	33%	–	67%	33%	–	–	3
Group 3	33%	6%	33%	33%	–	–	39%	11%	11%	11%	18
Group 4	–	–	–	–	–	–	20%	20%	–	–	5
Group 5	10%	–	20%	10%	–	20%	40%	20%	10%	30%	10
Child graves	16%	–	–	–	–	–	16%	5%	5%	–	19
Female graves	14%	–	36%	21%	7%	14%	21%	–	7%	36%	14
Male graves	28%	10%	13%	10%	–	5%	28%	13%	8%	23%	39
Intact graves	16%	8%	18%	14%	4%	6%	29%	12%	8%	18%	49
Reopened graves	56%	14%	19%	12%	7%	7%	42%	5%	19%	21%	43
Row graves	40%	13%	15%	8%	6%	6%	31%	6%	13%	21%	62
Scattered graves	20%	6%	23%	20%	3%	6%	37%	11%	11%	14%	35
Row K	50%	–	–	–	–	–	25%	–	25%	–	4
Row L	–	67%	33%	33%	33%	–	67%	33%	–	–	3

Among the three large Phase 1 MUAs, the prevalence rates in Group 1 are generally very low across all categories, much lower than in the other two units and particularly so relative to Group 2 (Table 6.4). There are also a few more specific differences. Graves with Zoomorphic Art and Bear Crania are much less common and Bear Bacula are absent in Group 1, while graves with Zoomorphic Art and Bear Crania are most frequent in Group 2.

The next few comparisons regard units of analysis that combine both phases of cemetery use and, as such, they have a more general chronological dimension. Distributions by burial Sex show a few notable patterns. Child graves lack entirely Zoomorphic Art, Needle Cases, and unmodified Bear Bacula (i.e., excepting the single baculum from Child Grave 28 which was shaped into a point). Female and Male graves have similar overall prevalence rates but they nevertheless differ in a few details. Female graves lack Zoomorphic Art and Bear Bacula but graves with Needle Cases — all variants together and separately — are more common, while Ash Pits, occurring in all three groups, are more common among Male graves. Zoomorphic Art and Bear Bacula, absent in both Child and Female graves seem to be restricted to Male graves. Thus, if both Feathered Needle Cases and Bear Bacula were used for display to signify a social persona of the deceased, these two objects very likely signified two different personae: one signified by Bear Bacula and restricted to Males (Gr. 21, 22, 28, 30, 45, and 112), and one signified by Feathered Needle Cases that was accessible to both Females and Males (Gr. 8, 96, 104, and 108). Interestingly, these two objects never occur in the same grave.

Examination by EN Grave Disturbances and Formation also shows a few discernible differences. Although the overall prevalence rates are similar between the relevant units of analysis and also close to site averages (Table 6.4), Reopened and Row graves show higher prevalence rates of Ash Pits compared to Intact and Scattered graves. Only a few of the remaining variables show noteworthy contrasts. Graves with Zoomorphic Art appear to be more common among Reopened graves while, conversely, graves with Bear Bacula are more common in Intact graves. Moreover, graves with Zoomorphic Art appear to be more common among Row graves while graves with Bear Bacula are more common in Scattered graves. Also, the spatially compact group of Rows E, F, G, and H shows high prevalence of graves with Zoomorphic Art, Needle Cases, and Bear Crania.

This analysis further underscores the differences, already demonstrated in Chapter 5, between Rows K and L which share an orientation (different from the other 11 rows), but neither a location (as they are situated at the opposite ends of the cemetery) nor a chronology — Row K is older than Row L although both belong to Phase 1 (c.f., Chapter 2). Not only are the overall prevalence rates for Row K much lower than for Row L, but several categories are entirely absent (i.e., Zoomorphic Art, Needle Cases of all variants, Bear Bacula and Crania). The Ash Pits, however, are present in two of the four Row K graves while absent in Row L. The low prevalence rates in Row K resemble those of Group 1, Group 4, and Child graves, while prevalence rates for Row L are not only high but much higher than for next highest unit (i.e., Group 2; Table 6.4).

Assessment of the number of burials in a grave and the vertical location of Ash Pits within graves reveals additional patterns. Ash Pits are more common in graves with 3–5 burials but Zoomorphic Art is more frequent in graves with 1–2 interments. Needle Cases are more prevalent and abundant in graves with two individuals than in graves with one interment. Bear Crania also seem to be more common in graves with two burials than with one and not a single Feathered Needle Case came from a grave with more than two burials. Interestingly, the distribution of Bear Bacula shows no bias towards any specific number

of interments in a grave. Location within a grave further separates Bear Bacula from Bear Crania: the former come mostly from the Burial Level, the latter mostly from the Grave Pit Fill. Association with Ash Pits adds another dimension of difference: the Bacula come mostly from graves without Ash Pits, while the Crania are more prevalent among graves with Ash Pits.

In sum then, the most general and perhaps important picture emerging from the examination of this set of mortuary characteristics is that of continuity and similarity between essentially all units of analysis (Table 6.4). For example, among the four larger units of analysis ($n \geq 10$), Ash Pits and Bear Crania (the mortuary variables related to postmortem activities) are present in Female, Male, and Child graves. Furthermore, the variables considered grave goods are absent only in the following units of analysis:

- Zoomorphic Art is absent in three units: Phase 2 (Group 5), Child, and Female graves;
- Needle Cases (Plain or Decorated) are absent only in Child graves;
- Feathered Needle Cases are absent in Group 3 and Child graves; and
- Unmodified Bear Bacula are absent in Group 1, Child, and Female graves.

Since many of the samples are rather small, the prevalence rates frequently low, and the main pattern regards differences of degree rather than Presence vs. Absence, it will not be surprising if the systematic examination of other Kitoi cemeteries overwrites the differences examined in this chapter regarding the Presence or Absence of a mortuary characteristic in favour of differences of degree. Still, regardless of the nature of the identified differences, they all likely carry important cultural connotations that are worth further reflection.

Chapter 7. Variation in the distribution of faunal remains

Andrzej W. Weber, Erin Jessup, Vladimir I. Bazaliiskii, Robert J. Losey

1. Introduction

This chapter analyzes the faunal remains recovered from Early Neolithic graves at the Shamanka II cemetery. The examination is divided into two parts. In Part 1 the focus is on identification of the entire faunal assemblage, its structure (by species or genus), and, when applicable and practical, the archaeological context within particular graves. Part 2 examines the distribution of these faunal remains in the manner similar to the one employed in the analysis of grave goods (Chapter 5) and a few idiosyncratic aspects of the mortuary ritual documented at Shamanka II such as use of fire, presence of bear skeletal remains, and stray human bones as well as some relatively rare grave goods such as zoomorphic art and needle cases (Chapter 6). The two approaches differ from one another and are presented in the opening sections to each part.

2. Part 1. Taxonomic structure: Approach

Taxonomic identifications for graves excavated between 1998 and 2008 (n = 95) were made by R.J. Losey and L. Fleming between 2009 and 2011 using a comparative faunal collection in Irkutsk and various osteological manuals and photographs. Some specimens, particularly those from birds, were identified using the collections of the Smithsonian Institution's National Museum of Natural History. Notes on the faunal remains from the non-grave context at the site (i.e., from the 'cultural layer') can be found in Bazaliiskii and Weber, 2024. Specimens in this chapter are primarily quantified using NISP (following Lyman, 2008). Note, however, that the numbers presented here may differ from those in the grave descriptions (Bazaliiskii et al., 2024), as NISP values were calculated based on the number of specimens observed in the laboratory, regardless of whether they were considered grave goods and given catalog numbers by the excavators. Also employed here are ubiquity measures, which are calculations of the percentage of Early Neolithic graves at the site containing remains from a given taxon. Data in tables are ordered by evolutionary taxonomy.

The total faunal assemblage, including modified and unmodified objects, consists of 5698 specimens, excluding the whole burial of a dog in Grave 26.[46] Within this assemblage were 4930 specimens from mammals, 451 from birds, 97 from fish, 65 from invertebrates, and 155 undifferentiated osseous items (Fig. 7.1). Faunal remains from Graves 115 and 116 (excavated in 2019) are not included in Part 1 of this chapter because due to COVID and political travel restrictions they could not be examined in the same fashion as the rest of the faunal assemblage.[47] The main units of analysis are twofold: the cemetery as a whole (i.e., the 95 graves excavated between 1998 and 2008) and individual graves as needed. Other units of analysis are employed in Part 2.

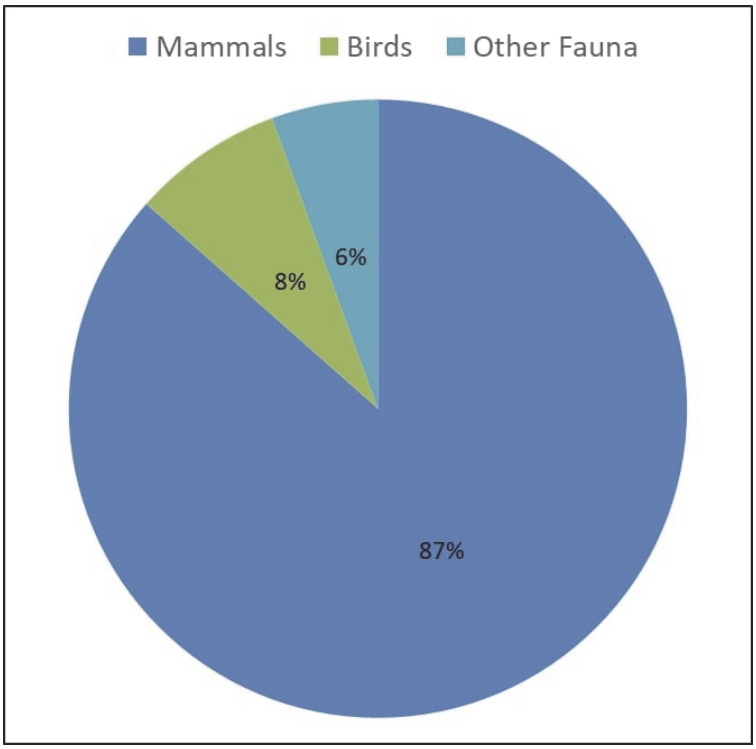


Figure 7.1. Shamanka II, Proportions of faunal assemblage (n=5698) represented by Mammal, Bird, and Other Faunal specimens. Figure by chapter authors

2.1. Mammal remains

Mammal specimens from Shamanka are summarized in Table 7.1. Note that 1046 specimens (21.2% of the assemblage) were only identified to the categories of mammal or large mammal, while 3884 specimens (78.8% of the assemblage) were identified to more specific categories, indicating that the remains are very well preserved. A few taxa constitute the bulk of the mammal assemblage, with deer (Cervidae), Siberian marmot (*Marmota sibirica*), brown bear (*Ursus arctos*), sable (*Martes zibellina*), hare (*Lepus* spp.), and mammoth (*Mammathus* sp.) all being represented by 100 specimens or more. Note that mammoth remains are over-emphasized in these calculations, as they are represented by very highly fragmented ivory implements. In terms of ubiquity (number of graves with such items), these same taxa (excluding mammoth) are all present in 10% or more of the graves at Shamanka. The mammal remains are discussed in the order presented in Table 7.1.

[46] Distributions of some of the modified objects, such as shafts of composite tools, arrowheads, boar tusk and red deer canine pendants, and bone pendants, are examined in more detail in Chapter 5.
[47] These faunal remains were identified by V.I. Bazaliiskii and are included in Part 2 of this chapter.

Table 7.1. Summary of mammal specimens from Shamanka II

Taxon	Common name	NISP	# Graves	Ubiquity %
Mammathus sp.	Mammoth	187	6	6.1
Rodentia	Rodents	25	5	5.1
Marmota sibirica	Siberian marmot	1533	46	46.9
Castor fiber	Eurasian beaver	10	6	6.1
Urocitellus undulatus	Long-tailed ground squirrel	12	2	2.0
Lepus spp.	Hare	115	12	12.2
c.f. *Lepus*	c.f. hare	1	1	1.0
Carnivora	Carnivore	7	4	4.1
Lynx lynx	Eurasian lynx	1	1	1.0
Canis spp.	Dog or wolf	16	4	4.1
Vulpes vulpes	Red fox	2	2	2.0
c.f. *Vulpes vulpes*	c.f. red fox	1	1	1.0
Ursus arctos	Brown bear	184	34	34.7
c.f. *Ursus arctos*	c.f. brown bear	122	7	7.1
Phoca sibirica	Baikal seal	20	7	7.1
Lutra lutra	European otter	1	1	1.0
Mustela sp.	Weasel	2	1	1.0
Martes zibellina	Sable	142	23	23.5
Artiodactyla-large	Large even-toed ungulates	2	2	2.0
Artiodactyla-small	Small even-toed ungulates	2	2	2.0
Sus scrofa	Wild boar	57	24	24.5
Moschus moschiferus	Musk deer	67	17	17.3
Cervidae	Deer family	332	45	45.9
c.f. Cervidae	c.f. deer	50	13	13.3
Cervidae-large	Elk or red deer	428	49	50.0
Cervidae-small	Roe deer or reindeer	4	3	3.1
Alces alces	Elk	61	2	2.0
c.f. *Alces alces*	c.f. elk	1	1	1.0
Capreolus pygargus	Siberian roe deer	132	18	18.4
c.f. *Capreolus*	c.f. Siberian roe deer	17	12	12.2
Cervus elaphus	Red deer	342	22	22.4
c.f. *Cervus elaphus*	c.f. red deer	8	5	5.1
Mammal	Undifferentiated mammal	737	53	54.1
Mammal-large	Large mammal	309	50	51.0
Total		4930		

Elephantidae

Remains identified as being from mammoth (*Mammuthus* sp.) include 138 ivory specimens from 6 graves (Nos. 8, 15, 18, 20, 63, and 78). These appear to represent as few as six implements, perhaps all insert tools. All but one of the six graves with mammoth implements were badly disturbed and the original placement of the items could not be determined. Grave 63 is the exception, and the mammoth tusk fragments in this grave were found in the hip area of Burial 63.01. Item No. 97 in Grave 15 is perhaps the best example of a shaft of intact composite ivory insert tool in the site (Fig. 7.2). Given that mammoth were already longtime extinct in Cis-Baikal during the Holocene, these implements most likely were made from fossil ivory.

Figure 7.2. Shamanka II, Grave 15: Shaft of a Composite tool (weapon) made of mammoth ivory. Figure by P. Kurzybov

Rodentia

Remains identified only to the Rodentia order include 25 specimens from 5 graves (Nos. 11, 39, 59, 71, and 104). These include cranial and postcranial remains, all unmodified, from mouse-sized species. They may be intrusive and not actual grave inclusions, with one possible exception. In Grave 39, 14 post-cranial elements and fragments from a mouse-sized juvenile rodent were found near the pelvis of a human burial. This burial also is unique in terms of its other faunal remains (see the *Mustela* sp., *Martes zibellina*, *Buteo* and *Accipiter* sections), and it seems possible this juvenile rodent, too, was intentionally placed in Grave 39. However, it is equally possible that these remains entered the grave as the stomach contents of the sable found on the hands of this burial.

Marmota sibirica

Remains of Siberian marmot constitute the most abundant and most ubiquitous category of unmodified faunal remains at Shamanka. These include 1533 specimens from 44 graves (Nos. 8, 11, 12, 14–18, 22, 23, 26, 33, 39, 47, 48, 51, 52, 54–56, 59, 62–65, 69, 71, 73–78, 80–82, 85, 92, 93, 95, 96, 104, 108, and 112) and 1 ritual pit (No. 100) and all but 4 of these specimens are incisors, with the remaining items being mandibles. The incisors represent a minimum of 425 individuals. None of the four mandibles have their incisors intact. The incisors were not modified in any way, but many were found directly on human skeletons, almost certainly indicating they were attached to garments worn by the deceased (c.f., Chapter 5).

The abundance of the marmot remains at Shamanka II warrants some discussion of its characteristics. Marmots inhabit desert, steppe, and forest-steppe habitats, and historically were present in Northwestern China, Mongolia, and parts of Siberia (Zimina, 1978). These marmots were present in the upper portion of the Tunka Valley west of Shamanka as recently as the 1970s (Zimina, 1978). The nearest other populations are found

in southern Buriatia, roughly 100 km south of Shamanka, and along the Selenga River south of Ulan-Ude (Erbajeva and Alexeeva, 2009; Townsend, 2009; Zimina, 1978). Their ranges in the Middle Holocene are of course unknown.

Adult Siberian marmots weigh 6–8 kg, and all members of the species are highly social and can live in colonies of over 1000 individuals (Murdoch et al., 2009; Zimina, 1978). In the northerly portions of their modern range (southern Trans-Baikal), Siberian marmots hibernate from early September through March, but generally do not exit their burrows until April. Summer is the period of intensive feeding and weight gain, and by August the animals are at their fattest. Fat layers just below the skin, in some individuals 1–2 cm thick, act as energy stores for the hibernation period. Healthy adult females can have up to 1 kg of fat in their bodies by the end of summer. The marmots congregate in September just prior to hibernation, with some burrows eventually holding as many as 20 individuals. Marmots are a common and highly valued food item to this day in parts of Mongolia and Siberia, have desirable furs, and are used in a suite of medicinal applications (Belikov, 1994; Kolesnikov et al., 2009; Pegg, 2001: 245–7; Zimina, 1978). Historically, they were hunted or trapped during the entire non-hibernation period, but particularly in late summer and early fall when they were congregated and at their fattest.

Mitochondrial DNA was extracted from single marmot incisors from five graves at Shamanka (Nos. 16, 39, 56, 59, and 104) and then compared with the mitochondrial DNA sequences of five marmot incisors recovered from Early Neolithic graves at the Lokomotiv-Raisovet cemetery located at the confluence of the Irkut and Angara rivers (Masuda et al., 2015). These analyses demonstrated the teeth were securely attributed to *Marmota sibirica*, but that the genealogy of the marmots at Shamanka and Lokomotiv-Raisovet were fairly distinct. This suggests non-overlapping marmot hunting areas for the populations using these two cemeteries.

Castor fiber

Ten specimens from 6 graves (Nos. 11, 15, 16, 44, 53, and 62) were identified as remains of beaver, and 5 of these were modified or fragments of incisor teeth. The remaining 5 specimens from this species are mandibles, and 4 of the 5 have their incisors broken off, with tooth roots still present in their alveoli. All of the modified incisors appear to have been ground and shaped to function as implements. When the beaver elements were found in intact burials, they were always located in clusters with other objects in the head or upper torso area. Beavers have been extirpated from the Baikal region.

Urocitellus undulatus

Remains from long-tailed ground squirrel (*Urocitellus undulatus*), or suslik, were found in only two graves (Nos. 10 and 44), and in both cases consisted of some cranial and post-cranial elements. Suslik inhabit the Shamanka area today and are a burrowing species. It is possible that the remains of this species were not intentionally placed in the grave but rather represent animals that died within burrows that intersected the grave pits. Such incidental occurrences of partially complete suslik skeletons are sometimes present in the region's camp sites (e.g., Sagan-Zaba II).

Lepus spp.

Similar to the marmot remains, the 115 specimens of hare at this site are dominated by incisors, but 10 mandibles or mandible fragments also are present. None of the teeth are modified, and 5 of the 10 mandible fragments are missing their incisors, or they are broken off in the alveoli. These remains are most likely of *Lepus timidus*, which is by far the most

common hare in the region today, with the only other species present being *Lepus europeaus* (generally to the west of Baikal; Ognev, 1966). *L. timidus* can inhabit both steppe and forest regions. Unlike marmots, they do not hibernate in winter, and only the young typically inhabit burrows.

Hare (or probable hare) remains were found in 13 different graves (Nos. 11, 16, 25, 30, 33, 42, 51, 54, 71, 78, 82, 83, 104), and 9 of these graves (Nos. 11, 16, 33, 51, 54, 71, 78, 82, 104) also contain marmot incisors. Among these 9 graves, 6 are too disturbed to determine the original placement of the items. In the remaining 3 graves (Nos. 33, 51, and 82), the hare teeth are found directly intermixed with marmot incisors, and in 2 of these graves (Nos. 51 and 82), the incisors of both species were found together on the skull. The 4 graves with hare remains but lacking marmot teeth include: 1 intact grave (No. 30) with only a mandible fragment present in the upper grave fill; 2 highly disturbed graves (Nos. 25 and 83) where the original placement of the teeth cannot be determined; and 1 disturbed grave (No. 42) where the incisors were again found near (but not on) the skull. In other words, the hare remains at Shamanka are in some cases utilized much like the marmot remains at the site. They largely consist of unmodified incisors that appear to have been attached to garments, in some cases perhaps hoods or caps worn by the dead.

Carnivora

While at least 7 carnivore species were identified at Shamanka, 7 specimens were too fragmentary or too modified to identify beyond the order Carnivora. Graves 11, 12, and 14 all contain fragments of post-canine teeth from a large carnivore. Given that all of these graves contain fragmented remains of bear skulls, it is likely they are from these animals. Finally, Grave 23 contains 2 incisors from a sable-sized carnivore, both of which were ground and drilled for use as pendants.

Lynx lynx

Grave 44 contained the only specimen from a Eurasian lynx, an unmodified radius diaphysis fragment. The bone was found at the base of the grave but not in direct association with its largely intact human burial, which was positioned at a slightly higher level within the pit.

Canis spp.

Four graves contained remains that were identified as wolf or dog. Grave 7 contained 10 mandibular teeth, including 2 unmodified incisors, 2 incisors drilled for use as pendants, and 6 premolars, the latter all ground on one face, with the pulp cavities exposed in some cases. These teeth were found among other items to the right side of the intact burial in the grave. Grave 8 contained a single unmodified canid mandibular 4th premolar, though the grave is too disturbed to determine the object's original placement. The upper fill of Grave 62 contained a single unmodified canine. Finally, the badly disturbed Grave 83 contained four canid incisors. All had both broad faces of the roots ground flat, and all had remnants of holes drilled through them at their bases, perhaps from earlier use as pendants.

Canis familiaris

Grave 26 contained the whole skeleton of an adult male domesticated dog (assigned the master identification number SHA_2003.026.04). This specimen was a formal primary burial, but the skeleton's skull and neck were disturbed (but present) by subsequent reuse of the grave pit. Its identification as a domesticated dog was made using both traditional morphometric methods (Losey et al., 2011), and through three-dimensional geometric morphometrics (Drake et al., 2015).

Based on tooth wear and loss, the dog appears to have been an older adult at the time of death. It is the largest Holocene dog from the Cis-Baikal region analyzed thus far, with a shoulder height of around 60 cm, and a body mass of ~29.4 kg (Losey et al., 2011; Losey et al., 2014b). The cause of death is unknown, but there is no indication it was intentionally killed by humans. The dog experienced some ante-mortem trauma, including two rib fractures, as well as the fracture of the ventral aspect of the spinous process of thoracic vertebra 8 or 9. The spine also exhibited signs of minor spondylosis deformans and bent spinous processes, all of which we originally interpreted as evidence of burden carrying (Losey et al., 2011). We now believe the etiology of these lesions is ambiguous. Stable carbon and nitrogen isotope analysis of one of the dog's vertebral fragments showed that the structure of its diet overlapped with that of the humans at the site, having a $\delta^{13}C$ value of –16.0‰ and a $\delta^{15}N$ value of 14.0‰.[48]

Detailed interpretation of the meaning of the dog burial is presented in Losey et al. (2011). In short, the dog appears to have been treated as a form of person upon its death. It was transported to the cemetery and then buried in a manner similar to that observed for many of the humans buried at this site. Animal personhood of this sort is widely documented in the circumpolar north and elsewhere (c.f., Losey et al., 2011). Dog burials appear to have been more common during the Early Neolithic than in any other period in Cis-Baikal's prehistory (Losey et al., 2013b). Further, there is evidence in several sites from the Early Neolithic (including at Shamanka II) of humans and dogs sharing parasites (Waters-Rist et al., 2014), which also suggests particularly close physical contact between people and dogs during this period.

Vulpes vulpes

Three specimens of red fox, or probable red fox, were present at Shamanka. These include an os coxa fragment from the upper fill of Grave 11, an incisor drilled for use as a pendant from an unknown location in Grave 23 (the object has no catalog number), and a nearly whole mandible in Grave 17. This latter item was found in a cluster of other objects that was originally under the head of the right burial (Burial 17.02) in this grave; the skull of the burial was removed in antiquity.

Ursus arctos

Brown bears were one of the most ubiquitous species at Shamanka, being found in 35 of the Early Neolithic graves (Nos. 4, 8, 10–12, 14–18, 20–25, 28, 30, 45, 47–49, 53, 55, 56, 59, 60, 62, 64, 71, 78, 86, 88, 90, and 112; c.f., Chapter 6). We identified bear remains from 34 graves, but a single bear specimen also is reported in one additional grave (No. 15) but was unavailable to us for verification. While just over one third of the graves at the site clearly contained bear remains, their actual ubiquity is likely under-represented in this figure. This is due to the fact that the vast majority of the bear remains appear to have been originally interred in the upper portions of the grave pits, and many seem to have been subsequently removed from the pits when the graves were revisited or reused in antiquity. Evidence to support this assertion comes from the fact that remains of bears numerically dominate the faunal remains recovered from the sediments surrounding the graves (c.f., Bazaliiskii and Weber, 2024). Radiocarbon dates on three of these non-grave bear remains show that they clearly date to Phase 1 of the cemetery use (Losey et al., 2013a: Table 4.2).

[48] The stable carbon and nitrogen values were erroneously listed as –16.1‰ and 13.0‰, respectively, in a published paper (Losey et al., 2011).

With only two exceptions (a bear phalanx in Grave 4 and a modified radius in Grave 64), bear remains in grave pits are represented by elements of the head and bacula. All appear to be from adult animals (no juvenile dentition was present) and in several cases teeth are extensively worn, indicating that some bears were of advanced age. Of the head elements, only the heavily modified canine (a cutting implement) in Grave 53 was found on or near a human body. Otherwise, head bones and teeth were in the upper and middle levels of grave pits and in no direct association with particular human bodies. In the two cases where whole or nearly whole crania were recovered (Graves 22 and 90), they were found inverted with their eye-sockets facing down. These two specimens also showed multiple cut marks, most likely from disarticulation and defleshing, and both had their brain cases opened while the bone was still fresh. All of the remaining crania were highly fragmented, perhaps from post-depositional erosion. Several of the mandibles and fragmented crania also have cut marks, signs of burning, and in one case gnawing marks. Nearly all maxillae and mandibles are missing teeth, and isolated teeth were recovered from a number of graves. In other words, it appears that at least some of the bear remains came from animals that were butchered and perhaps consumed, and many head elements appear to have been exposed, handled, and likely transported prior to being deposited.

In contrast to the pattern seen in the placement of bear head elements, the bacula were often found among concentrations of artifacts near human bodies, or directly on bodies. Eight graves yielded bacula, and 6 of these either contained only adult males, or the bacula in graves with individuals of both sexes were on or near the adult male bodies (c.f., Chapter 6). The 2 exceptions are the baculum found under the shoulder of a 1.5–3-year-old child (SHA_2003.028) in Grave 28, and the 2 bacula in Grave 78, which contained the disarticulated and scattered remains of 4 adult individuals of both sexes. The specimen in Grave 28 was extensively ground at its distal end to form a sharp piercing implement (an awl) while nine other specimens show marks from light grinding or use wear. One baculum in Grave 21 was incised around its circumference, perhaps for facilitating suspension on a cord, and one from Grave 112 was grooved lengthwise near its base for an unclear purpose. Recall also that five additional bacula were found in the sediments surrounding the graves, perhaps indicating that they too were removed from graves during episodes of grave reopening.

A detailed analysis of the bear remains at Shamanka is beyond the scope of this chapter, but can be found in Losey et al. (2013a).[49] To summarize, we argue that the skull remains found in the upper portions of the graves are from bears that were killed and eaten. The skulls were then transported to Shamanka and placed in the graves as part of the process of providing mortuary rites for the bears themselves. Similar practices are widely historically documented across the circumpolar north (c.f., Losey et al., 2013a and references therein). Bears are often considered to be powerful and potentially vengeful beings, particularly against those that have shown them disrespect, including disrespect of their bodily remains. Further, bears also are sometimes considered to be ontologically similar to humans, including having individual souls that can cycle through the cosmos, if properly treated. The mortuary rites (and a suite of other practices) are carried out to show the animals respect and deference, as some of the animals' awareness is associated with their remains after death. Moreover, historically documented bear rituals often are done to ensure that the animals can regenerate, as the rites involve carefully sending the bears' souls to other tiers of the cosmos, and protecting their skeletal remains (through burial, submersion in water, and so on), the integrity of which is linked to the survival of their souls.

[49] Additional angles are discussed in Chapter 6.

Phoca sibirica

Remains of Baikal seal were found in seven graves at Shamanka (Nos. 7, 18, 23, 46, 71, 78, and 83). All but 4 of the 20 seal specimens are canines. Eleven of the 16 canine specimens are halves of teeth that were split lengthwise. While it is possible that these specimens were intentionally split, we have observed both modern and archaeological canines from Baikal seals that naturally fracture in this manner. This seems to be particularly common when the teeth are from young seals (~2 years or younger), which have very thinly walled roots. The possible prevalence of canines from very young seals at Shamanka is intriguing, as young seals also dominate the Middle Holocene seal assemblages at several camp sites in the region (Nomokonova et al., 2015; Weber et al., 1993; Weber et al., 1998).

A fibula, tibia, and ulna from a seal were present in Grave 46, and all of these have their ends coarsely broken, likely prior to burial. Finally, an unmodified seal phalanx was found in Grave 71. Most of the seal remains were from badly disturbed graves and their original placement cannot be determined. In those few cases where they were found in intact graves, they were all found some distance away from the human remains, either at the burial level or in the upper grave fill — none were found directly on an intact human skeleton.

Lutra lutra

A single unmodified otter mandible was found in Grave 56. The mandible was in the upper portion of the grave in association with disarticulated human remains and other artifacts. The human skeletal remains in the grave were from two children (Bazaliiskii et al., 2024).

Mustela sp.

Grave 39 contained the only remains of weasel, consisting of the unmodified mandibles from a single adult individual. The location of the mandibles in the grave is unknown (they received no catalog numbers and are not mentioned in the grave description).

Martes zibellina

Remains of sable were found in 23 graves at Shamanka (Nos. 4, 7, 8, 10, 11, 13, 15–18, 21, 23, 34, 39, 42, 51, 53, 56, 59, 64, 75, 86, and 112), with the total number of specimens present being 142. All appear to be from adult animals, and no specimens were modified. In all but two of the graves with sable remains, only elements of the skull were present. The original position of these items within the grave is impossible to determine due to significant grave disturbance. Where the burials were mostly intact, sable remains were frequently located directly next to interred skeletons and within clusters of other artifacts, all of which were under the head or upper back, or near the feet. In only one case were sable skull remains found directly on the body (excluding Gr. 39, described below), and these were found on the back of a 25–29-year-old human male buried in the prone position in Grave 75.

The remaining two graves (Nos. 39 and 59) with *Martes zibellina* remains contained the skull and post-cranial elements of one sable each, suggesting that whole or nearly whole sable skeletons were interred in the graves. Grave 39 contained the burial of an adult human male, 40–44 years of age, which was interred in the extended supine position, with the hands resting over the pelvis. A disarticulated partial skeleton of a sable was placed on the palms of the hands at the time of burial (Fig. 7.3). In Grave 59, which contained the remains of two individuals (Burial 59.01, a 35–39-year-old male, and Burial 59.02, a 15–19-year-old probable female, separated by a sterile layer of sediment; Bazaliskii et al.,

2024), sable skull and postcranial elements were found scattered through the lower portions of the grave pit in association with Burial 59.02. Since the remains of this young female were substantially disturbed and incomplete, it is impossible to determine how the sable remains were originally buried.

Sable are relatively small (adult body masses range from 0.6 to 1.68 kg) and solitary carnivores with dark brown to black coats and are widely distributed in Siberia, preferring dense coniferous forests on both flatlands and mountains (Monakhov, 2011). While certainly edible, historically these animals are primarily hunted and trapped for their furs (Cherkassov, 2012).

Figure 7.3. Shamanka II, Grave 39: A disarticulated partial sable skeleton on the hands of Burial 39. Figure by the BAP

Artiodactyla

Specimens that could only be identified as being large or small even-toed ungulates were found in three graves (Nos. 51, 78, and 108). These specimens were too modified or fragmentary for more specific identification.

Sus scrofa

Pendants made from wild boar canine enamel are relatively common at Shamanka, appearing in 24 graves (Nos. 14, 16, 21–25, 30, 42, 48, 51, 52, 54, 61, 62, 65, 69, 71, 73, 78, 80, 86, 92, and 112), often found on or near the skull of undisturbed burials (c.f., Chapter 5). The pendants typically consist of arc-shaped sections of enamel that were carefully removed from one face of the tooth. The edges were then ground, and in a few cases also incised with simple lines. The ends of the arcs were drilled for the attachment of cordage to facilitate suspension of the pendant on the body. Several specimens were repeatedly drilled, likely indicating the objects fractured during use and then were refitted. Note that the boar tusk pendants are found in direct association with both adults and children, and with both sexes (Chapter 5). The only other wild boar specimens at Shamanka II are a scapula with its spine mostly removed and heavily worn (possible hide scraper) from Grave 42, and an unmodified incisor from Grave 30.

While remains of wild boar are relatively ubiquitous at Shamanka, remains of these animals are very rare in the region's Middle Holocene camp sites. Wild boar are widely hunted today in Eurasia and elsewhere and are generally regarded as ferocious prey that can pose a serious threat to humans and other animals when confronted (Cherkassov, 2012).

Moschus moschiferus

Canines from Siberian musk deer were found in 16 graves (Nos. 7, 11, 14, 16, 17, 34, 35, 47, 52, 53, 56, 58, 64, 78, 83, and 86), with the only other element from this species present being an unmodified metatarsal in Grave 104. The total number of canines at Shamanka II is 62, and only 4 of these are modified. Three of the four modified specimens appear to have been notched for hafting and one has several barbs along one edge; we suspect all three were used as barbs for composite fishhooks. The remaining specimen is ground and its function is unclear. In no cases do the teeth appear to have been worn on the body. In those graves where original placement could be assessed, the musk deer teeth were always found within clusters of artifacts under the head and upper back.

Siberian musk deer are a small bodied (adults weigh less than 20 kg) largely solitary and nocturnal animals (Prothero, 2007). They are a highly territorial species, and only males have the large and well-developed canines seen at Shamanka. These animals are typically fearful of humans and difficult to approach, often preferring remote, forested, and mountainous habitats. The animals are used as a food source, but today they are most widely hunted for their musk, which is used in soaps, perfumes, and has various traditional medical applications (Homes, 2004; Slaght et al., 2019).

Cervidae

Remains of deer are very abundant at Shamanka (total specimens from the Cervidae family is 1373), being second in number only to remains of Siberian marmot. Deer remains are the most ubiquitous family of faunal remains at the site, appearing in 68% (66 of 97) of the Early Neolithic graves. Where possible, we subdivided these objects into the categories of large and small Cervidae, with the former including objects from red deer or moose-sized cervids, and the latter from reindeer and roe deer-sized animals. Antler that could be

identified to the category of large cervid was far more abundant than from small deer. This pattern is likely biased by the fact that large deer antler is easier to identify than that from smaller deer — very large antler pieces, no matter how modified, simply cannot be from smaller deer, but small pieces could be from either category. Cervidae specimens identified to the species level at the site include red deer, roe deer, and moose, with reindeer not represented; these are discussed below in more detail. Remains of red deer and roe deer are most abundant, which matches closely the relative abundances of deer documented in the region's Middle Holocene camp sites (Savel'ev et al., 2001; Losey et al., 2014a; Nomokonova, 2011; Nomokonova et al., 2011; Nomokonova et al., 2015).

The vast majority of items at Shamanka identified to the family Cervidae are implements manufactured from antler. The only unmodified antler present at the site consists of a few small fragments with no obvious signs of working or use; these likely are fragments of other implements. The non-antler Cervidae items from the site include a few lower limb elements such as phalanges and metapodials, two rib fragments, and a number of post-canine teeth fragments. None of these elements, with the exception of the ribs, comes from portions of the body that provide significant sources of meat; there is no indication of deer meat on the bone being placed in the graves.

The cases where post-canine teeth are present deserve further discussion. Graves 23, 33, 40, 93, and 95 all contained multiple post-canine teeth from cervids, and in no cases do these teeth appear to have been modified. In most instances these graves are disturbed and the original placement of the teeth cannot be determined. However, in Grave 33 the teeth were all found in a single patch with a disturbed burial, while in Graves 93 and 95, the teeth were in discrete clusters in direct association with intact human burials. The teeth from Grave 93 included many that could be identified as Siberian roe deer, with many others that were from red deer or moose-sized animals. Those from Grave 95 were entirely from a large cervid. Notably, in all graves with cervid post-canine teeth, the specimens are broken, and in some cases show wear or abrasion. It seems possible these specimens were broken and abraded while in a container, perhaps for use as rattles, and these containers were then interred with the dead.

Finally, a few implements made from *Cervidae* elements were found clearly on human skeletons (as opposed to next to or under them). In several graves (Nos. 17, 21, 45, 48, 70, and 73), shafts of insert tools were found on the upper torso of burials, some of which perhaps were hung from the neck on a cord. In Grave 66, an antler wedge was found directly on the left arm of the adult burial. An antler harpoon head was found in Grave 74 on the upper chest or shoulder, while an object of unknown function was found in the hip area of the burial in Grave 96.

Alces alces

Remains of moose are rare at Shamanka, being found in no more than three graves (Nos. 8, 15, and 59). A highly fragmented partial cranium (in 60 pieces) was found scattered in the upper portion of Grave 8. A fragment of 2nd mandibular premolar, drilled through its root, was found in the upper portion of Grave 15. Finally, a possible moose mandible (Fig. 7.4) was found in Grave 59 within a cluster of other implements and in association with a disturbed burial. This specimen was heavily modified, with only the body of the mandible intact. The alveolar section of the body was hollowed out, and its margins showed significant wear or polish, probably from use as a scraper.

Figure 7.4. Shamanka II, Grave 59: A possible moose mandibular body with the alveolar section hollowed out. Figure by P. Kurzybov

Capreolus pygargus

Specimens identified as Siberian roe deer (or probable roe deer) were present in 25 graves (Nos. 8, 11, 15, 16, 20, 21, 23, 25, 26, 34, 42, 50, 52, 53, 56, 59, 62, 64, 69, 71, 79, 83, 86, 93, and 108). These remains are dominated by teeth and lower limb elements, particularly metapodials and tarsals. The exceptions include three scapulae that were modified into cutting or scraping implements (1 in Gr. 25 and 2 in Gr. 34), and the following unmodified specimens: a mandible fragment from Grave 23; a vertebra in Grave 62; a patella in Grave 63; a 2nd phalanx fragment in Grave 71; a femoral head in Grave 79; and a 3rd phalanx in Grave 86. All of the items above, except the scapula implements and the mandible, are relatively small elements and could be incidental inclusions from the cultural layer.

With the exception of three fragments, all roe deer metapodials from Shamanka were modified for use as implements, or appear to be remnant pieces from tool production. In Graves 21, 52, 53, 56, 69, and 83, roe deer tarsals were found. In all but one of these graves (No. 69), metatarsal implements also were present. Commonly, the tarsals were found in clusters of implements, and these clusters contained metatarsals that were modified to form scraping implements — the posterior faces of the diaphyses were opened and the posterior margins of the diaphyses were sharpened and exhibited heavy polish or wear. The tarsals appear to have been left attached to these implements, perhaps functioning as handles or grips. These elements are naturally tightly bound together by connective tissues and can be difficult to separate.

Roe deer teeth were found in three graves (Nos. 64, 93, and 108), with those in Grave 93 described above in the *Cervidae* section. In Grave 64, 3 unmodified incisors were present, 1 in the upper grave pit, the other 2 near the legs of an intact burial. The two incisors from Grave 108 were both drilled through their roots for use as pendants. They were found directly under the cranium of an intact burial.

Cervus elaphus

Red deer remains (or probable red deer) were found in 25 graves (Nos. 11, 14, 15, 17, 18, 20–22, 25, 26, 28, 33, 35, 48, 52, 53, 56, 59, 61, 69, 83, 96, 104, 108, and 112), with 304 of the 350 specimens being canines, nearly all of which were modified for use as pendants. Eleven of the remaining specimens are antler beam or tine fragments (all were modified) that were large enough to be identified. Other teeth include 28 maxillary post-canine teeth fragments from Grave 33 described in the Cervidae section above, and a single unmodified incisor from Grave 96. Unmodified carpals and tarsals were found in Graves 25, 35, 48 (2 specimens), and 69, and an unmodified fragment of a tibia was present in the upper portion of Grave 48. Metapodial implements were found in Graves 20 (3 specimens), 21, 25, and 104. The remaining two red deer items are a scapula in Grave 20 with its spine removed, and a scraping implement made from a mandible in Grave 112.

A total of 304 red deer canines were found in 15 graves (Nos. 11, 14, 17, 22, 25, 26, 28, 35, 52, 56, 59, 61, 104, 108, and 112), with nearly all having biconically-drilled holes through the roots for use as pendants (c.f., Chapter 5). Only six specimens were whole and unmodified. Many of the graves containing red deer canine pendants were too disturbed to determine their original location within the graves (see Gr. 25, 52, 56, 59, and 104). In Graves 14, 17, and 61 the teeth were generally found on the cranium and likely were parts of head gear worn by the deceased; two unmodified specimens in Grave 17 were found within a cluster of other artifacts. Grave 22 was the only case where a single canine was present, and it was found near the right shoulder of an intact burial. Three canines from Grave 26 were found directly on the skeleton of a dog, which was partially disturbed, with the other from this grave found at the same level as the dog burial. In Grave 28, all of the canines were found within a cluster of bone pendants between the upper legs of an intact child burial. Two canines were found in the upper portion of Grave 108, with the rest located in a cluster near the feet of the bottom burial in the pit. Finally, Grave 112 produced several canines, two in the patch of soil above the burial, the remainder in the head and upper chest area of the partially disturbed skeleton.

Undifferentiated mammal

Objects that could be identified only as mammal or large mammal were abundant at Shamanka, totaling 1046 items. These items were either too modified or too fragmentary to allow more specific identification. We address only two sets of these remains here, as the diversity of items present is too great to review in detail.

As many as 387 items in this group were bone pendants, which were found in 5 graves (Nos. 6, 28, 49, 64, and 108), with three graves (Nos. 28, 64 and 108) accounting for 97% of all bone pendants (n = 377). They are oval to subrectangular in outline, and measure between 9 and 16 mm in length; they resemble the red deer canine pendants found at the cemetery (c.f., Chapter 5). In Grave 6, 2 bone pendants were found in the middle levels, above the burial, and 1 was found at the burial level between the skull and the E wall of the pit. In Grave 28, the bone pendants were collected from the area around the pelvis and between the femora intermixed with 9 red deer canine pendants. In Grave 49, 7 bone pendants were found underneath the face of the prone burial along with 319 pyrophyllite beads. In Grave 64, with two individuals, 30 bone pendants were found among the fully disarticulated bones of the 7–10-year-old subadult (Burial 64.02) occupying the upper parts of the grave pit, so their original position could not be established. The remaining 27 bone pendants were found in association with the fully articulated interment of a 30–39-year-old male (Burial 64.01), again in conjunction with a

number of pyrophyllite beads, around the entire body, in such spots as the head, left shoulder, chest, abdomen, and legs. In Grave 108, the 210 bone pendants were found in three areas: 65 in association with the upper Burial 108.01 (35–50-year-old male, semi-articulated and incomplete),[50] 59 in association with the bottom Burial 108.03 (25–35-year-old male, articulated and quite complete), while the remaining 86 pendants were collected from the matrix (~50 cm thick) between these two interments commingled with some human bones and a number of artifacts (Bazaliiskii et al., 2024).[51] Bone pendants were found in many locations around both burials, in some cases in clusters of about a dozen or so specimens, along with red deer canine pendants. Only Graves 28 and 108 contained both bone and red deer canine pendants, however, the number of the latter was low in both cases: 9 and 16, respectively. In all of the above cases, it is possible the bone pendants were produced to mimic red deer canine pendants; the mammal bone to produce such objects clearly being more abundant than canines (c.f., Chapter 8). Graves 49 and 64 both contained bone pendants intermixed with pyrophyllite beads, in both cases found around the cranium, likely from head gear worn by the deceased.

The other set of mammal bone objects found directly on human skeletons are a series of shafts of insert tools and other implements, most typically found on the upper torso. These include shafts of insert tools in Graves 18, 22, 64, 70, 88, and 92, all manufactured from limb elements. Grave 96 also included a shaft of an insert tool, but it was found in the hand of the burial, not on the chest. Finally, Grave 45 contained a piercing implement that was directly on the abdomen or hip area of the burial, and Grave 58 contained two implements made from ribs and a bone harpoon head found directly on the skeleton, which had its upper body in the supine position, and the legs bent up over the head.

2.2. Bird remains

A total of 451 bird specimens were recovered from Early Neolithic graves at Shamanka, and these are summarized in Table 7.2. Of this total, only 79 specimens (17.5%) were unassignable to order or more specific level. Essentially all of the bird remains appear to have been from implements, or were likely material intended for use as implements. There is no indication of the interment of whole birds or fleshy portions of bird bodies in the graves. Well over half of the identified specimens (n = 228; 61.2%) were from birds of prey (Accipitriformes), which are the single most ubiquitous group of bird remains at the site. Many of these specimens are unmodified talons. Remains of other more specifically identified birds of prey were also relatively common at the site, including remains of eagles, hawks, kites, and buzzards, again mostly represented by talons and other pedal elements. Second most abundant and ubiquitous were remains of swans (*Cygnus* spp.), many of which were modified into cases for holding needles and other items. Small numbers of specimens were present from a suite of other birds, with aquatic species being well represented. Note that a formal analysis of all bird remains from this site is available in Fleming (2013).

[50] The upper body was disturbed at the time when the neighboring EBA Grave 107 was originally excavated.
[51] Originally, these elements were designated a separate interment (Burial 108.02) but upon further assessment were considered stray human bones that entered the grave accidentally (c.f., Chapter 6).

Table 7.2. Summary of bird specimens from Shamanka II

Taxon	Common name	NISP	# Graves	Ubiquity %
Anatidae	Ducks, geese, swans	3	2	2.1
Cygnus sp.	Swan	31	12	12.2
c.f. *Cygnus* sp.	c.f. swan	15	8	8.2
Anser cygnoides	Swan goose	1	1	1
Mergus sp.	Merganser	1	1	1
Mergus c.f. *merganser*	c.f. Common merganser	1	1	1
Mergus c.f. *serrator*	Red-breasted merganser	3	1	1
Mergus merganser	Common merganser	2	1	1
c.f *Mergus* sp.	c.f. merganser	1	1	1
Melanitta sp.	Scoter	1	1	1
Gavia stellata	Red-throated loon	9	5	5.1
Gavia c.f. *stellata*	c.f. Red-throated loon	1	1	1
Gavia sp.	Loon	3	2	2
c.f. *Gavia* sp.	c.f. loon	1	1	1
Phalacrocorax sp.	Cormorant	6	1	1
Botaurus stellaris	Eurasian bittern	2	1	1
Accipitriformes	Diurnal birds of prey	228	15	15.3
c.f. *Milvus migrans*	c.f. Black kite	2	1	1
Buteo lagopus	Rough-legged buzzard	2	1	1
Buteo c.f. *lagopus*	c.f. rough-legged buzzard	1	1	1
Buteo hemilasius	Upland buzzard	2	1	1
Buteo sp.	Buzzards	4	1	1
Halieetus/*Aquila*	Large eagle	17	7	7.1
c.f. *Halieetus*/*Aquila*	c.f. large eagle	8	5	5.1
Accipiter sp.	Goshawks, sparrowhawks	6	1	1
Accipiter c.f. *gentilis*	c.f. northern goshawk	5	1	1
Accipiter nisus	Eurasian sparrowhawk	1	1	1
Grus grus	Eurasian crane	8	4	4.1
c.f. *Grus grus*	c.f. Eurasian crane	2	2	2
Anthropoides virgo	Demoiselle crane	3	1	1
Coccothraustes coccothraustes	Hawfinch	2	2	2
Aves-undiff.	Undifferentiated Birds	79	27	27.6
Total		451		

Anatidae

Graves 12 and 16 contained a total of three elements from the Anatidae (ducks, geese, and swan) family, all of which were unmodified. All were from duck-sized birds.

Cygnus sp.

Elements from swan or probable swan were found in 17 graves (Nos. 8, 15, 17, 23, 42, 51, 53, 59, 64, 68, 73, 79, 83, 86, 96, 104, and 108). In all but two cases, item 24 in Grave 42 and item 3 in Grave 73 — both tibiotarsii — these were wing elements, with ulnae, carpometacarpii, and 1st phalanges being particularly abundant (Fig. 7.5). The ulnae and carpometacarpii all appear to have been modified for use as carrying cases, probably for needles and other small items (c.f., Chapter 6). Typically, one or both ends were broken off and the bodies lightly ground. Some of the phalanges were probably left attached to the carpometacarpii cases. There is no indication that whole feathered wings were placed in the graves, nor are there indications that meat-bearing portions of the body were interred.

Figure 7.5. Shamanka II, Grave 42: Four swan wing bones (three ulnae and one radius) and a tibiotarsus. Figure by P. Kurzybov

Tundra swans (*Cygnus columbianus*) inhabit the Cis-Baikal region today when migrating to and from their arctic breeding and nesting sites (Mlíkovský, 2009; Flint et al., 1984). Whooper swans (*Cygnus cygnus*) nest and breed in the Baikal area, being present in this area from spring through fall. Nesting sites are typically on the ground and near the water.

Anser cygnoides

A single specimen from a swan goose was found in Grave 26 (Fig. 7.6), which consists of a maxilla and premaxilla, or upper beak. This item may have been cut from the rest of the skull, as was done with beaks of several other birds at the site, including that of at least one merganser in this same grave. Swan geese are relatively large dabbling waterfowl, and inhabit the region from spring through fall (Mlíkovský, 2009; Flint et al., 1984).

Figure 7.6. Shamanka II, Grave 26: A swan goose maxilla and premaxilla. Figure by P. Kurzybov

Mergus spp.

Eight specimens of merganser were found in four graves (Nos. 21, 26, 28, and 62). Three were identified as common merganser (*Mergus merganser*) or probable common merganser, and one as probable red-breasted merganser (*Mergus serrator*), the remainder classified to genera only. Grave 21 contained two unmodified merganser carpometacarpii, while the specimens from the other graves are all maxilla or premaxilla fragments of the upper beak. Mergansers are fish-feeding ducks that are mostly present in the region from spring through fall, but some have been known to overwinter at the Angara River's outlet from Lake Baikal (Mlíkovský, 2009; Flint et al., 1984).

Melanitta sp.

Grave 34 contained a single humerus from a scoter that was gnawed at both ends. This may be an incidental inclusion in the grave. Scoters are present in the Baikal region from spring through fall (Mlíkovský, 2009).

Gavia spp.

Fourteen specimens from loons or probable loons were found at Shamanka in six graves (Nos. 8, 11, 18, 23, 53, and 56). Ten of the specimens were identified as red-throated loon (or probable red-throated loon). The specimen from Grave 56 was an unmodified fragment of a humerus, while all other loon bones in the site consist of beak elements which appear to have been cut from the skull. In other words, their uses appear parallel to those of the bulk of merganser remains at Shamanka II. Loons migrate through the Baikal region in summer and are diving birds that feed primarily on fish (Mlíkovský, 2009; Flint et al., 1984).

Phalacrocorax sp.

Six fragments of a single cormorant beak were found in Grave 8, and like the loon and merganser beaks mentioned above, this specimen appears to have been cut from the rest of the skull. Cormorants are spring through fall inhabitants of the region, nest in colonies, and primarily forage on small fish (Mlíkovský, 2009; Flint et al., 1984).

Botaurus stellaris

Grave 23 contained the beak (in two pieces) of a single Eurasian bittern which was cut from the rest of the skull. Bitterns are reclusive wading birds and breed in the region during the summer (Mlíkovský, 2009; Flint et al., 1984).

Accipitriformes

Remains identified as being from birds of prey were found in fifteen graves (Nos. 7, 15, 17, 22, 23, 35, 39, 52, 53, 56, 63, 64, 75, 78, and 83) making this category of bird remains the most ubiquitous at the site. Specimens assigned to this category total 228 items, and 179 of these were found in Grave 39. This grave contained a cluster of unmodified lower legs and feet (tarsometatarsii and pedal elements) bones from at least 10 birds of prey. The tarsometatarsii were identified to genera or species (see Buteo, Accipiter, and c.f. Milvus migrans sections below), while the 179 pedal elements were only identified as belonging to Accipitriformes. These latter elements were almost certainly also from these more specifically identified individuals.

All but two of the remaining 49 Accipitriform specimens are talons from medium to large hawk-sized birds of prey, and at least 5 of these specimens had their articular ends ground. Talons of birds of prey are commonly used in the Baikal region as composite fishhook barbs, and the specimens found at Shamanka probably also were intended for this

purpose. The remaining two specimens were an unmodified 1st phalanx in Grave 64 and a humerus in Grave 78 with both ends coarsely broken off, perhaps for use as a case.

c.f. *Milvus migrans*

Grave 39 contained the left and right tarsometatarsii from a single probable black kite. As mentioned in the Accipitriform section above, these were almost certainly interred with the pedal elements of the bird in a cluster with the feet and legs of several other birds of prey. Black kites are summer inhabitants of the region and are opportunistic hunters and scavengers (Flint et al., 1984).

Buteo spp.

All nine specimens identified as belonging to the *Buteo* genus were found in Grave 39 and consist of whole tarsometatarsii and the end of a single tibiotarsus. Four tarsometatarsii specimens were identified to species, namely as *Buteo lagopus* and *Buteo hemilasius*, or rough-legged and upland buzzard. Again, these specimens were found in the cluster of leg and feet elements within Grave 39, and appear to have been buried with their feet attached. Rough-legged buzzards predominantly prey on small mammals and are winter inhabitants of the Baikal region (Flint et al., 1984). Upland buzzards appear to be year-round residents and today are mostly found from the south Baikal area and even further to the south (Flint et al., 1984).

Haliaeetus or *Aquila* spp.

Remains from large eagles were found in 9 graves (Nos. 7, 8, 15, 53, 59, 69, 78, 83, and 112) totaling 25 specimens. With the exception of a single talon, these items were modified, which prevented more specific identification. Four talons were present, 3 from Grave 83 (all modified for use as fishhook barbs), and 1 from Grave 7. All remaining eagle remains at Shamanka are long bones (humerii, ulnae, femora, and tibiotarsii) with one or both ends removed for use as cases or containers. In one instance, item 138 in Grave 53 (Fig. 7.7), a stone fishhook shank was found lodged in an eagle femur. These modified remains could have been used for storing small items, and line and thread could have been wound around their diaphyses.

Figure 7.7.
Shamanka II, Grave 53: A soapstone fishhook shank lodged in an eagle femur. Figure by P. Kurzybov

Accipiter spp.

Remains of goshawks and sparrowhawks were identified in 2 graves (Nos. 21 and 39) totaling 12 specimens. Grave 21 contained an unmodified carpometacarpus from *Accipiter nisus*, or Eurasian sparrowhawk. These are small birds of prey that utilize the region in summer as a breeding area (Flint et al., 1984). Grave 39 contained 6 tarsometatarsii from at least 4 individuals identified as Accipiter sp. Five tarsometatarsii from at least four probable *Accipiter gentilis*, or northern goshawk, were also present in this grave. All were probably interred with their pedal elements intact in the cluster of bird legs and feet found in Grave 39, but these foot elements were identified only to the Accipitriformes group. Northern goshawks are year-round inhabitants of the area and prey on both birds and small mammals (Flint et al., 1984).

Grus grus

Remains of Eurasian crane (or probable Eurasian crane) were found in 6 graves (Nos. 23, 30, 59, 64, 68, and 108), with a total of 10 specimens being present. Grave 23 contained a fragment of the upper beak of a crane which appears to be unmodified. A possible case or container made from a crane carpometacarpus was found in Grave 59, while a whole carpometacarpus was present in Grave 64, which was unmodified except for a single possible cutmark. Graves 30, 59, 64, and 68 have crane tarsometatarsii that were embellished with incised lines and have holes cut or drilled through their diaphyses. Grave 59 included two such items, probably made from the left and right tarsometarsii from the same individual. Finally, Grave 30 contains a similar item but it instead was manufactured from a crane tibiotarsus. Eurasian cranes are large, tall birds that migrate to the Baikal region in summer (Mlíkovský, 2009; Flint et al., 1984).

Anthropoides virgo

Grave 23 produced the site's only remains of Demoiselle crane, which consist of three unmodified fragments of the upper beak. This crane species prefers the grassland habitats of Central Asia, including areas of Northern Mongolia and southern Trans-Baikal (Mlíkovský, 2009; Flint et al., 1984). It is present in these northerly portions of its range from spring through fall.

Coccothraustes coccothraustes

Dentary or lower beak bones from hawfinch were found in Graves 8 and 85. In both cases the elements were unmodified. Hawfinches have a maximum length of about 18 cm and are shy birds, preferring the treetops, and feed on seeds from trees. It is a summer resident of the south Baikal area (Flint et al., 1984). They were likely not food items and may be incidental inclusions in the graves.

Undifferentiated bird

Twenty-seven graves at Shamanka (Nos. 8, 11, 12, 15, 17, 18, 20, 23, 25, 26, 46, 49, 51, 52, 53, 57, 58, 59, 69, 71, 73, 78, 83, 85, 86, 96, and 108) contained bird remains that were either too fragmentary or too heavily modified to allow for more specific identification, totaling 79 specimens. The vast majority of these specimens consist of implements or implement fragments made from the diaphyses of humerii, ulnae, and radii. The exceptions are 4 beak fragments in Graves 23, 26, 51, and 71; 2 modified talons or distal phalanges from Grave 58; 2 unmodified phalanges from Grave 85; and 1 unmodified carpometacarpus from Grave 86.

2.3. Other fauna

Fish and invertebrates account for 162 specimens at Shamanka, and an additional 155 undifferentiated osseous specimens were also identified (Table 7.3).

Table 7.3. Summary of fish, invertebrate, and undifferentiated specimens from Shamanka II

Taxon	Common name	NISP	# Graves	Ubiquity %
Gastropoda	Snails	13	4	4.1
Anodonta sp.	Freshwater mussel	52	10	10.2
Acipenser sp.	Sturgeon	48	4	4.1
Esox lucius	Northern pike	19	3	3.1
c.f. *Esox lucius*	c.f. northern pike	20	1	1.0
Fish-undiff.	Undifferentiated fish	10	4	4.1
Undiff.	Undifferentiated bone	155	34	34.7
Total		317		

Gastropoda

Thirteen fragments of small snails were recovered from four graves (Nos. 51, 69, 77, 104). All specimens were too small to identify and it is possible that these snails were incidental inclusions in the graves. Their form and thickness appear consistent with local freshwater species.

Anodonta sp.

Freshwater mussel shell was found in 10 graves (Nos. 11, 18, 22, 23, 25, 26, 50, 64, 69, and 90), totaling 52 specimens. In all but three cases, these mussel shells were formed into small beads, shell rings, or pendants. The exceptions were fragments of the shell interior ('mother-of-pearl') in Grave 18, and nearly whole unmodified valves in Graves 23 and 26. This genus of freshwater mussel is present in the rivers of southeastern Siberia and Lake Baikal (Prozorova and Bogatov, 2006).

Acipenser sp.

Skeletal remains of sturgeon were found in four graves (Nos. 53, 59, 78, and 96). In all cases these consist of fragments of the parasphenoid, a large element found along the ventral edge of the neurocranium. A single sturgeon is represented in each of Graves 53 and 78, while two individuals are indicated in Grave 96. Grave 59 had parasphenoids from at least five sturgeons (Fig. 7.8; Table 7.20). The consistent presence of this single sturgeon element in the four graves clearly indicates its presence is intentional. Sturgeons are present in both Baikal (*Acipenser baerii baicalensis*) and the Angara River (*Acipenser ruthenus ruthenus*; Ruban, 2005), however, the latter do not enter the lake (Kozhov, 1950).

Esox lucius

Northern pike were represented in 3 graves (Nos. 17, 53, and 73), with a total of 39 pike or probable pike specimens being present. Grave 17 contained 2 unmodified right palatines and Grave 53 had one unmodified cleithrum and 20 scales from this fish. In both cases, it seems possible these items were incidental inclusions in the graves. In Grave 73, 16 vertebral centra were present, all from a very large pike. These items were found within a cluster of tools under the head of the burial, which suggests they were intentionally interred. Pike are common fish in the area, present in Lake Baikal and most of the region's streams and rivers (Kozhov and Misharin, 1958).

Figure 7.8. Shamanka II, Grave 59: Sturgeon parasphenoid fragments. Figure by P. Kurzybov

Undifferentiated fish

Rays, ribs, spines, and a tooth fragment from undifferentiated fish were found in 4 graves (Nos. 21, 39, 77, and 85), totaling 10 items. None were modified and it is possible these small objects were incidental inclusions.

3. Part 2. Distribution patterns: Approach

This part of the chapter examines only the unmodified faunal remains recorded in EN graves at Shamanka II. The modified remains (i.e., artifacts) have been examined already three times in this monograph. In Chapters 5 and 6 they are analyzed as grave goods and as idiosyncratic aspects of the EN mortuary ritual. These studies, however, do not go into the details of taxonomic identification of the material from which the organic artifacts were made — the subject of the third study presented in Part 1 of this chapter. Since it is reasonable to believe that at Shamanka II unmodified faunal remains were also part of grave good assemblages, it makes sense to examine their distributions across various units of analysis in the manner employed in Chapters 5 and 6.

Such analysis, however, is complicated by the presence of a cultural layer at Shamanka II formed while the cemetery was in use during the EN (Bazaliiskii and Weber, 2024) and by the fact that a large number of graves were disturbed after their original construction (46, 47%; Chapter 4, Table 4.1). These factors have two important consequences. First, some of the archaeological material in the cultural layer originates from disturbed graves. Likewise, some of the archaeological material in the graves (the subject of this examination) originates from the cultural layer and entered the graves accidentally when they were backfilled, an issue exacerbated by the large number of graves that were reopened and backfilled more than once. Obviously, none of these accidental objects should be considered part of the original grave good assemblage. In Chapters 5 and 6, the solution to this problem was to limit analysis to the categories of grave goods that are very rare in the cultural layer such as composite tools and weapons, bow and arrow

technology, knives, fishing gear, various ornaments, bear skulls, and needle cases. This solution, however, does not work for unmodified animal remains for the simple reason that they are the most abundant category of finds within the cultural layer: of 3082 recorded objects (lithics, pottery fragments, faunal remains etc.), 1816 (59%) are mammalian bones (Bazaliiskii and Weber, 2024: Table 3.4). In this situation, the most logical approach is to limit analysis to intact graves. While this reduces the number of analyzed graves roughly by half (from 97 to 49) and, consequently, also the number of unmodified faunal remains to examine, it ensures that any patterns revealed through the analysis are more likely to be archaeologically meaningful.

Moreover, the assemblage of unmodified faunal remains shows substantial taxonomic variation: the original dataset consists of 52 taxa, of which 32 are species specific; 16 are genus, family or order specific; and 4 are identifiable only as mammal, bird, fish, or gastropod. To facilitate analysis, this variation was reduced to fewer categories as presented in Table 7.4. The first five are the most general categories (Ungulates, Terrestrial Fur Animals, Aquatic Fur Animals, Fish, and Birds), from which six more specific groups are derived: Musk-Deer Canines, Hare Incisors, Birds of Prey, Aquatic Birds, Sturgeon, and Other Fish. For additional insights, Bird remains are separated into Aquatic Bird Excluding Beaks, all Bird Beaks, and Aquatic Bird Beaks. Notably, the assemblage has no beaks from Birds of Prey although there are four unidentifiable beak fragments, which are included in the category of all Bird Beaks. The last group includes four very rare categories: pieces of Mammoth ivory, complete or partial Dog and Sable Skeletons, and Canid elements (dog or wolf). This set of 18 categories (i.e., dependent variables), each measured on two scales as quantities of identified specimens (i.e., NISP or Abundance) and as Present or Absent (Ubiquity index),[52] is considered sufficient to search for meaningful distribution patterns across a number of cultural variables (i.e., independent variables). Faunal assemblages from Graves 115 and 116, excavated in 2019, are included in the dataset because the preliminary taxonomic identifications by V.I. Bazaliiskii are sufficient for an examination that employs relatively general categories. Remains of fauna that could not be identified better than carnivore and mammal are excluded from analysis. Lastly, the four specimens of freshwater mussel (found in three graves) are also excluded on the grounds that they were unlikely to provide any useful insights.

The first step in the analysis of this dataset (Table S.4)[53] involves assessment of a few descriptive statistics calculated for the following units of analysis: first for the entire cemetery (97 graves) then divided by Phase, Main Unit of Analysis (MUA), and EN Disturbance Pattern (i.e., Condition; Intact or Reopened).[54] Spatial groups of graves (i.e., NW Cluster, SE Cluster, and S Cluster) are not examined separately because this aspect is included in the definition of the MUAs.

For the second step, the dataset is limited to Intact graves and the distribution of the faunal material is examined by the following cultural variables: Phase, MUA, number of Burials (in a grave), Sex Structure (of burials in a grave), Formation (Row and Scattered), and Row (A–M). Additional constraints applied to these independent variables are explained later as relevant.

[52] In Chapters 5 and 6, the Ubiquity metric is referred to as Prevalence or Frequency rates.
[53] As a reminder, this supplement is available only in digital format.
[54] C.f. Chapter 3 for the definition of Main Units of Analysis.

Since quantities of identified faunal specimens in individual graves, and consequently also in many other units of analysis, are generally very small (Table 7.5; Table S.4), this examination focuses on the assessment of Ubiquity indices presented as counts (n) and, when practical, as rates (%) of graves in which a given category was documented. As in Chapters 5 and 6, analysis was implemented in Microsoft Excel using the Pivot Table function to generate relevant contingency tables. Since sample sizes in various units of analysis are small and, moreover, highly variable, formal statistical tests (e.g., the χ^2 or Fisher test) are not used to assess the significance of the differences between examined units of analysis. Instead, they are assessed only subjectively and, therefore, only the most obvious departures from expected distributions are reported and their potential cultural meaning explored further. For all these reasons, many patterns observed and discussed later in this chapter are qualified by the small quantities of faunal elements, low Ubiquity indices, and small size of examined units of analysis.

Quantitative data (abundances and means) of the analyzed faunal categories, both general and more specific, are also compared to the quantitative metrics describing grave goods analyzed in Chapters 5 and 6. As a reminder, grave goods used in this comparison have been grouped in the following manner:[55]

- Total: all objects (modified and unmodified excluding stray human bones) recorded within a grave (Table 7.6);
- Total of Four Main (4-Main) categories of utilitarian objects divided into:
  - Bow & Arrow technology (B&A);
  - Composite Tools & Weapons (CTW);
  - Fishing Gear (Fish); and
  - Knives.
- Total of Ornaments All (Orn. all) divided into:
  - Mass Ornaments (Mass orn.): Red Deer Canine Pendants, Bone Pendants, Other Mass Ornaments (pyrophyllite beads, marmot incisors); and
  - Non-mass Ornaments (Non-mass orn.): organic and inorganic adornments (split boar tusk pendants, animal tooth or shell pendants; shell, limestone or calcite rings, and lithic pendants).
- Total of Five Main (5-Main) categories: Four Main utilitarian + Ornaments All.

Such summaries of grave goods for all relevant units of analysis are provided in Table 7.6, while data for even more specific categories of grave goods (e.g., needle cases and bear skeletal remains) are added to the relevant tables.

In order to save space and to make the discussion more transparent, the large number of contingency tables generated has been reduced to a few summary tables (Table 7.7; Table 7.8; Table 7.9) with the most relevant information. Lastly, although included in the original dataset (Table S.4), remains of gastropods, mouse, suslik, frog, and scoter are excluded from analysis because most likely they are incidental inclusions and may even substantially postdate the original EN graves. Hawfinch remains, found in two graves, are also excluded from analysis. Hawfinch is a bird somewhat smaller than the common sparrow and it is difficult to see any kind of utility it could present to these EN people. It is more likely that the presence of hawfinch remains within the cultural layer was accidental and that they entered the EN graves inadvertently at the time when they were backfilled.

[55] C.f. Chapter 5 for additional information about what objects are included in each category.

Table 7.4. List and groups of faunal categories analyzed

No.	Variable	Short name	Description
1	Ungulates	Ungulates	All ungulate bones & teeth (including musk deer canines)
2	Terrestrial Fur Animals	FurTer	All terrestrial fur animal bones & teeth (including sable skeletons & hare incisors)
3	Aquatic Fur Animals	FurAq	All aquatic fur animal bones & teeth
4	Fish	Fish	All fish elements (including pike, sturgeon & undifferentiated elements)
5	Birds	Bird	All bird elements (including all groups & undifferentiated; beaks & non-beaks)
6	Musk Deer Canines [a]	MuskCAN	Musk Deer canines
7	Hare Incisors [b]	HareINC	Hare incisors
8	Birds of Prey [c]	Raptor	All Accipitriformes (raptors)
9	Aquatic Birds [c]	AqBird	Water birds (including beaks)
10	Sturgeon [d]	Sturgeon	Sturgeon parasphenoids
11	Other Fish [d]	OtherFish	Pike & undifferentiated fish
12	Aquatic Birds excl. Beaks [e]	AqBird_ExBEAKS	Water birds (excluding beaks)
13	All Bird Beaks [c]	BirdBEAKS	All bird beaks (all categories)
14	Aquatic Bird Beaks [f]	AqBirdBEAKS	Water bird beaks
15	Mammoth	Mammoth	Mammoth
16	Dog Skeletons	DogSKEL	Partial or complete dog skeleton
17	Canid	Canid	Undifferentiated canid
18	Sable Skeletons [b]	SableSKEL	Partial or complete sable skeleton

[a] Also included in variable: Ungulates
[b] Also included in variable: FurTer
[c] Also included in variable: Bird
[d] Also included in variable: Fish
[e] Also included in variables: Bird & AqBird
[f] Also included in variables: Bird, AqBird & BirdBEAKS

Table 7.5. Descriptive statistics for various units of analysis for the five general and six specific categories of faunal remains

A. All graves (n = 97)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	3.6	2.2	0.2	0.8	3.1	0.7	1.1	2.4	0.4	0.5	0.4
S.d.	11.9	6.2	0.6	3.9	20.5	2.4	5.4	20.4	1.3	3.2	2.3
Maximum	90	49	5	24	201	18	44	201	8	24	21
Sum	346	210	16	81	302	65	108	237	37	47	34
Ubiquity	39	35	9	10	27	16	10	13	13	4	7

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.1	0.4	0.3	0.1	0.0	0.0	0.0
S.d.	0.5	1.6	1.2	1.0	0.1	0.2	0.1
Maximum	3	12	7	10	1	2	1
Sum	11	34	26	10	1	4	2
Ubiquity	7	9	7	1	1	3	2

B. Phase 1 (n = 72)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	4.4	2.3	0.2	0.8	3.6	0.8	1.2	3.0	0.3	0.3	0.5
S.d.	13.7	6.7	0.7	3.6	23.7	2.8	5.9	23.7	0.9	2.4	2.6
Maximum	90	49	5	22	201	18	44	201	7	20	21
Sum	318	167	11	57	257	56	87	218	18	23	34
Ubiquity	27	24	5	9	17	12	8	6	8	3	7

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.1	0.2	0.2	0.1	0.0	0.0	0.0
S.d.	0.4	0.9	0.9	1.2	0.0	0.2	0.1
Maximum	2	7	7	10	0	1	1
Sum	6	14	12	10	0	2	1
Ubiquity	4	6	4	1	0	2	1

C. Phase 2 (Group 5, n = 10)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	1.1	1.5	0.1	0.0	1.8	0.4	0.2	1.4	0.4	0.0	0.0
S.d.	1.5	2.8	0.3	0.0	3.0	0.8	0.6	2.6	1.0	0.0	0.0
Maximum	5	9	1	0	8	2	2	8	3	0	0
Sum	11	15	1	0	18	4	2	14	4	0	0
Ubiquity	6	4	1	0	5	2	1	4	2	0	0

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.3	0.1	0.1	0.0	0.0	0.2	0.0
S.d.	0.9	0.3	0.3	0.0	0.0	0.6	0.0
Maximum	3	1	1	0	0	2	0
Sum	3	1	1	0	0	2	0
Ubiquity	1	1	1	0	0	1	0

D. Group 1 (n = 23)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	8.6	0.6	0.2	0.9	0.0	1.0	0.3	0.0	0.0	0.9	0.0
S.d.	20.2	1.6	0.6	4.2	0.2	3.7	1.5	0.0	0.0	4.2	0.2
Maximum	90	7	2	20	1	18	7	0	0	20	1
Sum	198	13	4	21	1	22	8	0	0	20	1
Ubiquity	10	5	2	2	1	4	2	0	0	1	1

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S.d.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum	0	0	0	0	0	0	0
Sum	0	0	0	0	0	0	0
Ubiquity	0	0	0	0	0	0	0

E. Group 2 (n = 23)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	3.1	2.0	0.1	0.1	1.3	0.3	1.1	0.6	0.6	0.0	0.1
S.d.	12.5	5.2	0.3	0.3	2.5	1.3	5.0	2.1	1.5	0.0	0.3
Maximum	60	24	1	1	10	6	24	10	7	0	1
Sum	72	47	2	2	29	7	26	13	13	0	2
Ubiquity	7	8	2	2	9	2	2	3	5	0	2

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.1	0.5	0.4	0.4	0.0	0.1	0.0
S.d.	0.5	1.5	1.5	2.1	0.0	0.3	0.0
Maximum	2	7	7	10	0	1	0
Sum	3	11	10	10	0	2	0
Ubiquity	2	4	3	1	0	2	0

F. Group 2–L (n = 3)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	1.0	6.3	0.0	0.0	4.7	1.0	0.0	0.0	0.0	0.0	0.0
S.d.	1.7	5.5	0.0	0.0	8.1	1.7	0.0	0.0	0.0	0.0	0.0
Maximum	3	10	0	0	14	3	0	0	0	0	0
Sum	3	19	0	0	14	3	0	0	0	0	0
Ubiquity	1	2	0	0	1	1	0	0	0	0	0

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S.d.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum	0	0	0	0	0	0	0
Sum	0	0	0	0	0	0	0
Ubiquity	0	0	0	0	0	0	0

G. Group 3 (n = 18)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	2.3	4.6	0.3	1.5	0.7	1.3	2.9	0.2	0.3	0.2	1.3
S.d.	4.4	11.5	1.2	5.2	1.2	3.2	10.3	0.6	0.7	0.5	4.9
Maximum	14	49	5	22	4	13	44	2	2	2	21
Sum	42	83	5	27	12	24	53	4	5	3	24
Ubiquity	7	8	1	4	5	5	4	2	3	2	3

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.2	0.2	0.1	0.0	0.0	0.0	0.0
S.d.	0.5	0.5	0.5	0.0	0.0	0.0	0.0
Maximum	2	2	2	0	0	0	0
Sum	3	3	2	0	0	0	0
Ubiquity	2	2	1	0	0	0	0

H. Group 4 (n = 5)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	0.6	1.0	0.0	1.4	40.2	0.0	0.0	40.2	0.0	0.0	1.4
S.d.	0.9	2.2	0.0	3.1	89.9	0.0	0.0	89.9	0.0	0.0	3.1
Maximum	2	5	0	7	201	0	0	201	0	0	7
Sum	3	5	0	7	201	0	0	201	0	0	7
Ubiquity	2	1	0	1	1	0	0	1	0	0	1

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.2
S.d.	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Maximum	0	0	0	0	0	0	1
Sum	0	0	0	0	0	0	1
Ubiquity	0	0	0	0	0	0	1

I. Intact graves (n = 49)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	3.3	2.2	0.1	1.1	5.1	0.4	1.0	4.6	0.1	0.4	0.7
S.d.	13.2	7.3	0.3	4.3	28.7	1.2	6.3	28.7	0.4	2.9	3.1
Maximum	90	49	2	22	201	6	44	201	2	20	21
Sum	160	109	3	54	249	22	48	227	6	21	33
Ubiquity	19	14	2	7	11	8	3	8	4	2	6

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.1	0.1	0.1	0.0	0.0	0.0	0.0
S.d.	0.3	0.3	0.3	0.0	0.0	0.3	0.1
Maximum	2	2	2	0	0	2	1
Sum	3	4	3	0	0	2	1
Ubiquity	2	3	2	0	0	1	1

J. Reopened graves (n = 43)

Metric	Ungulates	FurTer	FurAq	Fish	Bird	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFish
Mean	3.7	2.2	0.3	0.6	1.2	1.0	1.2	0.2	0.7	0.6	0.0
S.d.	10.5	5.0	0.9	3.7	2.7	3.4	4.6	0.8	1.9	3.7	0.2
Maximum	60	24	5	24	14	18	24	4	8	24	1
Sum	158	94	13	27	52	43	53	10	31	26	1
Ubiquity	19	20	7	3	15	8	6	5	9	2	1

Metric	AqBird_ExBEAKS	BirdBEAKS	AqBirdBEAKS	Mammoth	DogSKEL	Canid	SableSKEL
Mean	0.2	0.7	0.5	0.2	0.0	0.0	0.0
S.d.	0.6	2.3	1.7	1.5	0.2	0.2	0.2
Maximum	3	12	7	10	1	1	1
Sum	8	30	23	10	1	2	1
Ubiquity	5	6	5	1	1	2	1

Table 7.6. Mean quantities of main categories of grave goods in relevant units of analysis for Shamanka II. * Phase 2 = Group 5

Unit [graves]	Total	B&A	CTW	Fish	Knives	4-Main	Orn. all	5-Main	Mass orn.	Non-mass orn.
Cemetery [97]	135.3	3.1	3.5	3.9	0.9	11.5	92.3	103.7	90.8	1.4
Phase 1 [72]	99.0	3.6	3.6	4.7	0.8	12.6	53.8	66.4	52.5	1.3
Phase 2 [10] *	381.6	2.0	2.3	1.4	0.7	6.4	352.2	358.6	351.6	0.6
Group 1 [23]	61.2	2.3	2.0	2.1	0.8	7.2	23.2	30.4	22.7	0.5
Group 2 [23]	52.4	3.0	4.6	3.4	0.7	11.7	17.8	29.5	15.7	2.0
Group 2–L [3]	776.0	12.3	13.7	6.7	1.0	33.7	655.3	689.0	655.0	0.3
Group 3 [18]	113.1	5.4	3.4	10.3	0.9	20.1	50.4	70.4	48.6	1.8
Group 4 [5]	30.0	0.6	1.0	0.2	0.4	2.2	11.8	14.0	11.8	0.0

Table 7.7. Ubiquity counts (n) and rates (%) for five main categories of faunal remains in Phase 1 Intact graves. Note: “0” values have been removed

Unit of analysis	Graves	Burials	Ungulates	FurTer	FurAq	Fish	Bird	Sum	Sum/ Graves	Sum/ Burials	Ungulates	FurTer	FurAq	Fish	Bird
Cemetery	49	65	19	14	2	7	11	53	1.08	0.82	39%	29%	4%	14%	22%
Phase 1	41	56	15	11	1	7	8	42	1.02	0.75	37%	27%	2%	17%	20%
Group 1	12	12	5	2	1	2		10	0.83	0.83	42%	17%	8%	17%	
Group 2	13	22	5	3		1	3	12	0.92	0.55	38%	23%		8%	23%
Group 2–L	3	4	1	2			1	4	1.33	1.00	33%	67%			33%
Group 3	9	14	3	3		3	3	12	1.33	0.86	33%	33%		33%	33%
Group 4	4	4	1	1		1	1	4	1.00	1.00	25%	25%		25%	25%
Total	41	56	15	11	1	7	8	42	1.02	0.75	37%	27%	2%	17%	20%
1 Adult burial	25	25	7	7	1	3	3	21	0.84	0.84	28%	28%	4%	12%	12%
2 Adult burials	4	8	3	2		2	2	9	2.25	1.13	75%	50%		50%	50%
Total	29	33	10	9	1	5	5	30	1.03	0.91	34%	31%	3%	17%	17%
Child graves	4	4	1					1	0.25	0.25	25%				
Female graves	8	9	3	1		3		7	0.88	0.78	38%	13%		38%	
Male graves	22	26	7	9	1	4	6	27	1.23	1.04	32%	41%	5%	18%	27%
Total	34	39	11	10	1	7	6	35	1.03	0.90	32%	29%	3%	21%	18%

Table 7.7. Continued

Unit of analysis	Graves	Burials	Ungulates	FurTer	FurAq	Fish	Bird	Sum	Sum/ Graves	Sum/ Burials	Ungulates	FurTer	FurAq	Fish	Bird
Row graves	28	38	11	7	1	3	4	26	0.93	0.68	39%	25%	4%	11%	14%
Scattered graves	13	18	4	4		4	4	16	1.23	0.89	31%	31%		31%	31%
Total	41	56	15	11	1	7	8	42	1.02	0.75	37%	27%	2%	17%	20%
Row A	1	1	1					1	1.00	1.00	100%				
Row C	2	2	2			1		3	1.50	1.50	100%			50%	
Row D	4	4		1		1		2	0.50	0.50		25%		25%	
Row E	4	9	1				1	2	0.50	0.22	25%				25%
Row F	4	6	1	2		1	2	6	1.50	1.00	25%	50%		25%	50%
Row G	3	4	1					1	0.33	0.25	33%				
Row H	2	3	2	1				3	1.50	1.00	100%	50%			
Row J	3	3	1	1				2	0.67	0.67	33%	33%			
Row K	2	2	1		1			2	1.00	1.00	50%		50%		
Row L	3	4	1	2			1	4	1.33	1.00	33%	67%			33%
Total	28	38	11	7	1	3	4	26	0.93	0.68	39%	25%	4%	11%	14%

Table 7.8. Ubiquity counts (n) and rates (%) for five main categories of faunal remains in Phase 2 Intact graves. Note: most "0" values have been removed

Unit of analysis	Graves	Burials	Ungulates	FurTer	FurAq	Fish	Bird	Sum	Sum/ Graves	Sum/ Burials	Ungulates	FurTer	FurAq	Fish	Bird
Cemetery	49	65	19	14	2	7	11	53	1.08	0.82	39%	29%	4%	14%	22%
Phase 2 (Group 5)	7	8	4	3	1		3	11	1.57	1.38	57%	43%	14%	0%	43%
1 Adult burial	4	4	3	3	1		1	8	2.00	2.00	75%	75%	25%		25%
2 Adult burials	1	2	1					1	1.00	0.50	100%				
Total	5	6	4	3	1		1	9	1.80	1.50	80%	60%	20%	0%	20%
Child graves	1	1					1	1	1.00	1.00					100%
Female graves	2	2	2	2	1		1	6	3.00	3.00	100%	100%	50%		50%
Male graves	4	5	2	1			1	4	1.00	0.80	50%	25%			25%
Total	7	8	4	3	1		3	11	1.57	1.38	57%	43%	14%	0%	43%
Row graves	2	3	2	1				3	1.50	1.00	100%	50%			
Scattered graves	5	5	2	2	1		3	8	1.60	1.60	40%	40%	20%		60%
Total	7	8	4	3	1		3	11	1.57	1.38	57%	43%	14%	0%	43%
Row J	1	1	1	1				2	2.00	2.00	100%	100%			
Row M	1	2	1					1	1.00	0.50	100%				
Total	2	3	2	1				3	1.50	1.00	100%	50%	0%	0%	0%

Table 7.9. Ubiquity counts (n) and rates (%) for six specific categories of faunal remains in Phase 1 Intact graves. Note: most “0” values have been removed

Unit of analysis	Graves	Burials	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFISH	Sum	Sum/ Graves	Sum/ Burials
Cemetery	49	65	8	3	8	4	2	6	31	0.63	0.48
Phase 1	41	56	7	2	6	3	2	6	26	0.63	0.46
Group 1	12	12	2				1	1	4	0.33	0.33
Group 2	13	22	2	1	3	1		1	8	0.62	0.36
Group 2–L	3	4	1						1	0.33	0.25
Group 3	9	14	2	1	2	2	1	3	11	1.22	0.79
Group 4	4	4			1			1	2	0.50	0.50
Total	41	56	7	2	6	3	2	6	26	0.63	0.46
1 Adult burial	25	25	3	2	2	1	1	2	11	0.44	0.44
2 Adult burials	4	8	3		2	1	1	2	9	2.25	1.13
Total	29	33	6	2	4	2	2	4	20	0.69	0.61
Child graves	4	4								0.00	0.00
Female graves	8	9	1	1			1	2	5	0.63	0.56
Male graves	22	26	4	1	5	3	1	4	18	0.82	0.69
Total	34	39	5	2	5	3	2	6	23	0.68	0.59

Table 7.9. Continued

Unit of analysis	Graves	Burials	MuskCAN	HareINC	Raptor	AqBird	Sturgeon	OtherFISH	Sum	Sum/ Graves	Sum/ Burials
Row graves	28	38	5	1	3	1	1	2	13	0.46	0.34
Scattered graves	13	18	2	1	3	2	1	4	13	1.00	0.72
Total	41	56	7	2	6	3	2	6	26	0.63	0.46
Row A	1	1								0.00	0.00
Row C	2	2					1		1	0.50	0.50
Row D	4	4						1	1	0.25	0.25
Row E	4	9			1				1	0.25	0.11
Row F	4	6		1	2	1		1	5	1.25	0.83
Row G	3	4	1						1	0.33	0.25
Row H	2	3	1						1	0.50	0.33
Row J	3	3	1						1	0.33	0.33
Row K	2	2	1						1	0.50	0.50
Row L	3	4	1						1	0.33	0.25
Total	28	38	5	1	3	1	1	2	13	0.46	0.34

3.1. Entire assemblage. Descriptive statistics

Domination of the assemblage by Ungulate elements is not particularly surprising as they are more valuable for making a range of tools, weapons, points, utensils, ornaments, and art objects in comparison to the bones of the other four faunal categories (Table 7.5). It is quite reasonable to imagine that Ungulate bones (complete or in fragments) would be carried in tool kit satchels to make utilitarian objects when the need arose. However, by the same logic, the almost equally high NISP and Ubiquity numbers for Terrestrial Fur Animals and Birds are unexpected as their utility would be much below that of Ungulate elements. The rarity of fish remains is explained by their very low utility (not much can be made from fish bones) and their generally low bone density, the latter making them far less resistant to post-depositional attrition.

The descriptive statistics presented in Table 7.5 further support the points made above about the quantitative aspects of this faunal assemblage at the scale of the entire cemetery (97 graves) as well as at the scale of the units presented in the table. With a total NISP of 970, the assemblage is relatively small. With the exception of three categories (Ungulates, Terrestrial Fur, and Birds), Ubiquity rates are very low, and NISPs are low, too. The most common mode for all categories, including the more specific ones, is "1" while standard deviations are frequently rather high. While this suggests that the distribution of the unmodified faunal remains is quite variable across the range of units of analysis (defined on the basis of cultural characteristics), whether this variation is culturally meaningful is an entirely different question. The rest of the analysis, limited to intact graves, attempts to address this matter.

3.2. Five main categories: Ungulates, Terrestrial Fur Animals, Aquatic Fur Animals, Fish, and Birds

Limiting analysis to Intact graves (n = 49), Ubiquity indices for unmodified animal remains representing these five categories are essentially the same as for all 97 graves: present in 19 graves (39%), Ungulates is the most common category, followed by Terrestrial Fur (14, 29%) and Birds (11, 22%), with Fish (7, 14%) and Aquatic Fur (2, 4%) the least common (Table 7.5). Even though the distributions for All Graves and Intact graves appear to be similar, the remainder of the analysis is limited to Intact graves because as the sizes of various units of analysis become smaller, the risk of biases resulting from grave disturbances becomes higher.

Of the 49 Intact graves, 41 represent Phase 1 of cemetery use while 7 are from Phase 2.[56] With such large difference in sample sizes, one would expect — on statistical grounds — that the rare categories (and most categories in this assemblage are quite rare) would be much less common in Phase 2 than in Phase 1. This, however, is not the case. Even though one such rare category — Fish — is entirely absent among Phase 2 graves, the overall Ubiquity rates (per grave and per burial) are still higher than in Phase 1, mostly due to the much higher rates for Terrestrial Fur, Aquatic Fur, and Birds (Table 7.7; Table 7.8).

Due to the small size of the Phase 2 sample, analysis by the remaining cultural variables is limited to Phase 1 graves. It is interesting that of the three relatively large MUAs, it is Group 2, with roughly twice as many burials as in Groups 1 and 3, which displays much lower overall Ubiquity indices (Table 7.7). This may mean that the subsistence activities of Group 2 people were somewhat more specialized relative to Groups 1 and 3.

[56] One intact grave (No. 98) could not be assigned to phase.

Examination by the number of Burials in a grave is limited to graves with adults only. The inclusion of child interments would likely skew the results as children at Shamanka II were interred with grave goods that were quite different relative to adults (Chapters 5 and 6). There are no intact graves with three or more burials at Shamanka II and graves with two adults have much higher Ubiquity indices than graves with one interment (Table 7.7). This suggests that, indeed, faunal remains were part of the original grave good assemblage associated with individual burials. This also implies that Ubiquity rates per burial are more informative than those per grave.

For similar reasons, assessment by Sex Structure is limited to graves with burials of the same sex: Females, Males, or unsexed Children only. Males have a much higher overall Ubiquity rate than Females (1.04 vs 0.78) and Child graves have a very low Ubiquity value (0.25). Male graves have all categories represented in the following order: Terrestrial Fur (41%), Ungulates (32%), Birds (27%), Fish (18%), and Aquatic Fur (5%). Females lack Aquatic Fur and Birds, Ungulates and Fish are represented equally (38%), and Terrestrial Fur (13%) are much less common than in Male graves. In Child graves, unmodified animal remains were found in only one grave (Gr. 95) and Ungulates is the only category represented (Table 7.7).

There are additional differences between graves in Row and Scattered formations and also between individual Rows but it is unclear whether they are meaningful. The differences in grave goods between Rows K and L (with the rare NE–SW orientation), so well documented in Chapter 5, are not visible at the level of unmodified faunal remains.

3.3. Phase 1, six specific categories: Musk-Deer Canines, Hare Incisors, Birds of Prey, Aquatic Birds, Sturgeon, and Other Fish

At the Cemetery level, Musk-Deer Canines and Raptor (i.e., Birds of Prey) are the most common (8, 16%), followed by Other Fish (6, 12%) and Aquatic Birds (4, 8%), while Hare Incisors (3, 6%) and Sturgeon (2, 4%) are the least common (Table 7.9). Together these 6 categories occur 31 times in 49 graves. It is not especially surprising that Musk-Deer Canines are so common as they, perhaps, served both as utilitarian objects (e.g., barbs for composite fishhooks; Gr. 17) and ornaments. More specifically, Musk-Deer Canines would be particularly useful to fit onto devices designed for capturing large fish (Smoliak, 1984: Fig. 3–6, p. 52). That talons of birds of prey were used to make barbs for composite fishhooks (e.g., also Gr. 17 and Gr. 35) accounts for the relatively high Ubiquity of Raptor remains.[57] The low rate of Fish is not surprising for the reasons mentioned earlier.

Since Ubiquity counts in MUAs are very small, the next two distributions to assess are by the number of Burials and grave Sex Structure. Observations made earlier about the distribution of the five main faunal categories by the number of Burials in a grave are fully applicable also to these six more specific categories and no new patterns emerge (Table 7.9).

Obviously, none of the more specific categories have been documented in Child graves but Male (0.69) and Female (0.56) graves look more alike than was the case previously (Table 7.9). Males have all categories represented: Musk-Deer Canines, Raptor, Aquatic Birds, and Other Fish are all about the same (3–5, 14–23%) and Hare Incisors and Sturgeon are rare (1, 5%). Females lack Raptor and Aquatic Birds but Musk-Deer Canines (1, 13%) may be as common as in Male graves (4, 18%), while Hare Incisors

[57] Musk-Deer canines and Raptor talons fashioned into fishhook barbs are part of the grave good assemblage analyzed in Chapter 5, while this chapter examines only unmodified items.

(1, 13%) may be more common. The differences are probably most logically attributed to the much larger sample (almost three times the number) of Male graves and burials (22 and 26, respectively) relative to Female (8 and 9). The main point is that neither Musk-Deer Canines nor Hare Incisors are restricted to one sex but Child graves have neither. The much more uneven distribution of Hare Incisors relative to Musk-Deer Canines across Intact graves (s.d. = 6.3, max. = 44; Table 7.5) suggests that they were used mainly as Mass Ornaments (similar to Red Deer Canines, Bone Pendants, and Beads; Chapter 5) to signify some sort of social persona applicable to adults of either sex but not to children. The much more even distribution of Musk-Deer Canines (s.d. = 1.2, max. = 6) implies a different, perhaps utilitarian, function for these canines as suggested earlier. The notion of the different functions of these two kinds of teeth is further supported by their very different Ubiquity indices: Musk-Deer Canines appear to be about three times as common as Hare Incisors (7 vs 2, Table 7.9).

Graves in both Formations (Rows and Scattered) have a little bit of everything. That the overall Ubiquity indices in Row graves are much lower (0.46 per grave and 0.34 per burial vs 1.00 and 0.72) is the product of the Row formation being dominated by graves and burials of Group 2, which shows low metrics (0.62 and 0.36) while the Scattered formation is dominated by graves and burials of Group 3 with much higher metrics (1.22 and 0.79). It is unclear what the differences between these two MUAs mean.

Baikal sturgeon (*Acipenser baerii*), of the two mentioned earlier the species much more likely represented by the remains recovered in the graves examined here, is a category that deserves separate attention. First, to the best of our knowledge, Shamanka II is the only cemetery in the region where sturgeon remains have been documented.[58] Additionally, the sturgeon's enormous size and the unique nature of its axial skeleton (FishBase.org; Ruban, 2005; Ruban, 2018) need to be considered. This potamodromous fish spawns mainly in the Selenga River, but also in the Barguzin and Upper Angara rivers, and weighs on average about 65 kg with a maximum of ~200 kg and ~2.0 m in length. Due to its size and weight, sturgeon would most likely rank at the very top of all fishes harvestable by the EN hunter–gatherers living on Lake Baikal. While some sturgeon cranial bones ossify, the axial skeleton is mostly cartilaginous, and the fish lacks teeth and scales. Instead of scales, sturgeon has scutes — often diamond shape ganoid scales built of three layers: bone (the inner layer), dentin (middle layer), and ganoine (outer layer). They are arranged into five rows along the length of either side of their body and there are plenty of them on each fish. Sturgeon scutes are likely more durable than its bones. As such, one would expect scutes to preserve well in the Shamanka's matrix conditions.

Sturgeon remains were recorded in four graves (two Intact and two Reopened), and in all cases, the only element represented was the parasphenoid, the largest bone of the ventral cranial skeleton (Hilton et al., 2011: 43).[59] If the entire fish were placed in the graves, one would expect to find also some scutes, but none were discovered in any graves. This may mean that only sturgeon heads were placed with the burials, underscoring the expected high rank of this fish and high value of its meat, which would have been retained by living members of the community. It is puzzling, however, why no other head bones were found together with parasphenoids, as many other head elements also at least partially

[58] Sturgeon remains have been recorded at several Holocene camp sites on the west coast of Lake Baikal (e.g., Sagan-Zaba II, Bugul'deika II, Berloga, Sagan-Nuge, Ulan-Khada, and Baikal'skoe III (Losey and Nomokonova, 2017).

[59] In three shortnose sturgeons (all 65–70-cm-long) examined by Hilton et al., the parasphenoids are ~15 cm long (2011: Fig. 45).

ossify in these fish (Hilton et al., 2011). This may suggest that only the parasphenoids were placed in the graves, though it is difficult to imagine the purpose and meaning assigned to such a practice. Thus, the lack of sturgeon scutes in Shamanka II graves makes sense but the sole presence of parasphenoids is perplexing. Obviously, all finds of sturgeon head bones need to be considered intentional. The puzzling nature of the sturgeon parasphenoids invites an even more detailed examination of the archaeological context of all four graves.

As mentioned, parasphenoid bones were found in two Intact (Gr. 53 and 96) and two Reopened graves (Gr. 59 and 78). Some archaeological information about these graves is presented in Tables 7.10–7.12, while the additional context is provided in detailed grave descriptions (Bazaliiskii et al., 2024). In Grave 53, the parasphenoid was found in a cluster of 109 objects around the heads of two stacked burials: a 20–25-year-old Mail (Burial 53.01) and 50+ year-old Male (Burial 53.02). Although assignment of these grave goods, including the parasphenoid, to a specific individual is not possible, it is useful to mention that the cluster included the following objects: 2 bone shafts for composite tools or weapons, 10 antler harpoons, 4 composite fishhook shanks, 4 inorganic knives/saws, 8 plain needle cases, 5 eagle long bones, 2 sable mandibles, and 2 hawk or eagle talons. In Grave 96, with a 30–35-year-old Female, at least 2 parasphenoids were found among the cluster of 17 objects near the right hand of the burial which also included 2 bone shafts of composite knives or daggers and 1 each of the following: antler harpoon, bird ulna, and feathered needle case. These two spatial arrangements strongly suggest that rather than placing whole fish or fish heads, only sturgeon parasphenoids were deposited in the graves as part of the original assemblages forming these clusters.

Table 7.10. General archaeological information about Shamanka II graves with sturgeon parasphenoid bones. Parasphenoid numbers represent the MNI for each grave

Grave	Condition	Burials	Sex	Cluster	Formation	MUA	Parasphenoids
Gr. 53	Intact	2	2 M	SE	Scattered	Group 3	1
Gr. 59-2	Reopened	1	PF	SE	Scattered	Group 3	5
Gr. 78	Reopened	4	3 F, 1 M	NW	Scattered	Group 3	1
Gr. 96	Intact	1	F	NW	Row C	Group 1	2

Table 7.11. Five main categories of grave goods in Shamanka II graves with sturgeon parasphenoid bones. Note: “0” values have been removed

Grave	Total	B&A	CTW	Fishing	Knives	4-Main	Orn. all	5-Main	Mass orn.	Non-mass orn.
Gr. 53	209	8	9	46	7	70		70		
Gr. 59-2	341	2	3	1	3	9	233	242	233	
Gr. 78	162	15	5	26	1	47	6	53	1	5
Gr. 96	247	1	10	1	4	16	13	29	13	

Table 7.12. Rare categories of grave goods in Shamanka II graves with sturgeon parasphenoid bones. Note: most “0” values have been removed

Unit	ZooArt	NCAll	NCDec	NCFeathered	BearBac
Phase 1 (means)	0.2	0.5	0.1	0.04	0.2
Group 3 (means)	0.2	0.9	0.0	0.0	0.3
Gr. 53		9			
Gr. 59-2	2	4	3		
Gr. 78	4	3			2
Gr. 96		2		1	

Insights from the two disturbed graves are limited, however, still quite useful. Grave 59 contained two individuals on two separate levels: the upper burial was the fully articulated and almost complete skeleton of a 35–39-year-old Male (Burial 59.01) from Phase 2 and the lower burial on the grave floor was the mostly disarticulated and half-complete skeleton of a 15–19-year-old Probable Female (Burial 59.02) dating to Phase 1, thus, the grave was not assigned to a specific MUA. The burials were separated from one another by 5–7 cm of sediment with no archaeological material. For the expedient purpose of this aspect of the analysis, this allows for the treatment of Grave 59 as two separate graves: Grave 59-1 from Phase 2 and Grave 59-2 from Phase 1, and consequently, assigning grave goods to these two graves separately (Table 7.10; Table 7.11; Table 7.12; Table 7.18).[60] All sturgeon parasphenoids were found on the grave floor in association with the young Female (Burial 59.02), as part of a grave good assemblage consisting of 341 objects including such items as 1 antler arrowhead, 1 shaft of a composite insert tool and 2 insert blades, 1 composite fishhook shank, 228 marmot incisors, 5 red deer canine pendants, 1 plain and 3 decorated needle cases, 2 antler spoons with handles shaped into moose heads, and 1 sable skeleton. In Grave 78, heavily disturbed with a minimum of four very incomplete and fully disarticulated adult interments, the parasphenoid was collected from the grave pit bottom, thus, association with a specific individual is lacking.

Based on this, it is possible to make the following observations. All finds of sturgeon parasphenoids date to Phase 1 and associate with adult burials of both sexes. All come from the North Sector with three graves Scattered and one in the Row formation. Of the MUAs identified within the North Sector, Group 1 is represented by 1 grave, Group 3 by 3 graves, and Groups 2 and Group 2–L are not represented.[61] All four graves feature grave good assemblages that stand out, one way or the other, from the rest of the graves within their units of analysis (i.e., MUAs and Phase 1; Table 7.6; Table 7.11). Graves 53, 78, and 96 have much higher numbers of the four utilitarian categories than the averages while Grave 59-2 has a much higher number of Mass Ornaments, of which 228 are Marmot Incisors, a site maximum for Shamanka II.

Moreover, these graves also have several of the generally very rare categories of grave goods, sometimes in relatively high numbers (Table 7.12). Grave 53 has 9 Needle Cases (all plain) and Grave 59-2 has 2 objects of Zoomorphic Art (2 antler spoons with handles shaped into a moose head, 1 stylized and 1 more realistic, Fig. 6.4.D–E), 4 Needle Cases (3 of which are decorated), as well as 2 Bird Beaks and a Sable Skeleton (Table 7.15; Table 7.18). Grave 78 has 4 objects of Zoomorphic Art (moosehead pendants, Fig. 6.5.C–D; unique at the cemetery), 3 Needle Cases, and 2 Bear Bacula. Lastly, Grave 96 has 2 Needle Cases of which 1 is of the Feathered kind, probably signifying a special kind of social persona as suggested in Chapter 6.

Not much can be said about the distribution of Other Fish remains. However, potentially meaningful is that pike, also a large fish (second only to sturgeon in size), was recorded in Grave 53, together with the sturgeon parasphenoid.

[60] Graves 59-1 and 59-2 are not included in the tables presenting quantitative data for all other aspects of the analysis.

[61] Since Burial 59.02 was interred during Phase 1, for the purpose of this analysis, Grave 59-2 can be assigned to Group 3.

3.4. Phase 1 & 2: Bird Beaks

Bird beaks attract attention for a number of reasons (Table 7.13). First, to the best of our knowledge, bird beaks are quite rare at Middle Holocene hunter-gatherer cemeteries in the region; however, admittedly, faunal remains from only several sites have been examined systematically. Second, the assemblage is quite variable taxonomically, thus also morphologically, and includes such birds as swan goose, merganser, loon, cormorant, bittern (all aquatic birds), as well as Eurasian and Demoiselle cranes, but no raptor beaks although their postcranial remains are relatively common (Table 7.5). Third, out of 17 beaks (Table 7.13), only 7 have both the top (premaxillary) and bottom (dentary) portions, while the remaining ones are represented either by the top (n = 7) or the bottom (n = 2) beaks and 1 could not be identified. In sum, it is rather unclear what function these beaks served. Since the assemblage is rather small, all beaks are analyzed together and more specific categories are mentioned only when practical. The category of Aquatic Bird Remains Excluding Beaks is part of the analysis to see whether the distribution of Aquatic Bird Beaks is correlated with the distribution of their other remains.

In all graves excavated at Shamanka II (n = 97), there are 34 Bird Beak fragments representing a total of 17 beaks recorded in 9 graves (Table 7.5; Table 7.13).[62] Phase 1 is represented by 6 graves with 7 beaks (NISP = 14), Phase 2 by 1 grave with 1 beak and Graves 23 and 26 were not assigned to a specific phase because they have burials from both. Dividing this assemblage by grave condition shows a distribution strongly skewed in the direction of Reopened graves which leaves open the possibility that beaks entered the graves accidentally when they were reopened and backfilled (Table 7.14, but see below). However, it still is useful to examine Bird Beaks in the three Intact graves more closely.

As demonstrated in Table 7.15, all Intact graves with Bird Beaks are Scattered, two come from the SE Cluster and one from the S Cluster, both phases of cemetery use are represented, both graves with adult burials had Males, and one grave had a Child; however, it is the size and the structure of the grave good assemblages that make these graves stand out from the rest (Table 7.16). All three graves show quantities of grave goods that are significantly above the averages for the units of analysis they belong to, but it is the structure of these assemblages and the additional details about these three graves that make them stand out even more.

Grave 51, an interment of a 20–25-year-old Male, has one of the most prominent grave good assemblages overall (641 object in total), with 37 Bow & Arrow, 7 Composite Tools & Weapons, 72 Fishing Gear, 2 Knives, 329 Other Mass Ornaments (beads; but no Red Deer Canine pendants), and 2 Non-mass Ornaments (1 split boar tusk and 1 marble pendant). Of these, the quantities of Bow & Arrow, Fishing Gear, and Other Mass Ornaments are maxima for Groups 1, 2, and 3, the three large MUAs from Phase 1. Its assemblage of faunal remains is not particularly large (NISP = 51) but it is dominated by Hare Incisors, their number of 44 a maximum for the entire cemetery. The single beak of a large bird was found in a cluster of 426 objects underneath the upper body of the skeleton.

[62] Bazaliiskii et al., 2024 also mention 1 beak in Grave 11 (Group 3, Reopened with 1 Female and 1 Male burial) and 1 in Grave 64 (Group 5, Reopened, 1 Male and 1 child), which were not examined by L. Fleming and R. Losey. Therefore, these beaks are not included in this analysis.

Table 7.13. Taxonomic variation of Bird Beaks recovered from Shamanka II graves

Grave	Taxon	Common name	NISP	MNI
Gr. 8	Phalacrocorax sp.	Cormorant	6	1
Gr. 8	Gavia stellata	Red-throated loon	1	1
Gr. 18	Gavia stellata	Red-throated loon	2	1
Gr. 23	Grus grus	Eurasian crane	1	1
Gr. 23	Anthropoides virgo	Demoiselle crane	3	1
Gr. 23	Gavia stellata	Red-throated loon	2	1
Gr. 23	Gavia sp.	Loon	3	1
Gr. 23	Botaurus stellaris	Bittern	2	1
Gr. 23	Aves sp.	Bird (large)	1	1
Gr. 26	Mergus serrator	Red-breasted merganser	3	1
Gr. 26	Anser cygnoides	Swan goose	3	1
Gr. 26	Aves sp.	Bird (large)	1	1
Gr. 28	Mergus sp.	Merganser	1	1
Gr. 51	Aves sp.	Bird (large)	1	1
Gr. 53	Gavia stellata	Red-throated loon	2	1
Gr. 62	Mergus merganser	Common merganser	1	1
Gr. 71	Aves sp.	Bird (large)	1	1
	Total		34	17

Table 7.14. Distribution of Bird Beaks by grave condition at Shamanka II.
* Five graves could not be classified for grave condition

Condition	NISP	MNI	No. of graves	Graves Total
Intact	4	3	3	49
Reopened	30	14	6	43
Total	34	17	9	92*

Table 7.15. General archaeological information about Shamanka II Intact graves with Bird Beaks

Grave	Burials	Sex	Cluster	Formation	MUA	Bird Beaks
Gr. 28	1	Child	S	Scattered	Group 5	1
Gr. 51	1	M	SE	Scattered	Group 3	1
Gr. 53	2	2 M	SE	Scattered	Group 3	1

Table 7.16. Main categories of grave goods in Shamanka II Intact graves with Bird Beaks

Grave	Total	4-Main	Mass orn.	Non-mass Orn
Gr. 28	128	3	119	0
Gr. 51	641	118	329	2
Gr. 53	209	70	0	0

Grave 15 with a 25–35-year-old Male from Group 2 can be considered a counterpart to Grave 51 (Group 3) in terms of the abundance and structure of the grave good assemblage. This Male was interred with 232 grave goods, including 10 Bow & Arrow, 39 Composite Tools & Weapons, 37 Fishing Gear, 9 Knives, 7 Other Mass Ornaments (all beads; but no Red Deer Canine pendants), and 1 Non-mass Ornament (moose tooth pendant). Of these, Composite Tools & Weapons and Knives are maxima for Groups 1, 2, and 3. However, the faunal assemblage in this grave consists of only five specimens, none of which are beaks.

The following assemblage of grave goods from Grave 53 with two Males (Burial 53.01, 20–25-year-old; Burial 53.02, 50+ year-old) shall also be considered rich even though it cannot be assigned specifically to one or the other individual because they were interred stacked: a total of 209 grave goods including 8 Bow & Arrow, 9 Composite Tools & Weapons, 46 Fishing Gear, 7 Knives, and no Ornaments with the numbers for Composite Tools & Weapons, Fishing Gear and Knives substantially exceeding Phase 1 and Group 3 averages. A beak from a red-throated loon was found among 13 objects collected from the upper levels of the grave pit. Moreover, this grave also had one sturgeon parasphenoid, as mentioned earlier.

Grave 28 of a 1.5–3-year-old Child from Phase 2 not only has the richest grave goods of all Children at Shamanka II but its structure resembles a below-average male assemblage: 110 Bone Pendants, 9 Red Deer Canine pendants, 3 Knives, and a point made of bear baculum. One merganser duck beak was found in the same cluster of objects as the bear baculum point to the left of the skull. Bone Pendants in Grave 28 are only second in number behind 210 such pendants in Grave 108 with 2 adults and almost twice as many as the next in line (57 Bone Pendants in Gr. 64 with a Male and a Child). Bone Pendants were recorded only in these three graves and all date to Phase 2 (Chapter 5).

The next question to address is whether the distributions of bird beaks and other bird elements are mutually independent. Given the nature of this assemblage (i.e., the low abundance and ubiquity as well as the presence of taxonomically undetermined beaks and other bird elements), the best way to proceed is to focus on Aquatic Birds. The data presented in Table 7.17 indeed suggest that these two distributions might be independent of one another. The only grave with both kinds of elements is the Reopened Grave 23, however, four other graves with Aquatic Bird Beaks also are Reopened (Gr. 8, 18, 26, and 62) but lack any other Aquatic Bird elements. Limiting analysis to Intact graves gives two graves with Aquatic Bird Beaks (Gr. 28 and 53), neither of which have any other Aquatic Bird elements.

Table 7.17. Distribution of Aquatic Bird Beaks vs other Aquatic Bird elements in Shamanka II graves. Numbers for Intact graves are presented in brackets

Graves with Aquatic Bird elements excl. BEAKS	Graves with Aquatic Bird BEAKS		
	Absent	Present	Total
Absent	84 (45)	6 (2)	90 (47)
Present	6 (2)	1 (0)	7 (2)
Total	90 (47)	7 (2)	97 (2)

There is one more pattern that may be meaningful. In Group 3 only Intact graves (Gr. 51 and 53) have beaks, but in Group 2, only Reopened graves (Gr. 8, 18, 62, and 71) have them. This is baffling because if the data from Table 7.14 indicate that many beaks entered the graves from the cultural layer when Reopened graves were backfilled, then they would be expected also to be found in Reopened graves from Group 3 (7 of 18) some of which (e.g., Gr. 4 and 16) are located next to the Reopened graves of Group 2 with beaks (e.g., Gr. 8 and 18; Fig. 3.3). This may actually mean that even in Reopened graves, Bird Beaks are not accidental but were interred intentionally as part of the original grave goods assemblages, as also suggested by their location in Intact Graves 28 and 51. In fact, only 13 bird remains were recovered from the entire cultural layer, none of which were elements of the head. This suggests that all beaks were likely intentional grave inclusions, allowing for the inclusion of Reopened graves in the analysis, which would somewhat enlarge the sample (from three to seven graves). However, excluding bird beaks from disturbed graves ensures that the current results stand on a firmer ground.

3.5. Rare categories: Mammoth ivory, Dog or Sable Skeletons, and Canids

The last group of faunal skeletal remains to analyze includes four very rare categories (Table 7.5): 10 Mammoth ivory fragments in 1 grave (Gr. 18), 4 dog or wolf fragments from 3 graves (Gr. 6, 8, and 62), 1 dog skeleton in 1 grave (Gr. 26), and 2 sable skeletons recorded in 2 graves (Gr. 39 and 59-2), for a total of 7 graves of which 2 are Intact and 5 Reopened (Table 7.18). The sable skeleton in Grave 59-2 was partially complete but since the associated burial (Burial 59.02) was also incomplete and the grave itself was disturbed, it is reasonable to believe that, originally, it was a complete skeleton. Isolated dog and/or wolf skeletal elements, while not particularly numerous, are a few times more abundant in the cultural layer (20 specimens, 4.5% of all identified elements) than they are in all 97 graves combined (4 elements in 3 graves, 0.4%, Table 7.5). This lack of structure makes it impossible to ascertain to what extent the presence of canid individual elements in the graves is accidental or whether their presence in the cultural layer is the result of their removal from Reopened graves. Consequently, it is best to exclude the category of individual Canid elements from further assessment. This reduces analysis to 2 graves with sable skeletons and 1 each with a dog skeleton and pieces of Mammoth ivory for a total of 4 graves, all from Phase 1. Thus, the inferences are limited and cautious.

Of the three graves that could be assigned to a specific MUA, only Grave 18 with fragments of Mammoth ivory (Group 2) has a higher number of Four Main utilitarian categories than the MUA average (32 vs 11.7), though the number of ornaments is lower (1 vs. 17.8) (Table 7.6; Table 7.18). Accepting the notion that Mammoth ivory was a material of high value to the Shamanka II cemetery population from which it was possible to make a range of artifacts, it should associate with burials of prominent individuals. If so, the structure of the Grave 18 assemblage is not surprising and invites comparison with the prominent assemblages at Shamanka II already referenced above (Table 7.19).

Grave 18 is quite similar in this regard to the assemblage associated with the 25−35-year-old Male from Grave 15. Admittedly, Grave 18 is not as rich as Grave 15, but both have numbers of 4-Main utilitarian categories higher than the averages in Group 2 and both have low quantities of ornaments. Moreover, the Male in Grave 15 also had a large shaft of composite tool made of mammoth ivory (Figure 7.2). The analysis of grave goods presented in Chapter 5 demonstrated that prominent members of Group 2 (mostly men although some women too), did not adorn themselves with large numbers of Mass Ornaments. Rather, their prominence was signified by the abundance of utilitarian objects.

In contrast, Mass Ornaments were employed by members of Group 3 to signify, by means of display, the prominence of their social standing. Within this MUA, the structures of the Grave 51 and Grave 59-2 assemblages also have some commonalities. Both have a large number of Mass Ornaments and all four categories of utilitarian objects are represented, although they are much fewer in Grave 59-2. However, the young woman from Grave 59-2 was interred with sturgeon parasphenoids, objects of Zoomorphic Art, and Needle Cases, all absent in Grave 51. This, perhaps, is more than enough to compensate for the lower numbers in the 4-Main categories and to underscore the prominence of this young woman. It is not unreasonable to surmise that the nature of Burial 59.02's prominence was likely of a different kind than that of the young male (only a few years older) from Grave 51.

Table 7.18. Distribution of the rare categories of faunal remains, main categories of grave goods, and general archaeological information about these graves

Grave Fauna	Cluster	Condition	Burials	Sex	Total	4-Main	Mass orn.	Non-mass orn.	Phase	MUA
Gr. 6 Canid fr.	SE	Intact	1	M	945	1	943	0	2	Group 5
Gr. 8 Canid fr.	SE	Reopened	1	M	95	20	11	0	1	Group 2
Gr. 18 Mammoth	SE	Reopened	1	M	90	32	1	0	1	Group 2
Gr. 26 Dog	S	Reopened	4	PF, PM, U–C, U–A	44	1	18	4	1–2	n/a
Gr. 39 Sable	S	Intact	1	M	84	1	59	0	1	Group 4
Gr. 59-2 Sable	SE	Reopened	1	PF	341	9	233	0	1	Group 3
Gr. 62 Canid fr.	SE	Reopened	5	2 PF, U–A, PM, M	52	20	6	1	1	Group 2

Table 7.19. Structure of grave goods assemblages in Graves 15, 18, 51, and 59-2

Grave	Age & Sex	Total	B&A	CTW	Fishing	Knives	4-Main	Mass orn.	Non-mass orn.	MUA
Gr. 15	25−35 y. M	232	10	39	37	9	95	7	1	Group 2
Gr. 18	25−29 y. M	90	12	10	9	1	32	1	0	Group 2
Gr. 51	20−25 y. M	641	37	7	72	2	118	329	2	Group 3
Gr. 59-2	15−19 y. PF	341	2	3	1	3	9	233	0	Group 3

Table 7.20. Sturgeon (*Acipenser sp.*) NISP and MNI

Grave	NISP	MNI
Gr. 53	1	1
Gr. 59-2	24	5
Gr. 78	2	1
Gr. 96	20	2
Total	47	9

Sable Skeletons probably have little to do with the social prominence of the burials associated with them. True, the assemblage in Grave 59-2 is quite prominent but the one in Grave 39, the only other grave at Shamanka II with a Sable Skeleton, emphatically is not (Table 7.18). Moreover, Grave 39 belongs to Group 4, the poorest (by a large margin) of all MUAs in terms of grave goods at Shamanka II. However, to demonstrate this point more convincingly, it would be necessary to analyze the category of Terrestrial Fur Animals in more detail, including splitting it into species-specific groups.

Although excluded from analysis because it comes from a disturbed grave, it is still useful to make a few observations about the Dog Skeleton found in Grave 26, part of Row I in the S Cluster of the cemetery (Fig. 3.2). The grave contained the incomplete, disarticulated, and commingled interments of at least 4 individuals: 2 adults (Probable Female and Probable Male), 1 older Child, and 1 Adolescent (Bazaliiskii et al., 2024). Phase 1 is represented by 1 burial, Phase 2 by 2, 1 individual could not be dated, and the dog dates to Phase 2: OxA-20561, 6432±34 BP, corrected to 6058±73 BP using the Angara/SW Baikal correction equation (Schulting et al., 2014); $\delta^{13}C = -16.0‰$, $\delta^{15}N = 14.0$, C:N = 3.3. The grave goods were very poor, especially considering that the grave housed at least four human burials: 44 items in total including 1 Knife and 22 Ornaments, but no Bow & Arrow, Composite Tools & Weapons, or Fishing items.

Of all the interments in Grave 26, the dog was the most complete and almost fully articulated. Receiving a human-like treatment at death, it was most likely the last burial after which the grave was backfilled and never used again. While known from several other Neolithic and Bronze Age cemeteries in Cis-Baikal (c.f., Losey at al., 2013b), unfortunately, at Shamanka II there are no other dog burials. Thus, its examination in a broader spatio-temporal context is beyond the scope of this chapter.

4. Summary and Conclusions

In summarizing the taxonomic structure of the faunal remains from the Early Neolithic Shamanka II graves, it is useful to note that the assemblage is almost entirely composed of implements and ornaments and there is little indication that many faunal remains were from cuts of meat placed within the graves. Some of the faunal remains are from intentional animal interments, including a dog burial in Grave 26 and the bear skulls found in multiple graves. The meanings and functions of other sets of faunal remains are far less obvious, the sturgeon parasphenoids, unmodified sable remains found in various contexts, and bird beaks carefully cut from the rest of their skulls providing the best examples of such ambiguity.

For the mammal remains, the relative abundances of some taxa are expected, while others are more surprising. For example, the abundance and ubiquity of red and roe deer remains perhaps should be anticipated, as these animals are the dominant ungulates in Cis-Baikal Holocene camp sites (Losey et al., 2014a; Nomokonova, 2011; Nomokonova et al., 2015; Savel'ev et al., 2001). Conversely, the large number of marmot remains at Shamanka II is unexpected given their rarity in camp sites (Masuda et al., 2015). For the same reason, the broad range of bird remains is also somewhat surprising. Given that the stable carbon and nitrogen isotope data from Shamanka II indicate some reliance on aquatic foods, probably predominantly fish and Baikal seal (Chapter 2), the dearth of fish and, particularly, seal remains in the graves is notable. In fact, well over 80% of the Shamanka II faunal assemblage consists of remains of terrestrial mammals. There is

clearly no direct correspondence between human dietary preferences and taxonomic abundances and ubiquity rates at the site.

The Shamanka II fauna is also taxonomically quite rich, with at least 18 mammal, 14 bird, 2 fish, and 1 invertebrate genera represented. This variety of taxa is far greater than that seen in Cis-Baikal's camp sites (Ermolova, 1978; Losey et al., 2008; Losey et al., 2014a; Nomokonova, 2011; Nomokonova et al., 2009; Nomokonova et al., 2015; Savel'ev et al., 2001). To us, this suggests that the region's camp site faunal assemblages primarily represent fauna use at locations that were occupied temporarily and seasonally, while the Shamanka II assemblage provides a broader glimpse of the animals Early Neolithic people utilized throughout the year and even across several generations. Overall, this diversity of animals was clearly being taken from a suite of local environments, including forested areas (moose and sable), steppe-forest (roe and red deer), patches of steppe (marmots), Lake Baikal (seal, sturgeon, and pike), and probably other aquatic environments (waterfowl and freshwater mussel) such as local rivers and marshes, as in the Tunka Valley to the west of Shamanka II.

Examination of the distribution of this material across various units of analysis revealed a number of points that are useful to summarize. Higher ubiquity indices for Phase 2 for the five main faunal categories (i.e., Ungulates, Terrestrial Fur Animals, Aquatic Fur Animals, Fish, and Birds), mostly due to an increase in Birds, may be viewed as related to an expansion of diet breadth among the Kitoi Shamanka II Phase 2 cemetery population relative to Phase 1. Essentially all species within the Terrestrial Fur Animals, Aquatic Fur Animals, and Birds categories could easily be a part of the diet. Given the periodical food shortages documented by the frequent incidence of enamel hypoplasia (e.g., Lieverse et al., 2007; Lieverse, 2010) and, probably related to it, the slower skeletal and dental maturation rates (relative to the LN and EBA hunter-gatherer groups; Osipov et al., 2020; Temple et al., 2021), expansion of the diet breadth makes sense. Consequently, these people probably could not afford to not eat an animal even if it was captured for a different purpose such as for fur, bird plumage or light and hollow bones.[63] This may suggest that the Shamanka II cemetery population was quite "desperate" for food, particularly during Phase 2. It is possible that the approach to coping with food shortages somewhat varied between the groups of people identified at Shamanka II. For example, relative to Groups 1 and 3, the subsistence activities of Group 2 appear somewhat more specialized, focusing on fishing local resources (excluding sturgeon?) and paying much less attention to capturing birds.

Most faunal categories, both general and more specific, are not restricted to one sex, a pattern similar to the distribution of other grave goods and mortuary characteristics analyzed in Chapters 5 and 6. While the Phase 2 sample is too small to analyze in detail, Phase 1 Males have a little bit of everything, Females lack Aquatic Fur and Birds, and Children don't have much at all (1 grave with Ungulates only, Gr. 95). The young child in Grave 28 from Phase 2 has a Bird Beak.

Additionally, this examination suggests that faunal remains do not contribute much to the differences between Rows K and L (the two rows with the unusual NE–SW orientation located at the opposite ends of the cemetery; Fig. 2.1), so well documented in terms of grave goods (Chapter 5). Also, this analysis implies different functions for Musk-Deer Canines and Hare Incisors: utilitarian (fishhooks for large fish) for the former and ornamental for the latter.

Accounting for the presence of sturgeon parasphenoids, found in only four graves, requires further considerations. Catching a sturgeon, by far the biggest fish in the Baikal

[63] Including some of the big birds (e.g., heron), which are quite light with little meat.

region with lots of boneless and fatty meat, was probably highly valued by this cemetery population and it seems that it was recognized by placing this cranial bone in graves. Capturing sturgeon in the lake was probably quire rare, increasing its value, and probably not easy no matter how it was accomplished. For example, if caught accidentally in nets set for smaller fishes, sturgeon could cause serious (and costly) damage.[64] Catching a 100-kg-fish on the lakeshore using an individual capture technique (Lindström, 1996; Smoliak, 1984; Weber, 2020), lifting it out of the water and transporting it to camp would be quite an effort too. Catching sturgeon during spawning runs on the Selenga River would be much easier but the river is quite far from Shamanka (~220 km to the east).

It is reasonable to believe that skill in harvesting prey of high rank, whether terrestrial or aquatic, was valued, and thus prestigious and probably somehow recognized by these people. If we also accept the reasonable proposition that Musk Deer Canines were mainly used in devices for individual capture of large fish (i.e., sturgeon, pike, taimen), then perhaps insights from the distribution of Musk Deer Canines will shed some helpful light on this matter.

At Shamanka II, there are 65 Musk Deer Canines found in 16 graves with a mode of 1 and a maximum of 18 specimens in Grave 83 (Table 7.5A). Two of the 4 graves with sturgeon parasphenoids also have Musk Deer Canines (Gr. 53 and 78, with 2 and 13 items, respectively). The 13 specimens from Grave 78 are the second largest number and together with those from Grave 83, they account for almost one-third of all Musk Deer Canines documented at this cemetery. It is useful to summarize the grave goods found in Grave 83 (Group 1) with one adult male and one probable female and with the highest number of Musk Deer Canines. It consisted of 191 grave goods in total including 20 Bow & Arrow objects, 11 Composite Tools & Weapons, 23 Fishing, and 4 Knives, but only 4 Ornaments. Obviously, the assemblage in Grave 83 is of similar structure and abundance as those from graves with sturgeon parasphenoids (Jessup et al., 2024a).

Perhaps both Musk Deer Canines and sturgeon parasphenoids relate to the practice of harvesting very large fish individually, while the associated prominent grave good assemblages signify skill and success in this activity. Sturgeon parasphenoids are known only from graves of Groups 1 and 3 and are absent in Group 2. This distribution is consistent with the argument derived independently (Weber et al., 2024b) that fishing in Group 2 focused on local resources using mainly methods of mass capture while fishing in Groups 1 and 3 relied more on individual capture, it now seems, targeting very large fish.

While the above reasoning helps explain the apparent association between sturgeon parasphenoids and prominent assemblages of grave goods, accounting for the presence of this very specific cranial element is less straightforward. However, there are a few useful clues to address this matter.

Since no other cranial bones or scutes were found in the four graves with sturgeon parasphenoids, or in any other Kitoi graves at Shamanka II, it appears that only these bones were placed in the graves. Moreover, in the two intact graves (No. 53 and 96), the parasphenoids were clearly a part of tight clusters of utilitarian objects: 109 in Grave 53 and 17 in Grave 96 including fishing objects (Table 7.11, Section 3.3 above). This association clearly suggests the utilitarian function of sturgeon parasphenoids too. The parasphenoid is not only the largest bone in the sturgeon skeleton but also the only one large enough to be of any practical use, a notion further supported by its shape which lends itself to being used, without any additional modification, as a netting shuttle (Fig. 7.9). The illustrated specimen comes from a shortnose sturgeon 91.5 cm long and the bone is

[64] Nets made specifically for sturgeon by the natives of the Lower Amur used a mesh size of about 50 cm and were made of 1 cm-thick lines spun from nettle or hemp (Smoliak, 1984).

~15 cm long, a size entirely sufficient for this purpose. If removed from large specimens of Baikal sturgeon, with an average size of ~2.0 m, the bone would be substantially larger — large enough to be wrapped in cordage of substantial length or gage. Since other materials (wood, bone, antler) would be equally suitable as netting shuttles, the roughly "anthropomorphic" shape of the element, perhaps, was an additional rationale for selecting and preserving this particular bone for this particular use.

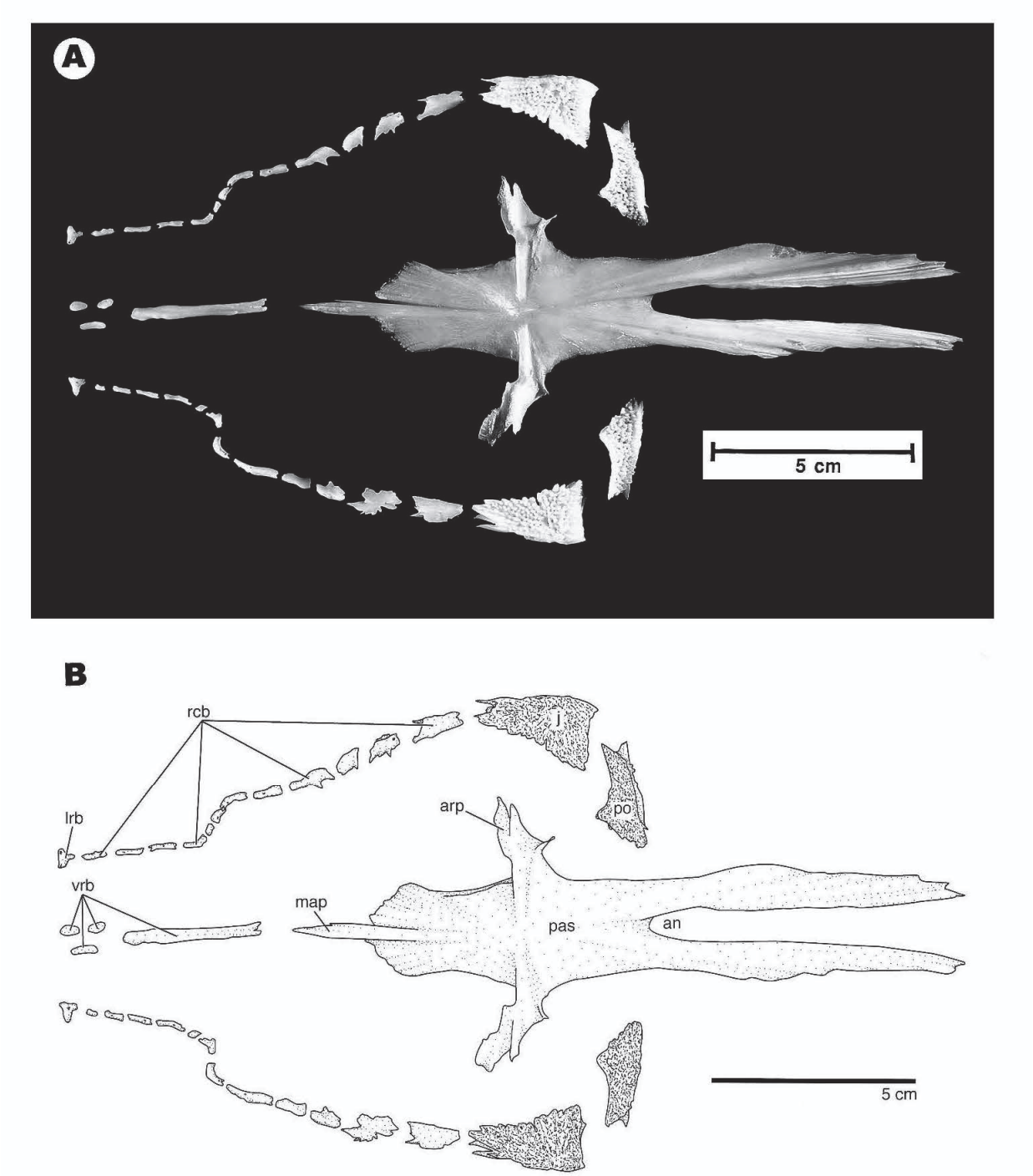


Figure 7.9. Cranial bones in shortnose sturgeon (*Acipenser brevirostrum*), male, 91.5 cm long. After Hilton et al., 2011: Fig. 43

A. Photograph
B. Line drawing (pas = parasphenoid)

Bird Beaks are the last category to summarize. These elements definitely carry some sort of cultural significance but it is hard to suggest something more specific than they are certainly deliberately deposited and tend to associate with prominent assemblages of grave goods. The fact that most beaks are represented only either by top or bottom portions underscores the intentionality of these finds while complicating the matter of their function and cultural significance. The social persona signified by Bird Beaks applies only to Males. The young child in Grave 28 is an exception but its assemblage is of the Male kind (Chapters 5 and 8).

Overall, while the insights reviewed above are quite novel and important, just as importantly, the Shamanka faunal assemblage provides an opportunity to see that animals were fundamentally a vital part of Early Neolithic people's daily practices and identities, including marking status. The recurrent inclusion in the graves of specific elements from a distinct set of species was, in part, pragmatic, as some species' body parts are far better suited to some uses than others. However, it also indicates that meaningful relationships existed here between people and animals that were not just based on an animal's use as a food source. The exact nature of these relationships is often difficult or impossible to ascertain based on archaeological context.

Chapter 8. General significance of Shamanka II for the understanding of the Kitoi cultural pattern

Andrzej W. Weber

The attempt to summarize the mortuary variation documented in this monograph as well as to assess the findings from the perspective of their contribution towards a better understanding of the history of the Kitoi people is challenging not only because of the wealth of data Shamanka II provided but also because of the lack of an adequate comparative frame of reference. This lack concerns not only the Kitoi mortuary pattern in general but applies to other large Kitoi cemeteries individually (e.g., Lokomotiv, Kitoi, and Ust'-Belaia).[65] All summaries by Russian experts, beginning with A.P. Okladnikov (1950) and continuing to this day, cling to the normative typological approach and emphasize uniformity over variation, in stark contrast with this monograph's explicit focus on the latter. Moreover, quantitative data on the Kitoi mortuary pattern presented in the literature are rare and difficult to verify (Bazaliiskii, 2010; Bazaliiskii and Savel'ev, 2008). The study of Shamanka II by Scharlotta et al. (2016) is also of limited use mainly because of the different approach used to define independent and dependent variables, which excluded some characteristics used in this monograph to describe variation at the grave and burial levels, and the way grave goods were selected and grouped for analysis. Consequently, a different tack is taken here in which a frame of reference is provided by the current understanding of the general history of the Kitoi cultural pattern and details made available through a number of archaeological, chronological, and bioarchaeological studies, as reviewed and synthesized recently in three large papers (Bronk Ramsey et al., 2021; Weber, 2020; Weber et al., 2021).[66] The most relevant findings from these summaries are briefly presented below.

The Kitoi cultural pattern was a product of the introduction of the bow and arrow technology, entirely new to the region, at a time when the boreal forests were expanding in response to a progressively warmer and wetter climate (Fig. 8.1). This, in turn, set in motion a number of processes. The efficiency of the new hunting technology created labor surpluses (e.g., a single bowman could be dispatched instead of a group of spear hunters) that could be allocated to other activities (e.g., subsistence, social interactions, or

[65] The lack of comparative data holds true also for most LN and EBA mortuary traditions and cemeteries across the entire Cis-Baikal region, though, obviously, comparison with non-Kitoi materials is beyond the scope of this assessment.

[66] All three papers have been recently translated and published in Russia (Weber, 2023; Weber et al., 2023a; Weber et al., 2023b)

manufacturing mass ornaments) and provided flexibility in terms of group size: from units consisting of individual families to groups composed of several, all potentially functioning equally well at least in terms of subsistence needs. However, bow hunting quickly led to the depletion of game resources (mainly red deer and roe deer) on the shrinking open landscape, a phenomenon probably felt more acutely by larger social units. Fishing grew in importance because of its potential to accommodate the labour surpluses generated by bow hunting and because it was the only resource with the potential to compensate for shortages of, and fluctuations in, supplies of game food. Together, this resulted in a substantial social restructuring of EN groups: some organized themselves into much larger social units, thus providing the collaborative labor required by fishing, particularly by its intensive forms; and some remained relatively small and pursued the less intensive forms of fishing in addition to game hunting with the bow.

Figure 8.1. Kitoi bowman. Artistic reconstruction by N.D. Kasprishina

The Kitoi pattern developed only in those places in Cis-Baikal where fisheries were suitable for intensification (e.g., rich enough and accessible) and where there was still enough open landscape to make game hunting viable not just for food but also in terms of other resources such as hides, sinew, antler, and long bones which were needed in daily life for clothes, shelter, tools, and utensils. Considering the limited number of large and medium game species available in the region (i.e., moose, red deer, roe deer, and boar) and

their variable distribution, their numbers would be an important constraint. This is why the Kitoi cultural pattern formed only on the southwest shores of Lake Baikal, the upper section of the Angara River, and perhaps also on the lower sections of the Angara's large left tributaries (i.e., the Irkut, Kitoi, and Belaia), and never developed elsewhere in Cis-Baikal where the combination of game resources and fisheries was not suitable to support this socioeconomic pattern. In the places most conducive to the intensification of fishing, this led to further population crowding, an increase in socio-economic diversification, and the further depletion of large and medium game.[67] While all Kitoi groups apparently relied to some extent on fishing for food, not all groups engaged equally in the intensification of fishing, and not all groups experienced dietary trends towards an increased reliance on fish: many groups remained relatively stable in this regard.

Regardless of this varied reliance on intensive fishing, the Kitoi pattern eventually collapsed under the combined pressures of a continuously expanding boreal forest and diminishing returns from game hunting. The system collapsed not only because of inadequate provisioning with game food but also because of a shortage of other resources that only game could provide (e.g., hides, sinew, and long bones and antlers for a range of tools and utensils). At this point the only solution to these growing problems was the abandonment of the Kitoi socio-economic pattern and dispersal of Kitoi groups into small units across the expanding taiga, a strategy made possible by the bow which, fortuitously, worked equally well in the forest as on the open landscape and for small groups.

In light of this scenario, Phase 1 at Shamanka II corresponds to the initial formation stages of the Kitoi pattern and its subsequent growth and "peak", while Phase 2 can be viewed as a short-lived and ultimately unsuccessful attempt to reinstate the Kitoi cultural pattern at a time when in most other places it had already ceased to exist. After this final collapse, the Kitoi pattern never returned to Cis-Baikal: the hunter–gatherer strategies of the Middle and Late Neolithic periods, the latter also marked by the use of formal cemeteries, are different from Kitoi in many respects (Weber, 2020; Weber, 2023).

With this background, it is useful to provide an overview of the Kitoi mortuary variation documented at Shamanka II. It is important to keep in mind that the Shamanka II cemetery population represents only an unknown fraction of the entire Kitoi population living around Kultuk Bay, attached to the cemetery through the disposal of their dead and other functions that it may had served. Moreover, the makeup of this fraction very likely varied for each of the MUAs as suggested by their different demographic structures. Therefore, it is necessary not to take each pattern revealed by this examination at face value.

Although, individually, all Shamanka II EN graves unmistakably fit within the Kitoi mortuary pattern as presented at the beginning of Chapter 3, the variation in characteristics examined, many of which (e.g., composite fishhook shanks) are traditionally regarded as diagnostic of the Kitoi mortuary tradition, is staggering.[68] Most aspects of this variation are quantitative in nature rather than qualitative, thus potentially subtle and, consequently, not overtly visible archaeologically without detailed analysis. Moreover, this variation is multidimensional, regarding many vectors such as chronology (Phase 1 vs. Phase 2), sex and age (Females vs. Males vs. Children), grave formations (Row vs. Scattered), and dietary patterns (c.f., Scharlotta et al., 2016).

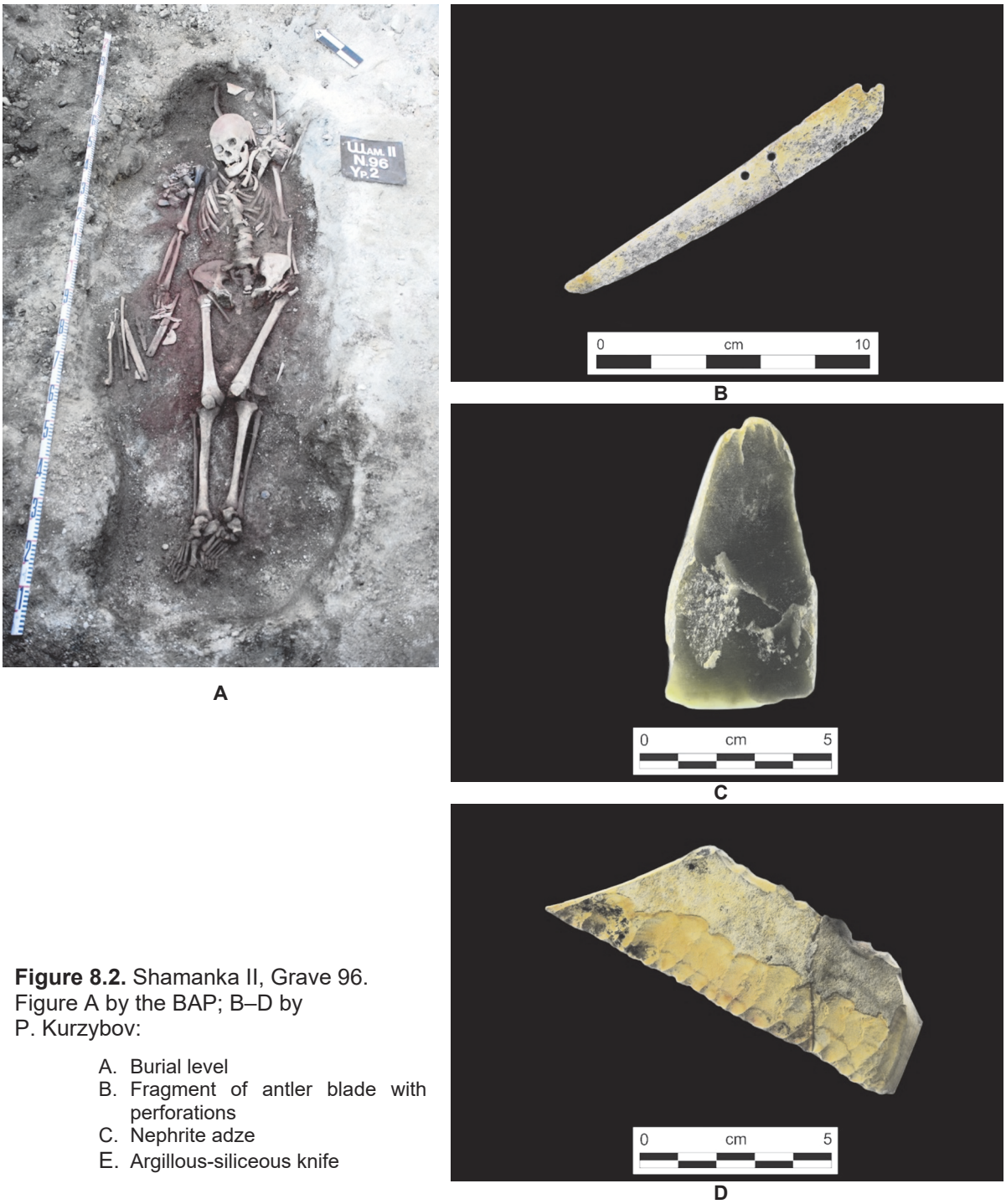
[67] 'Population crowding' is defined as changes in population distribution due to the combined effects of individuals and families forming larger groups and the tendency of such groups to live relatively near to one another, thus leading to higher variability in microregional and regional population densities.
[68] Red ochre, present in almost all graves, is the only exception.

It is generally accepted in mortuary archaeology that individuals of higher social standing associate with more abundant or more diverse grave goods assemblages — which show much variation at Shamanka II — and also more elaborate grave architecture, which does not and therefore is excluded from analysis. It is both useful and interesting to note that at Shamanka II the most prominent Male (e.g., Gr. 15, Fig. 5.11; Gr. 51, Fig. 5.12), Female (e.g., Gr. 73, Fig. 5.5; Gr. 96, Fig. 8.2), and Child (e.g., Gr. 28, Fig. 5.7; Gr. 88, Fig. 8.3; Gr. 92, Fig. 5.6) interments are mostly single (excepting the female and child in Gr. 115, Fig. 5.18). Also, they come from intact graves and the skeletons show high rates of completeness and low rates of disarticulation. In terms of grave goods abundance and diversity, none of the graves with 3–5 burials come anywhere close to the most prominent single or double graves.

Of course, it can be argued that grave goods were removed from these multiple-burials as such graves were frequently reopened and disturbed (i.e., more commonly than graves with single and double interments). However, to counter this argument, a few graves with triple interments are not disturbed and they do not match the "rich" assemblages from single or double graves either. Moreover, the presence of some grave goods (e.g., Zoomorphic Art), suggests that grave inclusions were not commonly removed from reopened graves, as additionally supported by their general lack in the so called "cultural" layer at Shamanka II. The notion that the most prominent members of the Shamanka II cemetery population were meant not to be disturbed in the afterlife by the surviving members of the Kitoi community in this area is persuasive.

That graves with 3–5 burials are different in terms of mortuary ritual from graves with 1–2 interments is supported by a few additional points. As observed, they were more frequently reopened and, therefore, the skeletons show characteristically much lower rates of completeness and higher rates of disarticulation. Moreover, both Ash Pits and Bear Crania are more common in graves with 3–5 burials even though the numbers of such graves are progressively smaller (6, 5, and 3, respectively; Table 4.3). It may follow then, that the configuration of Ash Pits, Bear Crania (more generally bear rituals), and grave reopening, likely had some very specific cultural significance which, for some reason, was more commonly expressed in graves with more than two burials (c.f., Chapters 6 and 7; Losey et al., 2013a). Or, in other words, that individuals to whom this cultural meaning and mortuary ritual was applicable were more commonly interred in graves with 3–5 burials. Graves with three or more individuals are known from other Kitoi cemeteries (i.e., Lokomotiv, Kitoi, and Ust'-Belaia) but, as mentioned, Ash Pits and Bear Crania are not. Why this very particular configuration is so conspicuous at Shamanka II, while many other aspects of the mortuary ritual show continuities with the other Kitoi cemeteries, is a good question to ponder in a dedicated study.

Based on the distribution of grave goods relating to the Bow & Arrow, it seems that the use of this new technology was dominated by males, though not exclusively restricted to them. Likewise, it seems that leadership in the effort to intensify fishing, which was not new, was also provided by males, though the labour supplied by females and children was valued and necessary to accomplish this collaborative task. This is suggested by the large number of individual Male graves with rich grave goods, the lack of Female and Child counterparts, and the practice of interring females and children mostly in graves with multiple burials, all characterizing Group 2 — to which the practice of fishing intensification is perhaps most applicable.



A

B

C

D

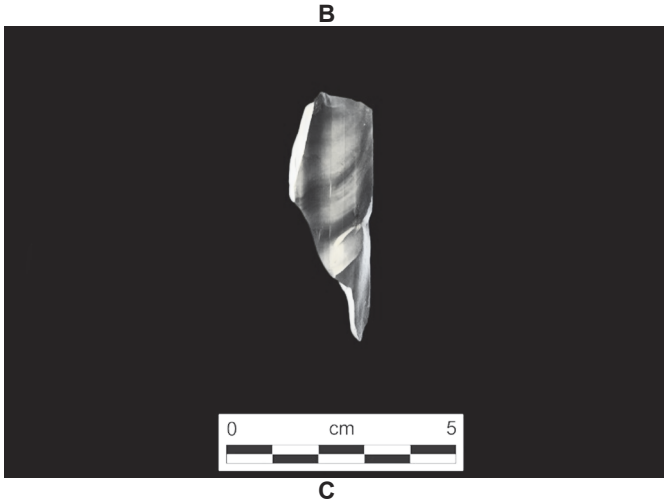
Figure 8.2. Shamanka II, Grave 96. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Fragment of antler blade with perforations
C. Nephrite adze
E. Argillous-siliceous knife

The low prevalence and quantity of Fishing Gear across all analyzed units is not inconsistent with an argument for the importance and intensification of fishing, as intensification is best accomplished through the use of mass capture techniques, the tools of which are unlikely to be interred in graves. Nets, weirs and traps of different kinds are more likely to be a subject of group (rather than individual) ownership and, besides, are impractical as grave goods and costly to be taken out of daily use. It is, rather, items related to individual capture techniques used in non-intensive fishing (e.g., single fishhook lines, harpoons, leisters, and musk deer canines) that are more likely to be owned individually and thus more likely to be interred with the dead. Therefore, the grave goods only suggest that non-intensive methods of fish capture were practiced by these people in addition to intensive techniques which, of course, makes sense.

A

B



C

D

Figure 8.3. Shamanka II, Grave 88. Figure A by the BAP; B–D by P. Kurzybov:

A. Burial level
B. Small retouched flake of light banded quartz
C. Fragment of grey banded hornfels tablet with negatives of removed flakes
F. Composite tool (weapon)

The high status and leadership roles of males, as indicated by rich grave goods assemblages, are obvious across the various groups using the Shamanka II cemetery throughout its duration. However, rare instances of Female graves with grave goods assemblages akin to those of males suggest that females sometimes functioned on equal terms with males as prominent members of social units organized around the needs of collaborative fishing (Groups 1 and 3). The recognition of contributions to collaborative fishing provided by children is also visible in the archaeological record, consistent with the notion that every extra pair of hands helps. In addition to disposing of their dead, each MUA appears to have used the cemetery somewhat differently, suggesting that the additional non-mortuary goals in each case could have been somewhat different.

The structure and abundance of a few assemblages of grave goods brings up the matter of social differentiation among the Shamanka II cemetery population and the Kitoi population more broadly. More specifically, this regards the following three graves: Grave 28 with 1.5–3-year-old child, Grave 59-2 with a 15–19-year-old probable female, and Grave 73 with a 16–18-year-old female; all highlighted in the monograph already on a few occasions (Chapters 5–7). The two young females were both interred with middle-range male-like grave goods that mark them as the most prominent female assemblages across the entire cemetery and, additionally, Burial 59.02 had the highest number of sturgeon parasphenoids, an item that even the most prominent male burials lack (e.g., Gr. 15 and 51). The child in Grave 28 was accompanied by the second highest number of Bone Pendants and the rare find of a Bird Beak (belonging to a merganser), a category otherwise restricted to adult males. Two other interments of older children also fit into this group of burials: Burial 88 (6–8 years old) and Burial 92 (10–12 years old) had unusually high numbers of Composite Tools & Weapons for this demographic: 10 and 6, respectively. Both firmly date to the first half of Phase 1 (Table S.2).

This configuration of mortuary characteristics may suggest the development (already during the first half of Phase 1) of incipient conditions for ascribed (i.e., inherited) status among the Kitoi groups represented by the Shamanka II cemetery population.[69] These conditions are termed "incipient" for a few reasons. First, the number of such interments is still rather low. Second, the two female interments have grave good assemblages that are still much below the prominent (and especially the most prominent) male assemblages both in structure and abundance. And third, the prominence of the three child assemblages is based on a very limited number of grave good categories with abundances also much below the most prominent males. Since similar child graves have also been documented at Lokomotiv (V.I. Bazaliiskii, personal communication), the largest Kitoi cemetery (located at the confluence of the Irkut and Angara rivers; Fig. 1.1), it is reasonable to believe that equally incipient forms of ascribed status functioned across the entire Kitoi population. Obviously, these social conditions did not develop into more pronounced forms of social inequality and ascribed status as the Kitoi evolutionary trajectory was truncated by a rather sudden collapse of this cultural pattern.

This brings us to more specific matters and it is perhaps most practical to begin this review with Group 2 and present it as a benchmark for comparison with the other social units identified at Shamanka II. The mortuary record indicates that Group 2 consisted of people with a strong sense of cultural identity, connection with their ancestors and cohesive social fabric, with all members fully committed to the subsistence strategy providing the mainstay of their livelihood — a combination of game hunting and collaborative fishing — for the good of the entire group. The lives of these people centered on the area around the cemetery, perhaps even with some sense of ownership of nearby terrestrial and aquatic resources. This group was led by males who used Non-mass Ornaments (e.g., boar tusk pendants, animal tooth or shell pendants, organic or lithic rings, feathered "needle" cases, and bear bacula) rather than Mass-Ornaments (red deer canine pendants, marmot and hare incisors, and incisors and pyrophyllite beads) to demonstrate their social role or status. It appears that their relatively uniform status derived less from success in game hunting with the bow and arrow and more from their leadership in collaborative fishing in the shallows of Kultuk Bay. Some males garnered more prominence than the rest, as reflected in the large number of grave goods (e.g., Gr. 15 with

[69] Burial 73 dates to the beginning of Phase 1, Burial 59.02 to the second half of Phase 1, Burial 28 is Phase 2 (Table S.2).

the site maximum for Composite Tools & Weapons and Knives and Gr. 22, Fig. 5.15, with the site maximum for Non-mass Ornaments). No single Female or Child was interred with grave goods similar to an "average" male assemblage. Thus, in this social unit, females and children, in addition to their other roles, were perhaps also valued (to a large extent as were the males) for their contribution, real or potential, towards these collaborative efforts. The emphasis on collaborative (intensive) fishing could have been particularly important once diminishing returns in game hunting became more menacing (Scharlotta et al., 2016).

Group 3 appears similar to Group 2 in some ways and different in others. Similarities include a high number of graves with multiple burials, the prevalence of grave reopening events, the presence of secondary burials, the diversity of grave goods, the presence of one prominent Male burial (Gr. 51 in Group 3 and Gr. 15 in Group 2), the presence of Ash Pits, and Bear Bacula and Crania, as well as the spatial proximity within the SE Cluster. Differences in Group 3, on the other hand, regard the higher proportion of Female relative to Male graves and burials; the higher proportion of Child graves; the more abundant but less equitable Male grave good assemblages with the maxima for Bow & Arrow, Fishing Gear, Red Deer Canine Pendants, and Other Mass Ornaments; a much higher prevalence of Bow & Arrow grave goods; and, perhaps — because quantities are low — the absence of Feathered Needle Cases. The structures of the grave good assemblages for the most prominent Male burials also differ between the two groups: Grave 51 has the cemetery maxima for Bow & Arrow and Fishing Gear while Grave 15, as mentioned, holds the maxima for Composite Tools & Weapons and Knives. The young female from Grave 73 (Group 3) has a grave good assemblage generally comparable to those of males in Group 3 both in structure (Composite Tools & Weapons, Fishing Gear and Non-mass Ornaments) and quantity, though with far fewer items than the most prominent male assemblages. The assemblage of grave goods associated with another young female from Grave 59-2 is also male-like in structure and quantity and, additionally, includes the highest number of sturgeon parasphenoids. Aside from mortuary characteristics, both groups experienced a trend towards an increased dietary reliance on local fish, however, using different techniques: Group 2 emphasizing methods of mass capture and Group 3 emphasizing individual capture techniques, resulting in a somewhat different species structure of each catch (Chapter 2; Weber et al., 2016a; Weber et al., 2016b; Weber et al., 2021).

It is possible that these two groups formed a broader social unit, separated in life mostly by their approaches to fishing and in the afterlife by the spatial arrangement of their graves. Common participation in a range of mortuary rituals was centered on the SE Cluster; an exchange of marriage partners as well as other forms of collaboration and competition could all have been part of these interactions. A degree of rivalry, whether in subsistence activities or other aspects of life, is suggested by the fact that most maxima of grave goods are evenly shared between Group 2 (Composite Tools & Weapons, Knives, and Non-mass Ornaments) and Group 3 (Bow & Arrow, Fishing Gear, and Red Deer Canine Pendants). The maximum for Other Mass-Ornaments, however, belongs to Grave 112 with a Female and Child from Group 2–L (Fig. 5.10).[70]

The people of Group 1 could also be local but were clearly not organized into an intensive fishing cooperative in the manner of Group 2. Likely, their fishing emphasized non-intensive techniques easily practiced individually, somewhat similar to Group 3 and the opposite of Group 2. Since collaborative fishing was less important, the status of males likely derived more from game hunting or some other aspects of their lives such as

[70] The maximum for Bone Pendants belongs to Group 5 but this item is restricted to Phase 2.

knowledge and experience, access to exchange networks, etc. Unlike Group 3, however, Group 1's hunting seems not to have been particularly successful, as suggested by the complete absence of Red Deer Canine Pendants and Non-Mass Ornaments, the relatively low prevalence of Bow & Arrow, and the low quantitative metrics for the other utilitarian grave goods. Bear Bacula are absent in Group 1 too. However, these individuals still adorned themselves with Other Mass Ornaments (pyrophyllite beads and marmot incisors) in numbers similar to Group 3 and higher than in Group 2 (Table 5.1).

It is unclear why Group 1 has such a high proportion of Female and particularly Child graves. Additionally, one of these Female (Gr. 96) and two Child (Gr. 88 and 92) graves have unusually high numbers of Composite Tools & Weapons. In this regard, all three graves fit better with Male graves than with their own demographics. Perhaps it is the greater emphasis on individual forms of subsistence activities (i.e., non-intensive fishing, bow hunting, and other forms of food procurement) that these numbers — and the large number of graves with single interments — reference. Group 1 also consists of graves from two clusters (NW and S) and from rows with two different orientations and thus could include separate smaller social units. Therefore, in social terms, Group 1 probably was more heterogeneous than Groups 2 and 3 and may represent families pursuing generally similar subsistence strategies somewhat independently of one another, some perhaps with hunting ranges further away from the shores of Lake Baikal. This would explain why, when combined, these families do not show a dietary trend, a characteristic present in the more homogeneous and cohesive social units represented by Groups 2 and 3.

Not much can be said about Groups 2–L and 4 except for a few observations. Group 2–L (Row L from the SE Cluster consisting of three graves with five burials) stands out for three reasons. First, the three graves together feature the richest grave goods assemblage at Shamanka II, dominated by Mass Ornaments. One male (Gr. 116, Fig. 5.19) was buried with two bows, another (Gr. 112) with the site maximum of Mass Ornaments, and the double interment of a Female and Child (Gr. 115) is also very rich for this demographic configuration. Second, the richness of grave goods in Row L is in stark contrast to that of Row K, the only other row at Shamanka II with the same orientation. And third, these two rows are as far away from one another as the boundaries of the cemetery allow, a layout without an identifiable meaning at this time but almost certainly not accidental.

While of the three larger Phase 1 units of analysis, Group 1 is much poorer in terms of grave goods than either Group 2 or Group 3, Group 4 (consisting of burials from scattered graves within the S Cluster) appears to be a uniformly poorer version of Group 1. Admittedly, the sample is perhaps too small (five graves with seven burials) to see any systematic differences, particularly if they are mainly quantitative in nature as most of the differences at Shamanka II are. Nonetheless, some of the metrics seem to be useful to demonstrate this. Group 4 shows by far the lowest mean and standard deviation for the five main categories of grave goods together and for each separately. Moreover, Red Deer Canine Pendants, Non-mass Ornaments, Ash Pits, Zoomorphic Art, Needle Cases (of all three kinds), and Bear Crania are entirely absent and, obviously, there are no grave goods maxima (Table 5.1).

Group 4 was identified based on the same spatial criterion that distinguished Group 3 (scattered graves) from Group 2 (row graves) in the SE Cluster and it seems to work equally well in the S Cluster. Perhaps Group 4 represents social units operating somewhat on the fringes of the activities in which the members of the other Phase 1 groups were involved. In this context, it is useful to mention the female (Burial 42.02) whose

unique isotopic signal indicates she spent much of her adult life elsewhere but moved to the Kultuk Bay area just before her death and subsequent burial at Shamanka II (Schulting et al., 2025; Weber et al., 2016a; Weber et al., 2016b).[71, 72] Although this woman appears to be the only individual from the cemetery population with such a life history pattern, the fact that she was interred in one of the scattered graves of the S Cluster may not be accidental. Based on the paucity of grave goods, it is not unlikely that the members of this group were not particularly successful in either game hunting or fishing and perhaps occupied the lower levels of the social hierarchy in terms of status, prestige, economic success, and overall wellbeing. It is this relative "poverty" that makes Group 4 stand out from the rest and it would be useful for future work to address this matter in more detail.

The last to review is Group 5, the only unit of analysis representing Phase 2. Its defining mortuary characteristics have been mentioned throughout this monograph but it will be useful now to present them together. The dietary trend of this group repeats the trend identified for Group 2 (increased reliance on local fishes), only isotopically even more clear and statistically even stronger, in addition to unfolding much faster and over a shorter span. This replication of the earlier dietary trend probably also indicates a replication, at least in general terms, of the earlier socio-economic pattern. However, Group 5 lacks a spatial identity: its graves and burials were added to all three spatial clusters established during Phase 1, in some cases adding to or completing existing rows, including Row K (with the rare NE–SW orientation) which has one Phase 2 burial. None of the new Phase 2 graves have more than two burials and in several instances Phase 2 burials — typically only one — were added to Phase 1 graves, some of which already had more than two burials. As with most other groups, Group 5 is dominated by Male graves and burials. The assemblage of grave goods in Group 5 is best summarized as an "impoverished" but "embellished" version of the Group 2 assemblage: a similar assortment but lower quantities of utilitarian categories and Non-mass Ornaments paired with a much higher quantity of Mass-Ornaments including Bone Pendants and probably the more common use of such socially significant items as Bear Bacula and Feathered Needle Cases. Bone Pendants, recorded in only five graves (three in the SE Cluster and two in S Cluster) are the only grave goods category exclusively restricted to Phase 2.

The lack of spatial identity for Phase 2 burials, (i.e., their integration with the Phase 1 spatial structure) is obviously deliberate, though its cultural significance is unclear and it may mean a few things. First, despite a break in cemetery use lasting perhaps as longs as a few hundred years, the graves of Phase 1 were likely still sufficiently visible on the surface to guide their intentional reopening to add new interments or the excavation of new graves without disturbing older ones.[73] Second, it was apparently more important for these people to emphasize continuity with all groups that used the cemetery during Phase 1 than to establish their own spatial cluster, a choice which would have probably referenced the social cohesion of Phase 2 group. However, if these families operated somewhat independently of one another, similarly to the families comprising Group 1, it is natural to

[71] Grave 42 with two burials is excluded from the grave level and grave goods analyses because one burial (Burial 42.01) belongs to Phase 2 while the other (Burial 42.02) was interred during Phase 1 (Jessup et al., 2024a; Jessup et al., 2024c). Thus, the grave belongs to a small group of graves chronologically classified as Phase 1–Phase 2 and is not part of any MUA, though the individual burials belong to MUA at the burial level (Groups 5 and 4, respectively). Since the two burials are separated from one another by a layer of sediment, it might possible to treat these two components, and all other similar cases at Shamanka II, as two separate graves and include both in the grave level and grave goods analyses in the same manner as was done for Grave 59 in Chapter 7.

[72] See the Addendum for the summary of radiocarbon dating and stable isotope analyses of this individual.

[73] Grave 33 from Phase 1, cut by Grave 30 from Phase 2, is an exception (Fig. 8.4).

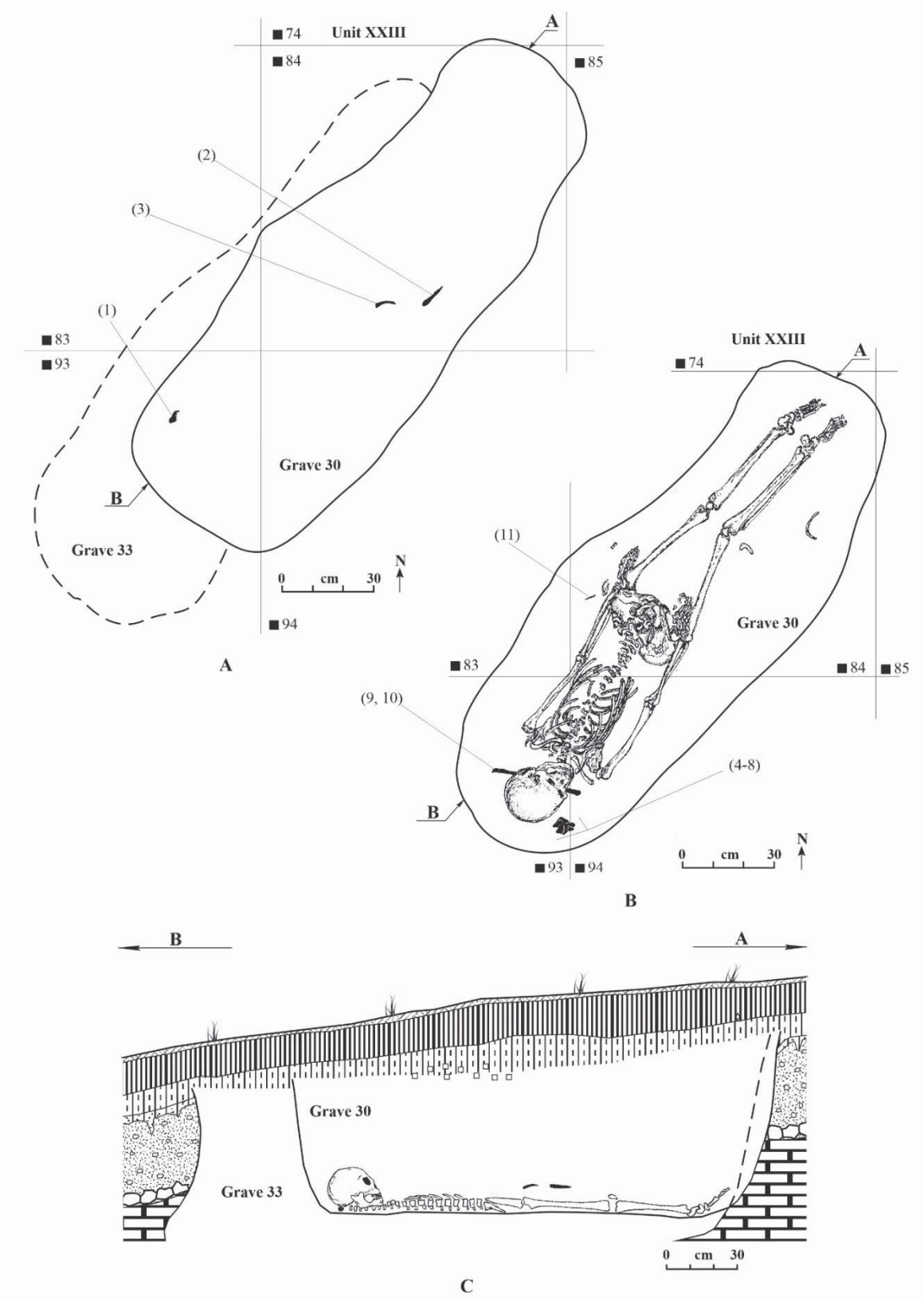


Figure 8.4. Shamanka II, Grave 30 and Grave 33: Grave 30 (Phase 2) intersects Grave 33 (Phase 1). Figure by N.D. Kasprishina, A.A. Tiutrin and V.I. Bazaliiskii:

A. Floor plan
B. Floor plan
C. Longitudinal-section

ask why they fit so neatly into the dietary trend of Group 2. To the contrary, they could not be as independent socio-economically as the spatial locations of their graves suggest. Rather, they were organized approximately on the same principles as Groups 2 and 3 (perhaps as a necessity for survival), however, separated upon death for yet different reasons — perhaps the strength of ancestral connections. This underscores again the earlier observation that each group used Shamanka II somewhat differently.

The structure of the Group 5 grave goods suggests that game hunting was not particularly successful and is consistent with the notion that, repeating the subsistence pattern from Phase 1 (seen most strongly in Group 2), these people quickly depleted the somewhat recovered game stocks and began to rely more on fish, procured probably with some intensive techniques. It is unlikely that game resources rebounded to pre-Kitoi levels during the break in cemetery use as the small dispersed Kitoi groups living in the area during that time would have put enough pressure on the resources through bow hunting to prevent a complete recovery.

This brings us back to the matter of the Bone Pendants which, as mentioned, are almost certainly an emulation of Red Deer Canine Pendants but hand-made from a more abundant and thus "cheaper" raw material (c.f., Chapter 7). Every red deer has only two canines, males' bigger than females' and slightly differently shaped (e.g., d'Errico and Vanhaeren, 2002), but the long bones of a single animal provide enough material to make hundreds of bone pendants. Unsurprisingly, these "faux" Red Deer Canine Pendants appear in Phase 2 in much larger numbers than the "real" Red Deer Canine Pendants in either phase. Interestingly, the second largest number of Bone Pendants associates with a Child grave (No. 28), along with several "real" Red Deer Canine Pendants. The logical conclusion seems to be that while Red Deer Canine Pendants denote real hunting success, Bone Pendants do not, which the isotopic data seem to indicate rather unequivocally. It is possible they instead denote an imaginary or desired hunting success where it was lacking or perhaps a desire to emulate a "style" which was initially enabled by, and associated with, hunting success. It is worth asking why Bone Pendants, seemingly a simple invention, were not introduced during Phase 1 when these people started to experience the shortage of red deer stocks clearly suggested by the isotopic data. Perhaps, since probably there was still more open landscape available around Kultuk Bay, these shortages where not yet as dire as during Phase 2.

This study substantially adds to the growing body of insights about the rich and diverse history of Middle Holocene hunter-gatherer adaptive strategies and the equally rich and diverse history of the large formal cemeteries used by these groups across Cis-Baikal (Bronk Ramsey et al., 2021; Goriunova et al., 2020; Goriunova et al., 2021; McKenzie, 2010; Scharlotta et al., 2016; Scharlotta et al., 2021; Weber, 2020; Weber et al., 2016a; Weber et al., 2021; White et al., 2020; White et al., 2021). It is obvious that Shamanka II provides a rich record of what is in many ways a very dynamic history of the groups using the cemetery, much beyond the mortuary side alone, and this history matches and complements the dynamic history of the Kitoi cultural pattern as summarized above.

During Phase 1, it is the actions of Groups 2 and 3 that appear to have been the driving force behind the main cultural, social, and economic processes experienced by the Kitoi groups living in the Kultuk Bay area. This is also supported by the observation that during Phase 1 the SE Cluster saw the fastest growth of mortuary events while burials in the S and NW Clusters occurred much more sporadically (Bronk Ramsey et al., 2021). Nonetheless, the actions of the remaining Phase 1 groups (Groups 1, 2–L, and 4) added an important element of variation to the Kitoi socio-economic pattern, without which Groups

2 and 3 perhaps would not have been able to function in such a dynamic fashion for as long as they did. Phase 2 seems to represent an attempt to re-establish the pattern that worked well during Phase 1 — mainly for Group 2 and perhaps Group 3 too — which, however, quickly failed probably due to the less abundant game resources, relative to what was available at the beginning of Phase 1 (Weber, 2020).

The examination presented in Chapters 4–7 is obviously somewhat incomplete. First, while it is novel in its systematic examination of Kitoi mortuary characteristics describing variation at the grave and burial levels, analysis of grave goods is limited to several categories believed to provide best insights about the lives of these people; thus, some grave goods have been excluded. Those which are considered to have entered grave pits accidentally from the cultural layer should certainly be omitted as their inclusion would simply muddle the analysis. But some items which are considered part of the grave goods assemblage but not part of the categories analyzed here might be useful to include in future examinations (e.g., green nephrite adzes, lithic scrapers or drills, and organic spoons, points or pressure flakers), though at the risk of crowding the analysis with too many categories. Third, one should also be open to different methods for grouping the grave goods, for example by creating a separate category for all green nephrite objects of which, in the current analysis, some are included with Knives but some are excluded (e.g., adzes and bits of raw nephrite). Finally, human aDNA studies, which are in progress, will provide much-needed insights into biological relatedness within the Shamanka II cemetery population.

Two other methodological points are also useful to make. Chapters 3–7 also provide practical guidelines on how to prepare the dataset for formal statistical analysis in terms of defining both independent and dependent variables. Compared to the initial study by Scharlotta et al. (2016), this examination uses far fewer independent variables and fewer categories of grave goods, providing a better focus which seems to have benefited analysis and results. Lastly, while formal statistical methods have their advantages (e.g., relative objectivity) the approach employed here appears to offer its own: a flexible tool to search for meaningful patterns which may not surface in a more formal examination.

Conclusion

Andrzej W. Weber

Excavations at Shamanka II produced some of the most important developments for middle Holocene archaeology of the Cis-Baikal region over the last 20–30 years. The academic significance of this material cannot be over-stated. Much has been written, both in Russian and English, about different aspects of the EN Kitoi groups from the Angara valley: be it their origins and position in the cultural chronology of the region, mortuary practices, craniology, demography, health and activity patterns, genetic characteristics, or diet and subsistence. Unfortunately, the common drawback of all these studies is that they rarely discuss the results in the context of other Kitoi cemeteries from the region or in the context of other categories of archaeological materials from the same site.

For example, the eponymous Kitoi cemetery was published quickly after it was excavated in the 1880s (e.g., Vitkovskii, 1882; Vitkovskii, 1889) and much is known about grave inclusions, burial disposal, and other aspects of the mortuary protocol at this site (Okladnikov, 1950; Okladnikov, 1974). However, since skeletal materials from this cemetery have not been available for research for the last 50–80 years, they have not been studied in the same manner as those from Lokomotiv. Consequently, no isotopic analyses have been done on the Kitoi collection with the exception of three skulls recently rediscovered in the Irkutsk Kraevedcheskii Muzei. However, due to the small sample size these results are unlikely to make a significant impact (Weber et al., 2016b).

The research history of Lokomotiv, the largest EN cemetery in the Angara valley, contrasts with that of Kitoi. The materials excavated at Lokomotiv during the 1980s have been subjected to a comprehensive program of human bioarchaeological studies (radiocarbon dating, carbon, nitrogen and strontium isotopic analyses, health and activity patterns, and ancient DNA; c.f., Weber, 2020; Weber et al., 2010) in addition to the craniological studies conducted earlier on the skeletons recovered in the 1920s and 1950s (e.g., Debets, 1930; Gerasimov, 1955; Mamonova, 1973; Mamonova, 1983) and one recent examination (Movsesian et al., 2014), which included both old and new materials. To date, Lokomotiv remains the only EN sample from the Angara valley examined so comprehensively and this situation will not change any time soon. The problem with Lokomotiv is that the cemetery has not yet been published as a monograph and the level of archaeological information available in a few general accounts is inadequate to provide sufficient context for its relatively rich bioarchaeological data. Moreover, most human skeletal materials from the older excavations have been lost or are impossible to locate. The other EN cemeteries from the Angara valley (e.g., Ust'-Belaia or Galashikha), in addition to suffering from the same problems that lower the utility of the Kitoi and Lokomotiv collections, are affected either by their much smaller size or poor preservation of the skeletal materials.

These circumstances underscore the tremendous research value of Shamanka II. Its collection of human skeletal remains is much larger than that of Lokomotiv (although the latter has not been excavated in full), the grave goods are rich and diverse, their distribution across the graves and burials is quite variable, the cemetery has complex spatial organization, and the preservation condition of organic objects and of the human and faunal skeletal remains is generally very good. The skeletal materials have seen the same range of bioarchaeological and isotopic analyses as the Lokomotiv collection, all conducted concurrently with excavations at Shamanka II or immediately after their completion.

Aware of the vast academic potential of the Shamanka II cemetery from the perspective of local, regional, and global research on boreal Holocene hunter-gatherers, the BAP developed a comprehensive program of monographic publications to disseminate the empirical and descriptive detail, along with insights from several analytical studies, to complement the large number of technical studies already published in refereed papers. The program of monographic publications consists of the following elements:

1. Three volumes published online in English by the German Archaeological Institute (GAI) in Berlin, including several digital supplements (Weber et al., 2024a);
2. This short version of the GAI monograph, published on paper by the Irkutsk State University (ISU) focusing on the analytical chapters, reorganized, revised and explicitly pursing examination of variation in various aspects of the mortuary materials procured from Shamanka II (also available online via the University of Alberta's Education Research Archive: https://doi.org/10.7939/r3-4dr2-2a56); and
3. Probably also a three-volume Russian language monograph published in Russia and consisting mostly of descriptions of the excavated graves and detailed morphological reviews of grave goods, as well as a full suite of grave and grave goods illustrations (line drawings and photos). The monograph is still in progress, under the leadership of V.I. Bazaliiskii, and is expected reach print in the near future.

While the excavations of a few graves in 2019, enabled by the lifting of restrictions to access a small portion of the cemetery, resulted in delays in the preparation of the GAI monograph, these delays also provided time to develop this short and revised ISU version. Still, there is one body of data and insights that is missing from both monographs. All Shamanka II individuals with sufficient dental remains (about 80 individuals) have been submitted for genomic research using the most recent generation of methodological advances and this work is still in progress at the University of Copenhagen and the University of Cambridge under the general guidance of Drs. Eske Willerslev, Matthew Collins, and Andrzej Weber. Although most results are already available and dedicated papers are expected soon, the editors decided to publish both monographs without these insights in order to avoid further delays. Accordingly, the authors did not consider it practical to summarize the previously published studies (de Barros Damgaard et al., 2018; Moussa et al., 2018; Moussa et al., 2021) from which only the results of genetic sexing are used.

Readers interested in how the information gained from examination of the Shamanka II materials contributes to a more general understanding of the history of the Kitoi culture and its spatio-temporal variation within Cis-Baikal are advised to consult three recent summary papers. The first of these papers examines matters of regional and microregional chronology and dietary variation (Weber et al., 2021). The second study

employs a novel method based on the radiocarbon dating of all available human burials to gain insights into the chronological position of all dated cemeteries as well as a much better understanding of the heretofore unclear history and patterns of use of several large Neolithic (including Shamanka II and Lokomotiv) and Early Bronze Age cemeteries (Bronk Ramsey et al., 2021). The third paper integrates all BAP archaeological, chronological, and bioarchaeological studies into a comprehensive model explaining the processes of culture change and variation among the region's hunter-gatherer groups from the Late Mesolithic to the Early Bronze Age (Weber, 2020) — the first such attempt since A.P. Okladnikov's synthesis more than half-century prior (Okladnikov, 1950; Okladnikov, 1955). All three papers are now also available as Russian translations (Weber, 2023; Weber et al., 2023a; Weber et al., 2023b).

The authors very much hope that both monographs, the full GAI and the short ISU versions, of the only fully excavated large Kitoi cemetery, will attract the attention of a broader Western and Russian scholarship. Given the general scarcity of early to middle Holocene hunter-gatherer cemeteries in northern Eurasia, Shamanka's academic value ranks together with such sites as Olenii Ostrov in Karelia (Gurina, 1956; Jacobs, 1995; O'Shea and Zvelebil, 1984), Zvejnieki in Latvia (Larsson and Zagorska, 2006), Skateholm and Vedbæk in southern Scandinavia (Albrethsen and Brinch Petersen, 1976; Larsson, 1988), and Téviec and Hoëdic in Britanny (Péquart and Péquart, 1954; Péquart et al., 1937). Ideally, the short ISU monograph will provide ideas for new creative approaches while the empirical detail of the GAI full monograph will make these pursuits possible. If these monographs eventually result in new general or specific studies on early–middle Holocene foragers in the Baikal region, and perhaps more broadly across northern Eurasia, their goals will be more than fulfilled.

Addendum: Summary of biochemical tests for Burial 42.02

Andrzej W. Weber, Rick J. Schulting, Vladimir I. Bazaliiskii, Erin Jessup

In this Addendum, we review all biochemical work (i.e., radiocarbon dating and carbon and nitrogen stable isotope measurements) done on Burial 42.02. Since the archaeological context is described in detail elsewhere (Bazaliiskii et al., 2024; Lieverse et al., 2024), it is sufficient to remind the reader that Grave 42 contained two individuals: Burial 42.01 (40−45-year-old female) occupying the upper level of the grave pit and Burial 42.02 (50+-year-old female) found on the grave floor. The two interments were separated from one another by about 50–60 cm of sediment. The skeleton of Burial 42.01 was intact and very complete, while the upper body of Burial 42.02 was disarticulated, and many skeletal elements were absent. To be clear, all leg long bones and the right hand bones were intact and mostly complete (Fig. A.1; Fig. A.2).

From the very beginning, the biochemical analyses of the skeletal remains associated with Burial 42.02 generated results that caused some confusion. This, in particular, regards the levels of $\delta^{15}N$, which were not only much lower than the rest of the Shamanka II cemetery population but a statistical outlier at the scale of the entire Kitoi EN population and even at the scale of all LM–EBA groups analyzed to date by the BAP (Weber et al., 2011; Weber et al., 2016a; Weber et al., 2021). The low $\delta^{15}N$ value meant that none of the equations to correct the Freshwater Reservoir Effect (FRE) developed for the Cis-Baikal region could be applied to the radiocarbon dates available for this individual. Consequently, although generally believed to belong to Phase 1, this individual was removed from the first examination of Shamanka's chronological and dietary patterns (Weber et al., 2016a).

In order to clarify this matter, biochemical analyses of Burial 42.02 were expanded to other skeletal elements and continued until recently. The last series of results (received in November 2023) are included in Tables S.2 and S.3 but arrived too late to be integrated with the chronological and dietary analyses prepared for this monograph. All currently available radiocarbon and stable isotope data are listed in Table A.1, accompanied by the following commentary about the progression and justification for all analyses undertaken.

1. A rib fragment was analyzed first by Dr. A.M. Katzenberg, University of Calgary, producing $\delta^{13}C$ and $\delta^{15}N$ values of –17.9 and 11.1‰, respectively (Weber et al., 2011; Table A.1: No. 1). While, at the time, the $\delta^{15}N$ value was by a large margin the lowest for the entire EN sample, it was published prior to the discovery of the FRE and, thus, did not cause any special concerns.

2. After the discovery of the FRE in the Cis-Baikal region (Bronk Ramsey et al., 2014; Nomokonova et al., 2013; Schulting et al., 2014), a program of redating all available Middle Holocene human skeletal remains from the region was undertaken in collaboration with the University of Oxford. At first, a femur sample was submitted for analysis, which produced a $\delta^{15}N$ value of 10.5‰, that is even lower than the rib sample (Table A.1: No. 2). To confirm these results, another femur sample was quickly sent for dating and stable isotope analysis, the latter generating a similarly low $\delta^{15}N$ result of 10.3‰ (Table A.1: No. 3).
3. In the next step, the remainder of the rib sample analyzed at the University of Calgary was analyzed in Oxford, producing yet another low $\delta^{15}N$ value of 10.6‰ (Table A.1: No. 4).
4. Since none of the obtained radiocarbon dates could be corrected for the FRE, it was decided to analyze dentine from post-weaning sections of two molars removed from the disarticulated mandible believed to belong to Burial 42.02 (Weber et al., 2021). These sections produced much higher $\delta^{15}N$ values of ca. 16‰ that were well within the variation range documented for the adult segment of the Shamanka II cemetery population. The radiocarbon dates obtained for these dentine samples could now be corrected for the FRE and indeed, Burial 42.02 dated to Phase 1 as expected (Table A.1: Nos. 5 and 6).

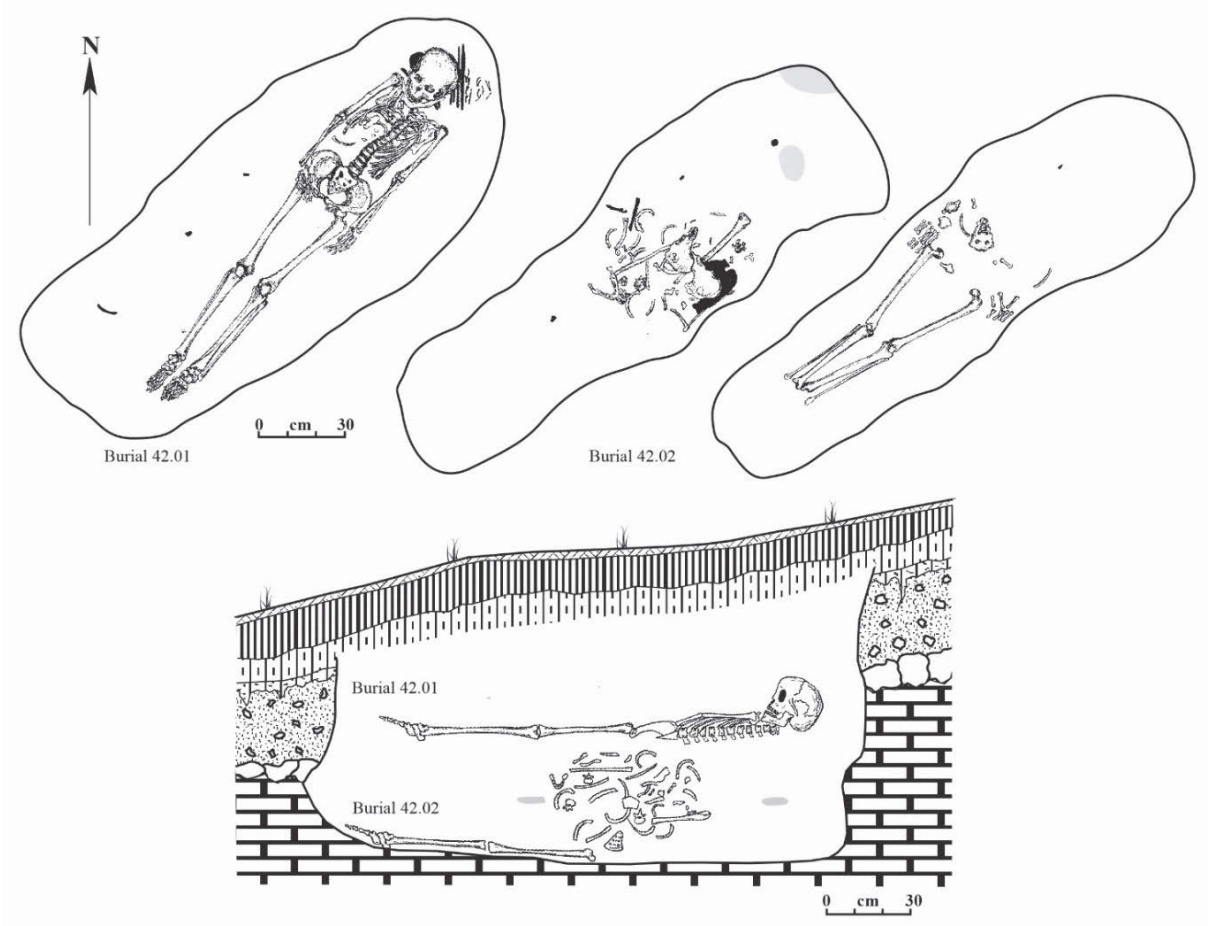


Figure A.1. Shamanka II, Grave 42: Floor plans and longitudinal-section. Figure by N.D. Kasprishina, A.A. Tiutrin, and V.I. Bazaliiskii

Figure A.2. Shamanka II, Grave 42: Burial 42.02 at the bottom of the grave pit

5. These results were interpreted as indicating a very interesting life history of this woman: she probably lived the early part of her life in the area of SW Baikal as demonstrated by the "local" dietary tooth signals, then moved away to an unknown area as indicated by the unusually low $\delta^{15}N$ bone values, and returned back to SW Baikal not long before she died and was ultimately interred at Shamanka II with the rest of the local Kitoi community (Schulting et al., 2022; Weber et al., 2021). Chapter 2 corresponds to this stage of the biochemical work on Burial 42.02.
6. To confirm that the mandible from which the two molars were dated in fact represents the same individual as the rib and femur samples, a small fragment of it was subsequently submitted for analysis. Surprisingly, the high $\delta^{15}N$ value of 14.8‰ indicated that the mandible does not come from the same individual as the previously analyzed rib and femur (Table A.1: No. 7). This meant that the

corrected dates obtained for the post-weaning molar dentine are not associated with Burial 42.02.

7. In the final step to resolve this conundrum, fragments of three additional elements (a different rib, a vertebra, and an os coxa fragment) believed to represent Burial 42.02 but coming from the disarticulated upper portion of the skeleton, were sent for analysis. All three samples produced radiocarbon dates and low $\delta^{15}N$ values (11.0–11.2‰) consistent with those first obtained for the rib and femur samples (Table A.1: Nos. 8, 9 and 10).
8. Overall, these results can be summarized as follows:
    - The mandible and the associated molars, as well as the biochemical results obtained on these samples, represent an individual that is different from Burial 42.02 and, obviously, also different from Burial 42.01, which has its own mandible and dates to Phase 2. Since this mandible appears to be the only skeletal element representing this unknown individual, it shall be considered under the category of Foreign Human Bones rather than a separate interment. Such a decision is consistent with a number of other instances of isolated human bones found in Shamanka II EN graves that could not be positively identified with the main burial(s) (Chapter 6; Table 6.4; Bazaliiskii et al., 2024; Lieverse et al., 2024).
    - All other analyzed elements shall be considered to belong to Burial 42.02. Even though some of these elements come from the disarticulated portion of the skeleton, their consistently low $\delta^{15}N$ values are unique in the Shamanka II EN cemetery population. Together, they strongly suggest that all analyzed elements come from the same individual with an adult diet quite different from the rest of the Shamanka II sample.
    - Since the adult diet of this female is outside the range of variation documented for the entire EN Kitoi population examined to date, none of the FRE correction equations available for Cis-Baikal are applicable to this case, and all these dates must remain uncorrected at least for now. It is worth noting that the elevated $\delta^{13}C$ values of about –17‰ preclude a purely terrestrial diet. While Burial 42.02 very likely dates to Phase 1, its more detailed chronological placement is currently not possible.

Obviously, at this point the reader is interested which sets of results should be averaged and accepted in future studies. This question is addressed in detail in a dedicated study (Schulting et al., 2025). In a nutshell, the stable isotope results without a radiocarbon date on the same collagen extraction (Table A.1: No. 1) as well as all results from the teeth and the mandible (Table A.1: Nos. 5, 6 and 7) and the one outlier date and associated isotopic measurements (Table A.1: No. 8) should be removed from future consideration. Consequently, the remaining five sets of results provide the combined radiocarbon date and averaged stable isotope values to be used in all future analyses (Table A.2).

The last matter to address is how these results affect the analyses presented in the monograph. In general, the consequences are not extensive because of how Grave 42, one of the scattered graves in the S Sector (Cluster), and its two burials are assigned to units of analysis. Grave 42 is not assigned to any of the Main Units of Analysis (MUA) because of its mixed chronological structure (Phase 1–Phase 2); Burial 42.02 probably belongs to Group 4, comprising 5 graves with 7 burials, a unit of analysis that is too small for any practical comparisons with other MUAs; and Burial 42.01 is assigned to Group 5, consisting of all Phase 2 individuals (Chapter 2; Table 3.2; Table 3.3).

Table A.1. History of radiocarbon dating and stable isotope analyses for Shamanka II Burial 42.02 (after Schulting et al., 2025)

No.	Element	Sample	OxA	Date BP	±	%Yld	%C	$\delta^{13}C$	$\delta^{15}N$	C:N
1	rib	H 2004.019	n/a	n/a	n/a	16.8	m.d.	-17.9	11.1	3.4
2	femur	H 2004.021	24774	6792	35	16.3	44.9	-17.6	10.5	3.0
3	femur	H 2009.147	26193	6821	35	14.4	43.4	-17.8	10.3	3.2
4	rib	H 2004.019	30595	6845	36	13.8	42.4	-18.1	10.6	3.3
5	tooth 46	H 2004.022	V-2727-18	7201	33	–	47.6	-17.1	16.2	3.1
6	tooth 48	H 2004.023	V-2727-19	7129	33	–	48.5	-17.0	15.4	3.2
7	mandible	H 2022.029	44029	7039	21	12.3	39.0	-16.9	14.8	3.2
8	rib	H 2023.029	44005	6762	28	11.6	43.6	-17.8	11.2	3.2
9	atlas	H 2023.030	44006	6871	23	8.5	42.1	-18.0	11.0	3.2
10	os coxa	H 2023.031	44007	6858	23	11.4	42.4	-17.9	11.0	3.2

Table A.2. Combined radiocarbon date and averaged stable isotope results for Shamanka II Burial 42.02

No.	Elements	Samples	OxA	Date BP	±	R_Combine test	%Yld	%C	$\delta^{13}C$	$\delta^{15}N$	C:N
2	femur	H 2004.021	24774								
3	femur	H 2009.147	26193								
4	rib	H 2004.019	30595	6847	13	χ^2-Test: df=4, T=4.3(5% 9.5)	12.9	43.0	-17.9	10.7	3.2
9	atlas	H 2023.030	44006								
10	os coxa	H 2023.031	44007								

Regarding the individual chapters:

- Chapter 2. Dates for Burial 42.02 should be removed from all chronological analyses because they cannot be corrected for the FRE. However, since the molar dentine date (which was corrected for the FRE) sits roughly in the middle of the chronological range of Phase 1 dates, it is doubtful that running the Bayesian models again without it would produce results significantly different from those generated by the dataset that included it (Bronk Ramsey et al., 2021; Weber et al., 2021). Regarding the dietary variation, Burial 42.02 was already excluded from examination of dietary trends both in previous publications (i.e., Weber et al., 2016a; Weber et al., 2016b; Weber et al., 2021) as well as in this monograph.
- Chapters 4 and 5. Due to the assignment of Grave 42 and its two burials to MUAs as described above, the impact on the analysis presented in these chapters is limited too. More specifically:
  - None of the variables analyzed at the Grave Level are affected.
  - At the Burial Level, only Skeletal Completeness and Articulation are affected, but to a negligible degree, while the Age and Sex of Burial 42.02 remain the same.
  - Lastly, Grave 42 is excluded from the examination of Grave Goods because this aspect of the analysis is limited to graves with burials of the same sex and representing the same phase of cemetery use. Since Burial 42.02 was believed to date to Phase 1 (and probably still dates to Phase 1) and Burial 42.01 dated to Phase 2, Grave 42 was excluded from the analysis of Grave Goods.
- Chapter 6 is not affected at all because the only relevant mortuary variable analyzed in this chapter is Foreign Human Bones and Grave 42 was already

recorded as “Present” due to the presence of a stray human rib (different than the one sampled for dating and isotope analysis).

- Chapter 7. The faunal assemblage of Grave 42 was not particularly diverse or abundant, consisting of 19 hare incisors and 1 sable canine. All these elements are accounted for in the part dedicated to taxonomic structure. Since Grave 42 was Reopened it is excluded from the analysis of distribution patterns of the faunal remains carried out in this chapter. However, if the grave were to be divided into two separate graves (i.e., Intact Gr. 42-1 with Burial 42.01 from Phase 2 and Reopened Gr. 42-2 with Burial 42.02 probably from Phase 1) in a manner similar to Grave 59, the presence of 19 hare incisors associated with Burial 42.01 would be worth mentioning. This, however, would not affect any of the observations drawn from the examination of the larger sample of graves and burials without Grave 42 and its two female interments.

Overall, while the entire analytical work (including the “detour” of dating post-weaning molar dentine) to characterize Burial 42.02 chronologically and in dietary terms at the same level of detail as the rest of the Shamanka II cemetery population was a very interesting research exercise, in the end both matters remain somewhat shrouded in mystery.

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Information about the Authors

Weber, Andrzej W.
Ph. D., Professor, Department of Anthropology, University of Alberta;
13-15 HM Tory Building, Edmonton, AB, T6G 2H4, Canada.
Head of the Laboratory of Geoarcheology of Baikal Siberia, Scientific Research Center "Baikal Region", Irkutsk State University;
1, K. Marx St., Irkutsk, 664003, Russian Federation.
e-mail: aweber@ualberta.ca

Bazaliiskii, Vladimir I.
Research Engineer, Scientific Research Center "Baikal Region", Irkutsk State University;
1, K. Marx St., Irkutsk, 664003, Russian Federation.
e-mail: bazalirk@yandex.ru

Jessup, Erin
Department of Anthropology, University of Alberta;
13-15 HM Tory Building, Edmonton, AB, T6G 2H4, Canada.
e-mail: ejessup@ualberta.ca

Supplements

TABLE S.1. Shamanka II Fieldwork Summary

m.d. = missing data; n/a = not applicable

Note that the Bronze Age features have their own spatial structure, consisting of two sectors (North and South) only.

Feature No.	Year	Feature type	Archaeological age	Pit azimuth	No. of individuals	Sector	Cluster	Row	Latitude N	Longitude E	Decimal Lat. N	Decimal Long. E	Excavators
2	1963/64	Grave	Early Bronze Age	m.d.	m.d.	South	n/a	m.d.	m.d.	m.d.	m.d.	m.d.	A.I. Komissarov, A.V. Tivanenko
3	1965	Grave	Early Neolithic	m.d.	m.d.	South	S	m.d.	m.d.	m.d.	m.d.	m.d.	A.I. Komissarov, A.V. Tivanenko
1	1996	Grave	m.d.	m.d.	m.d.	m.d.	m.d.	m.d.	51°41'38.87"	103°42'15.87"	51,694131	103,704408	V.V. Makhno
2	1998	Grave	Early Bronze Age	m.d.	1	South	n/a	n/a	51°41'39.67"	103°42'17.08"	51,694353	103,704744	A.V. Kharinskii, G.V. Turkin
3	1998	Grave	Early Bronze Age	m.d.	1	South	n/a	n/a	51°41'39.64"	103°42'16.91"	51,694344	103,704697	A.V. Kharinskii, G.V. Turkin
4	1998	Grave	Early Neolithic	35	1	North	SE	scattered	51°41'39.64"	103°42'16.95"	51,694344	103,704708	A.V. Kharinskii, G.V. Turkin
6	1998	Grave	Early Neolithic	42	1	North	SE	scattered	51°41'39.26"	103°42'16.63"	51,694239	103,704619	A.V. Kharinskii, G.V. Turkin
7	1999	Grave	Early Neolithic	46	1	North	SE	scattered	51°41'39.27"	103°42'16.72"	51,694242	103,704644	G.V. Turkin
5	2000	Grave	Early Bronze Age	m.d.	1	South	n/a	n/a	51°41'39.44"	103°42'16.69"	51,694289	103,704636	V.I. Bazaliiskii
8	2000	Grave	Early Neolithic	39	1	North	SE	H	51°41'39.44"	103°42'16.56"	51,694289	103,704600	V.I. Bazaliiskii
9	2000	Grave	Early Bronze Age	m.d.	1	South	n/a	n/a	51°41'39.53"	103°42'16.89"	51,694314	103,704692	V.I. Bazaliiskii
10	2000	Grave	Early Neolithic	47	1	North	SE	G	51°41'39.55"	103°42'16.87"	51,694319	103,704686	V.I. Bazaliiskii
11	2001	Grave	Early Neolithic	36	2	North	SE	scattered	51°41'39.33"	103°42'16.44"	51,694258	103,704567	V.I. Bazaliiskii
12	2001	Grave	Early Neolithic	45	1	North	SE	H	51°41'39.48"	103°42'16.43"	51,694300	103,704564	V.I. Bazaliiskii
13	2001	Grave	Early Neolithic	30	3	North	SE	H	51°41'39.57"	103°42'16.12"	51,694325	103,704478	V.I. Bazaliiskii

Feature No.	Year	Feature type	Archaeological age	Pit azimuth	No. of individuals	Sector	Cluster	Row	Latitude N	Longitude E	Decimal Lat. N	Decimal Long. E	Excavators
14	2001	Grave	Early Neolithic	29	2	North	SE	H	51°41'39.54"	103°42'16.28"	51,694317	103,704522	V.I. Bazaliiskii
15	2001	Grave	Early Neolithic	46	1	North	SE	H	51°41'39.52"	103°42'16.33"	51,694311	103,704536	V.I. Bazaliiskii
16	2001	Grave	Early Neolithic	51	1	North	SE	scattered	51°41'39.56"	103°42'16.43"	51,694322	103,704564	V.I. Bazaliiskii
17	2001	Grave	Early Neolithic	43	2	North	SE	scattered	51°41'39.53"	103°42'16.44"	51,694314	103,704567	V.I. Bazaliiskii
18	2001	Grave	Early Neolithic	33	1	North	SE	G	51°41'39.58"	103°42'16.61"	51,694328	103,704614	V.I. Bazaliiskii
19	2001	Grave	Early Neolithic	29	1	North	SE	G	51°41'39.55"	103°42'16.68"	51,694319	103,704633	V.I. Bazaliiskii
20	2002	Grave	Early Neolithic	36	5	North	SE	G	51°41'39.68"	103°42'16.54"	51,694356	103,704594	V.I. Bazaliiskii
21	2002	Grave	Early Neolithic	36	3	North	SE	F	51°41'39.84"	103°42'16.77"	51,694400	103,704658	V.I. Bazaliiskii
22	2002	Grave	Early Neolithic	28	1	North	SE	F	51°41'39.87"	103°42'16.65"	51,694400	103,704658	V.I. Bazaliiskii
23	2002	Grave	Early Neolithic	31	5	North	SE	F	51°41'39.79"	103°42'16.85"	51,694386	103,704681	V.I. Bazaliiskii
24	2002	Grave	Early Neolithic	62	2	North	SE	scattered	51°41'39.90"	103°42'16.77"	51,694417	103,704658	V.I. Bazaliiskii
25	2003	Grave	Early Neolithic	44	4	North	SE	F	51°41'39.92"	103°42'16.53"	51,694422	103,704592	V.I. Bazaliiskii
26	2003	Grave	Early Neolithic	62	4	South	S	I	51°41'38.81"	103°42'15.87"	51,694114	103,704408	V.I. Bazaliiskii
27	2003	Grave	Early Neolithic	56	4	South	S	I	51°41'38.91"	103°42'15.71"	51,694142	103,704364	V.I. Bazaliiskii
28	2003	Grave	Early Neolithic	66	1	South	S	scattered	51°41'38.79"	103°42'15.73"	51,694108	103,704369	V.I. Bazaliiskii
29	2003	Grave	Early Neolithic	42	1	South	S	J	51°41'38.85"	103°42'15.4"	51,694125	103,704278	V.I. Bazaliiskii
30	2003	Grave	Early Neolithic	50	1	South	S	J	51°41'38.78"	103°42'15.42"	51,694106	103,704283	V.I. Bazaliiskii
31	2003	Grave	Early Neolithic	46	1	South	S	J	51°41'38.73"	103°42'15.51"	51,694092	103,704308	V.I. Bazaliiskii
32	2003	Grave	Early Neolithic	53	1	South	S	scattered	51°41'38.79"	103°42'15.22"	51,694108	103,704228	V.I. Bazaliiskii

Feature No.	Year	Feature type	Archaeological age	Pit azimuth	No. of individuals	Sector	Cluster	Row	Latitude N	Longitude E	Decimal Lat. N	Decimal Long. E	Excavators
33	2003	Grave	Early Neolithic	39	1	South	S	J	51°41'38.78"	103°42'15.43"	51,694106	103,704286	V.I. Bazaliiskii
34	2003	Grave	Early Neolithic	66	1	South	S	J	51°41'38.95"	103°42'15.27"	51,694153	103,704242	V.I. Bazaliiskii
35	2003	Grave	Early Neolithic	61	2	South	S	scattered	51°41'38.65"	103°42'15.35"	51,694069	103,704264	V.I. Bazaliiskii
36	2003	Grave	Early Neolithic	67	1	South	S	I	51°41'39.03"	103°42'15.52"	51,694175	103,704311	V.I. Bazaliiskii
37	2003	Grave	Early Neolithic	25	1	South	S	scattered	51°41'38.74"	103°42'15.60"	51,694094	103,704333	V.I. Bazaliiskii
38	2003	Grave	Early Neolithic	62	1	South	S	J	51°41'39.00"	103°42'15.23"	51,694167	103,704231	V.I. Bazaliiskii
39	2004	Grave	Early Neolithic	49	1	South	S	scattered	51°41'38.56"	103°42'15.13"	51,694044	103,704203	V.I. Bazaliiskii
40	2004	Grave	Early Neolithic	103	1	South	S	scattered	51°41'38.61"	103°42'15.27"	51,694058	103,704242	V.I. Bazaliiskii
41	2004	Grave	Early Neolithic	41	1	South	S	scattered	51°41'38.54"	103°42'14.90"	51,694039	103,704139	V.I. Bazaliiskii
42	2004	Grave	Early Neolithic	54	2	South	S	scattered	51°41'38.58"	103°42'14.63"	51,694050	103,704064	V.I. Bazaliiskii
43	2004	Grave	Early Neolithic	149	1	South	S	K	51°41'38.45"	103°42'14.63"	51,694014	103,704064	V.I. Bazaliiskii
44	2004	Grave	Early Neolithic	154	2	South	S	K	51°41'38.38"	103°42'14.54"	51,693994	103,704039	V.I. Bazaliiskii
45	2004	Grave	Early Neolithic	60	1	South	S	scattered	51°41'38.68"	103°42'14.86"	51,694078	103,704128	V.I. Bazaliiskii
46	2004	Grave	Early Neolithic	148	1	South	S	K	51°41'38.24"	103°42'14.43"	51,693956	103,704008	V.I. Bazaliiskii
47	2004	Grave	Early Neolithic	123	1	South	S	K	51°41'38.20"	103°42'14.34"	51,693944	103,703983	V.I. Bazaliiskii
48	2004	Grave	Early Neolithic	32	4	South	S	scattered	51°41'38.11"	103°42'14.29"	51,693920	103,703970	V.I. Bazaliiskii
49	2004	Grave	Early Neolithic	56	1	South	S	scattered	51°41'38.13"	103°42'14.13"	51,693925	103,703925	V.I. Bazaliiskii
50	2004	Grave	Early Neolithic	47	3	North	SE	G	51°41'39.81"	103°42'16.31"	51,694392	103,704531	V.I. Bazaliiskii
51	2004	Grave	Early Neolithic	49	1	North	SE	scattered	51°41'39.72"	103°42'16.21"	51,694367	103,704503	V.I. Bazaliiskii

Feature No.	Year	Feature type	Archaeological age	Pit azimuth	No. of individuals	Sector	Cluster	Row	Latitude N	Longitude E	Decimal Lat. N	Decimal Long. E	Excavators
52	2004	Grave	Early Neolithic	64	2	North	SE	F	51°41'40.08"	103°42'16.21"	51,694467	103,704503	V.I. Bazaliiskii
53	2004	Grave	Early Neolithic	67	2	North	SE	scattered	51°41'40.01"	103°42'16.10"	51,694447	103,704472	V.I. Bazaliiskii
54	2004	Grave	Early Neolithic	54	1	North	SE	F	51°41'40.00"	103°42'16.31"	51,694444	103,704531	V.I. Bazaliiskii
55	2004	Grave	Early Neolithic	59	2	North	SE	F	51°41'40.02"	103°42'16.27"	51,694450	103,704520	V.I. Bazaliiskii
56	2004	Grave	Early Neolithic	75	2	North	SE	G	51°41'39.91"	103°42'16.08"	51,694419	103,704467	V.I. Bazaliiskii
57	2004	Grave	Early Neolithic	42	2	North	SE	G	51°41'39.84"	103°42'16.21"	51,694400	103,704503	V.I. Bazaliiskii
58	2004	Grave	Early Neolithic	79	1	North	SE	G	51°41'39.76"	103°42'16.40"	51,694378	103,704556	V.I. Bazaliiskii
59	2005	Grave	Early Neolithic	38	2	North	SE	scattered	51°41'39.76"	103°42'15.99"	51,694378	103,704442	V.I. Bazaliiskii
60	2005	Grave	Early Neolithic	70	2	North	SE	F	51°41'40.20"	103°42'16.15"	51,694500	103,704486	V.I. Bazaliiskii
61	2005	Grave	Early Neolithic	43	3	North	SE	E	51°41'40.07"	103°42'16.82"	51,694464	103,704672	V.I. Bazaliiskii
62	2005	Grave	Early Neolithic	32	5	North	SE	E	51°41'40.09"	103°42'16.62"	51,694469	103,704617	V.I. Bazaliiskii
63	2005	Grave	Early Neolithic	48	3	North	SE	E	51°41'40.16"	103°42'16.57"	51,694489	103,704603	V.I. Bazaliiskii
64	2005	Grave	Early Neolithic	62	2	North	SE	scattered	51°41'40.17"	103°42'16.79"	51,694492	103,704664	V.I. Bazaliiskii
65	2005	Grave	Early Neolithic	55	1	North	SE	F	51°41'40.30"	103°42'16.08"	51,694528	103,704467	V.I. Bazaliiskii
66	2005	Grave	Early Neolithic	67	2	North	SE	E	51°41'40.32"	103°42'16.33"	51,694533	103,704536	V.I. Bazaliiskii
67	2005	Grave	Early Neolithic	54	1	North	SE	E	51°41'40.28"	103°42'16.43"	51,694522	103,704564	V.I. Bazaliiskii
68	2005	Grave	Early Neolithic	82	1	North	SE	scattered	51°41'40.17"	103°42'16.72"	51,694492	103,704644	V.I. Bazaliiskii
69	2006	Grave	Early Neolithic	25	3	North	SE	scattered	51°41'40.08"	103°42'17.16"	51,694467	103,704767	V.I. Bazaliiskii
70	2006	Grave	Early Neolithic	35	1	North	SE	scattered	51°41'40.34"	103°42'16.89"	51,694539	103,704692	V.I. Bazaliiskii

Feature No.	Year	Feature type	Archaeological age	Pit azimuth	No. of individuals	Sector	Cluster	Row	Latitude N	Longitude E	Decimal Lat. N	Decimal Long. E	Excavators
71	2006	Grave	Early Neolithic	34	1	North	SE	M	51°41'40.42"	103°42'17.02"	51,694561	103,704728	V.I. Bazaliiskii
72	2006	Grave	Early Neolithic	40	1	North	SE	scattered	51°41'40.50"	103°42'17.04"	51,694583	103,704733	V.I. Bazaliiskii
73	2006	Grave	Early Neolithic	110	1	North	NW	scattered	51°41'40.49"	103°42'15.90"	51,694581	103,704417	V.I. Bazaliiskii
74	2006	Grave	Early Neolithic	65	1	North	NW	D	51°41'40.34"	103°42'15.71"	51,694539	103,704364	V.I. Bazaliiskii
75	2006	Grave	Early Neolithic	70	1	North	NW	D	51°41'40.41"	103°42'15.60"	51,694558	103,704333	V.I. Bazaliiskii
76	2006	Grave	Early Neolithic	65	1	North	NW	D	51°41'40.45"	103°42'15.57"	51,694569	103,704325	V.I. Bazaliiskii
77	2006	Grave	Early Neolithic	81	1	North	NW	D	51°41'40.51"	103°42'15.53"	51,694586	103,704314	V.I. Bazaliiskii
78	2006	Grave	Early Neolithic	53	4	North	NW	scattered	51°41'40.62"	103°42'15.76"	51,694617	103,704378	V.I. Bazaliiskii
79	2006	Grave	Early Neolithic	60	1	North	NW	scattered	51°41'40.70"	103°42'15.72"	51,694639	103,704367	V.I. Bazaliiskii
80	2006	Grave	Early Neolithic	42	1	North	NW	scattered	51°41'40.65"	103°42'15.65"	51,694625	103,704347	V.I. Bazaliiskii
81	2006	Grave	Early Neolithic	50	1	North	NW	C	51°41'40.75"	103°42'15.79"	51,694653	103,704386	V.I. Bazaliiskii
82	2006	Grave	Early Neolithic	0	1	North	SE	scattered	51°41'40.15"	103°42'15.76"	51,694486	103,704378	V.I. Bazaliiskii
83	2006	Grave	Early Neolithic	64	2	North	NW	C	51°41'40.71"	103°42'15.97"	51,694642	103,704436	V.I. Bazaliiskii
84	2006	Ritual pit	Early Bronze Age	m.d.	n/a	?	n/a	n/a	51°41'40.72"	103°42'16.70"	51,694644	103,704639	V.I. Bazaliiskii
85	2007	Grave	Early Neolithic	81	1	North	SE	M	51°41'40.58"	103°42'16.67"	51,694606	103,704631	V.I. Bazaliiskii
86	2007	Grave	Early Neolithic	53	2	North	NW	B	51°41'40.78"	103°42'16.26"	51,694661	103,704517	V.I. Bazaliiskii
87	2007	Grave	Early Neolithic	80	1	North	NW	C	51°41'40.62"	103°42'16.19"	51,694617	103,704497	V.I. Bazaliiskii
88	2007	Grave	Early Neolithic	58	1	North	NW	A	51°41'40.86"	103°42'16.34"	51,694683	103,704539	V.I. Bazaliiskii
89	2007	Grave	Early Neolithic	55	1	North	NW	scattered	51°41'40.74"	103°42'16.17"	51,694650	103,704492	V.I. Bazaliiskii

Feature No.	Year	Feature type	Archaeological age	Pit azimuth	No. of individuals	Sector	Cluster	Row	Latitude N	Longitude E	Decimal Lat. N	Decimal Long. E	Excavators
90	2007	Grave	Early Neolithic	28	1	North	NW	scattered	51°41'40.63"	103°42'16.38"	51,694619	103,704550	V.I. Bazaliiskii
91	2007	Grave	Early Neolithic	72	1	North	NW	A	51°41'40.92"	103°42'16.26"	51,694700	103,704517	V.I. Bazaliiskii
92	2007	Grave	Early Neolithic	61	1	North	NW	B	51°41'40.87"	103°42'16.09"	51,694686	103,704469	V.I. Bazaliiskii
93	2007	Grave	Early Neolithic	n/a	1	North	NW	C	51°41'40.82"	103°42'15.67"	51,694672	103,704353	V.I. Bazaliiskii
94	2007	Grave	Early Neolithic	79	1	North	NW	B	51°41'40.96"	103°42'15.93"	51,694711	103,704425	V.I. Bazaliiskii
95	2007	Grave	Early Neolithic	39	1	North	NW	A	51°41'40.94"	103°42'16.17"	51,694706	103,704492	V.I. Bazaliiskii
96	2007	Grave	Early Neolithic	50	1	North	NW	C	51°41'40.91"	103°42'15.65"	51,694697	103,704347	V.I. Bazaliiskii
97	2007	Cenotaph	Early Neolithic	59	0	North	NW	C	51°41'41.02"	103°42'15.48"	51,694728	103,704300	V.I. Bazaliiskii
98	2007	Grave	Early Neolithic	112	1	North	NW	scattered	51°41'41.12"	103°42'15.56"	51,694756	103,704322	V.I. Bazaliiskii
99	2007	Grave	Early Neolithic	53	1	North	NW	A	51°41'41.05"	103°42'15.90"	51,694736	103,704417	V.I. Bazaliiskii
100	2007	Ritual pit	Early Neolithic	37	n/a	North	NW	scattered	51°41'40.41"	103°42'15.45"	51,694836	103,704292	V.I. Bazaliiskii
101	2007	Ritual pit	Early Neolithic	n/a	n/a	North	NW	scattered	51°41'40.38"	103°42'15.83"	51,694550	103,704397	V.I. Bazaliiskii
102	2007	Ritual pit	Early Neolithic	319	n/a	North	NW	C	51°41'40.80"	103°42'15.69"	51,694667	103,704358	V.I. Bazaliiskii
103	2008	Grave	Early Bronze Age	m.d.	2	North	n/a	n/a	51°41'40.53"	103°42'17.38"	51,694592	103,704828	V.I. Bazaliiskii
104	2008	Grave	Early Neolithic	55	1	North	SE	scattered	51°41'40.55"	103°42'17.33"	51,694597	103,704814	V.I. Bazaliiskii
105	2008	Grave	Early Bronze Age	m.d.	1	North	n/a	n/a	51°41'40.37"	103°42'17.36"	51,694547	103,704822	V.I. Bazaliiskii
106	2008	Grave	Developed Bronze Age	m.d.	1	North	n/a	n/a	51°41'40.32"	103°42'17.41"	51,694533	103,704836	V.I. Bazaliiskii
107	2008	Grave	Early Bronze Age	m.d.	1	North	n/a	n/a	51°41'40.29"	103°42'17.33"	51,694525	103,704814	V.I. Bazaliiskii
108	2008	Grave	Early Neolithic	37	2	North	SE	M	51°41'40.30"	103°42'17.31"	51,694528	103,704808	V.I. Bazaliiskii

Feature No.	Year	Feature type	Archaeological age	Pit azimuth	No. of individuals	Sector	Cluster	Row	Latitude N	Longitude E	Decimal Lat. N	Decimal Long. E	Excavators
109	2008	Grave	Early Bronze Age	m.d.	1	North	n/a	n/a	51°41'40.48"	103°42'17.27"	51,694578	103,704797	V.I. Bazaliiskii
110	2008	Grave	Early Bronze Age	m.d.	0	North	n/a	n/a	51°41'40.43"	103°42'17.57"	51,694564	103,704881	V.I. Bazaliiskii
111	2008	Grave	Early Bronze Age	m.d.	1	North	n/a	n/a	51°41'40.68"	103°42'17.16"	51,694633	103,704767	V.I. Bazaliiskii
112	2008	Grave	Early Neolithic	336	1	North	SE	L	51°41'40.65"	103°42'17.17"	51,694625	103,704769	V.I. Bazaliiskii
113	2019	Grave	Early Bronze Age	m.d.	1	North	n/a	n/a	51°41'40.60"	103° 42' 16.99"	51,69461	103,70472	V.I. Bazaliiskii
114	2019	Grave	Early Bronze Age	m.d.	2	North	n/a	n/a	51°41'40.56"	103°42'16.92"	51,6946	103,7047	V.I. Bazaliiskii
115	2019	Grave	Early Neolithic	313	2	North	SE	L	51°41'40.61"	103°42'17.03"	51,694615	103,70473	V.I. Bazaliiskii
116	2019	Grave	Early Neolithic	323	1	North	SE	L	51°41'40.65"	103°42'17.1"	51,694625	103,70475	V.I. Bazaliiskii

TABLE S.2. Radiocarbon and Stable Isotope Data (Phase Sort)

Results are sorted by Phase and Corr Date or Date BP for individuals dated by faunal proxies. Individuals without such dates are grouped at the bottom and are omitted from analysis.
Individuals with Master_IDs followed by “FP” are dated by faunal proxy samples.
The total number of C14 dates generated for Shamanka II is higher than what is shown in this supplement because a number of burials were dated multiple times. Weber et al. 2016a provides detailed explanation of how multiple dates for the same individual were handled.
Sex categories: M, Male; PM, Probable Male; F, Female; PF, Probable Female; U–A, Undetermined Sex (Adolescent or Adult); U–C, Undetermined Sex (Child).

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
Phase 1																	
1	SHA_2003.025.03	20+ y.	PF	7086	34	6911	73	175	7756	75	-16,0	12,5	North	F	SE	1	2
2	SHA_2002.021.01	25–30 y.	M	6845	40	6682	76	163	7552	60	-16,4	12,4	North	F	SE	1	2
3	SHA_2005.066.01	25–35 y.	F	6967	28	6654	70	313	7531	54	-17,1	13,6	North	E	SE	1	2
4	SHA_2006.073	16–18 y.	F	7010	45	6630	78	380	7516	59	-16,5	14,1	North	scattered	NW	1	3
5	SHA_2004.058	35–45 y.	M	6980	28	6628	70	352	7515	53	-16,8	13,9	North	G	SE	1	2
6	SHA_2003.027.01	35–50 y.	M	6939	33	6616	72	323	7507	55	-16,8	13,6	South	I	S	1	1
7	SHA_2002.023.03	20+ y.	U–A	6900	34	6612	73	288	7505	56	-17,2	13,4	North	F	SE	1	2
8	SHA_2003.034	35–45 y.	M	6970	35	6609	73	361	7503	56	-16,6	14,0	South	J	S	1	1
9	SHA_2002.020.0A	20+ y.	U–A	6940	40	6606	76	334	7501	59	-16,8	13,7	North	G	SE	1	2
10	SHA_2007.085	25–35 y.	M	6935	39	6605	75	330	7500	58	-15,6	13,7	North	M	SE	1	1
11	SHA_2004.043	35–50 y.	PF	7046	35	6603	73	443	7499	57	-17,0	14,6	South	K	S	1	1
12	SHA_2002.021.02	25–30 y.	M	6972	34	6586	73	386	7488	59	-16,5	14,1	North	F	SE	1	2
13	SHA_2007.088	6–8 y.	U–C	6910	35	6580	73	330	7483	61	-16,6	13,7	North	A	NW	1	1
14	SHA_2005.062.03	20+ y.	PF	7022	39	6580	75	442	7483	62	-15,8	14,6	North	E	SE	1	2
15	SHA_2002.023.05	20+ y.	M	7021	35	6573	73	448	7478	62	-15,9	14,6	North	F	SE	1	2
16	SHA_2006.077	30–39 y.	F	7025	40	6570	76	455	7475	65	-16,7	14,7	North	D	NW	1	1
17	SHA_2004.045	25–35 y.	M	6881	36	6568	74	313	7474	64	-16,4	13,6	South	scattered	S	1	4
18	SHA_2004.041	30–39 y.	M	n/a	n/a	6567	53	378	7478	47	-16,9	14,1	South	scattered	S	1	4
19	SHA_2006.079	35–50 y.	PF	7063	39	6566	75	497	7472	66	-15,2	15,0	North	scattered	NW	1	3
20	SHA_2003.025.02	17–21 y.	U–A	7117	37	6566	74	551	7472	65	-16,0	15,5	North	F	SE	1	2
21	SHA_2003.029	20–30 y.	M	6838	36	6563	74	275	7469	65	-16,2	13,3	South	J	S	1	1
22	SHA_2005.065	50+ y.	M	6979	30	6561	71	418	7469	63	-16,4	14,4	North	F	SE	1	2

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
23	SHA_2007.093.02	35–40 y.	F	7012	37	6561	74	451	7468	66	-16,4	14,7	North	C	NW	1	1
24	SHA_2004.050.02	25–29 y.	M	6875	26	6539	69	336	7448	67	-16,9	13,7	North	G	SE	1	2
25	SHA_2002.021.03	16–18 y.	M	6955	38	6537	75	418	7445	71	-15,6	14,4	North	F	SE	1	2
26	SHA_2004.044.02	20+ y.	M	6901	35	6533	73	368	7441	70	-16,9	14,0	South	K	S	1	1
27	SHA_2006.078.04	35–50	F	7012	39	6532	75	480	7440	72	-15,8	14,9	North	scattered	NW	1	3
28	SHA_2005.062.05	45–59 y.	M	6859	36	6525	74	334	7432	72	-16,7	13,7	North	E	SE	1	2
29	SHA_2003.033	35–45 y.	M	6913	34	6522	73	391	7430	71	-16,4	14,2	South	J	S	1	1
30	SHA_2005.062.04	20+ y.	PM	7005	38	6521	75	484	7428	73	-15,7	14,9	North	E	SE	1	2
31	SHA_2005.061.02	35–45 y.	M	6915	38	6514	75	401	7421	73	-15,9	14,3	North	E	SE	1	2
32	SHA_2006.074	18–20 y.	M	6948	39	6514	75	434	7421	73	-16,0	14,5	North	D	NW	1	1
33	SHA_2002.022	19–22 y.	M	n/a	n/a	6512	52	571	7420	57	-15,9	15,6	North	F	SE	1	2
34	SHA_2000.010	25–35 y.	M	6867	35	6508	73	359	7415	71	-16,8	13,9	North	G	SE	1	2
35	SHA_1998.004	35–45 y.	M	6906	38	6506	75	400	7413	72	-15,9	14,3	North	scattered	SE	1	3
36	SHA_2005.062.01	35–45 y.	PF	6862	37	6505	74	357	7412	72	-16,0	13,9	North	E	SE	1	2
37	SHA_2003.027.02	25–30 y.	M	6950	39	6503	75	447	7410	72	-16,7	14,6	South	I	S	1	1
38	SHA_2005.067	7–9 y.	U–C	6885	40	6501	76	384	7408	73	-17,6	14,1	North	E	SE	1	2
39	SHA_2004.039	40–44 y.	M	n/a	n/a	6500	42	408	7405	49	-16,4	14,2	South	scattered	S	1	4
40	SHA_2003.032	35–45 y.	M	6921	35	6492	73	429	7399	70	-16,1	14,5	South	scattered	S	1	4
41	SHA_2002.023.02	20+ y.	PF	7128	39	6489	75	639	7396	71	-15,4	16,2	North	F	SE	1	2
42	SHA_2006.069.02	20–25 y.	F	6953	39	6485	75	468	7392	70	-14,7	14,8	North	scattered	SE	1	3
43	SHA_2002.024.02	12–15 y.	U–A	6901	34	6479	73	422	7387	68	-15,4	14,4	North	scattered	SE	1	3
44	SHA_2005.063.02	25–35 y.	M	6908	32	6474	72	434	7382	66	-15,0	14,5	North	E	SE	1	2
45	SHA_2004.055.02	5–7 y.	U–C	7017	39	6472	75	545	7381	69	-16,0	15,4	North	F	SE	1	2
46	SHA_2004.048.01	50+ y.	M	n/a	n/a	6469	51	459	7375	48	-16,4	14,8	South	scattered	S	1	4
47	SHA_2001.013.03	18–19 y.	M	6837	27	6467	70	370	7376	64	-15,0	14,0	North	H	SE	1	2
48	SHA_2006.081_FP	3–9 m.	U–C	6467	31	n/a	n/a	n/a	7370	32	-20,1	8,0	North	C	NW	1	n/a
49	SHA_2001.017.02	20–22 y.	M	7006	37	6459	74	547	7370	66	-14,8	15,4	North	scattered	SE	1	3
50	SHA_2005.060.02	40–44 y.	F	6959	39	6458	75	501	7370	67	-15,9	15,1	North	F	SE	1	2
51	SHA_2001.017.01	30–40 y.	M	6915	37	6456	74	459	7368	66	-15,4	14,7	North	scattered	SE	1	3
52	SHA_2007.092	10–12 y.	U–C	6867	35	6454	73	413	7367	65	-15,5	14,4	North	B	NW	1	1
53	SHA_2002.023.04	20+ y.	M	6842	37	6449	74	393	7363	66	-16,3	14,2	North	F	SE	1	2

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
54	SHA_2007.090	18–20 y.	F	7000	40	6449	76	551	7363	68	-15,6	15,5	North	scattered	NW	1	3
55	SHA_2006.080_FP	9–18 m.	U–C	6445	24	n/a	n/a	n/a	7368	33	-20,3	7,1	North	scattered	NW	1	n/a
56	SHA_2004.055.01	35–39 y.	M	6881	38	6440	75	441	7356	66	-15,9	14,6	North	F	SE	1	2
57	SHA_2004.050.03	30–40 y.	M	6911	26	6439	69	472	7356	61	-15,9	14,8	North	G	SE	1	2
58	SHA_2006.075	25–29 y.	M	n/a	n/a	6438	53	656	7357	48	-16,3	16,1	North	D	NW	1	1
59	SHA_2004.056.02	8–10 y.	U–C	6986	27	6433	70	553	7352	62	-15,7	15,5	North	G	SE	1	2
60	SHA_2004.047	20–25 y.	F	n/a	n/a	6432	51	595	7355	47	-16,2	15,8	South	K	S	1	1
61	SHA_2006.069.01	25–30 y.	F	6899	35	6431	73	468	7350	65	-15,8	14,8	North	scattered	SE	1	3
62	SHA_2003.025.01	20–22 y.	F	6897	35	6429	73	468	7349	65	-15,5	14,8	North	F	SE	1	2
63	SHA_2006.076	40–50 y.	M	n/a	n/a	6418	42	572	7351	44	-15,8	15,8	North	D	NW	1	1
64	SHA_2004.040_FP	0.5–1 y.	U–C	6418	24	n/a	n/a	n/a	7355	45	-19,7	2,3	South	scattered	S	1	n/a
65	SHA_2004.054	17–21 y.	F	6939	38	6417	75	522	7340	68	-15,2	15,2	North	F	SE	1	2
66	SHA_2002.024.01	25–35 y.	M	6888	36	6412	74	476	7337	68	-15,5	14,9	North	scattered	SE	1	3
67	SHA_2004.053.02	50+ y.	M	7001	38	6412	75	589	7337	69	-16,0	15,8	North	scattered	SE	1	3
68	SHA_2004.046	25–29 y.	M	n/a	n/a	6411	53	666	7343	51	-15,8	16,4	South	K	S	1	1
69	SHA_2007.087_FP	9–18 m.	U–C	6409	24	n/a	n/a	n/a	7346	49	-15,9	12,0	North	C	NW	1	n/a
70	SHA_2007.095_FP	1.5–2.5 y.	U–C	6407	23	n/a	n/a	n/a	7344	49	-20,7	3,2	North	A	NW	1	n/a
71	SHA_2001.014.02	20–25 y.	F	6937	37	6406	74	531	7333	69	-15,3	15,3	North	H	SE	1	2
72	SHA_2006.083.02	20–30 y.	PF	7095	36	6402	74	693	7330	70	-16,6	16,6	North	C	NW	1	1
73	SHA_2019.116	25–30 y.	M	6840	29	6399	70	441	7666	29	-16,2	14,6	North	L	SE	1	n/a
74	SHA_2005.061.01	25–29 y.	F	6881	40	6396	76	485	7324	73	-15,0	14,9	North	E	SE	1	2
75	SHA_2005.062.02	35–45 y.	U–A	6895	37	6391	74	504	7321	73	-15,8	15,1	North	E	SE	1	2
76	SHA_2006.078.02	25–35	F	n/a	n/a	6386	55	n/a	7326	59	-16,6	14,0	North	scattered	NW	1	3
77	SHA_2006.071	35–45 y.	M	6838	27	6384	70	454	7317	71	-16,3	14,7	North	M	SE	1	1
78	SHA_2001.013.02	35–50 y.	M	6841	36	6377	74	464	7309	77	-16,0	14,8	North	H	SE	1	2
79	SHA_2006.070	40–50 y.	M	6819	37	6376	74	443	7308	77	-15,8	14,6	North	scattered	SE	1	3
80	SHA_2003.026.02	20+ y.	PM	6490	34	6373	73	117	7306	77	-17,4	12,0	South	I	S	1	1
81	SHA_2005.068	45–49 y.	PM	6889	37	6367	74	522	7300	80	-16,0	15,2	North	scattered	SE	1	3
82	SHA_2004.051	20–25 y.	M	6856	40	6356	76	500	7288	85	-16,6	15,1	North	scattered	SE	1	3
83	SHA_2004.053.01	20–25 y.	M	6928	37	6347	74	581	7279	86	-16,2	15,7	North	scattered	SE	1	3
84	SHA_2019.115.01	35+ y.	PF	6868	30	6337	71	531	7700	34	-16,0	15,3	North	L	SE	1	n/a

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
85	SHA_2004.057.01	25–29 y.	F	6943	26	6329	69	614	7259	86	-15,4	16,0	North	G	SE	1	2
86	SHA_2001.013.01	25–35 y.	PF	6824	35	6327	73	497	7255	91	-16,3	15,0	North	H	SE	1	2
87	SHA_2004.052.01	20–24 y.	M	6845	40	6320	76	525	7244	95	-14,7	15,3	North	F	SE	1	2
88	SHA_2002.020.0C	20+ y.	U–A	6938	39	6311	75	627	7233	96	-16,0	16,1	North	G	SE	1	2
89	SHA_2006.078.03	20–25	M	6723	27	6303	70	420	7224	92	-18,0	14,4	North	scattered	NW	1	3
90	SHA_2005.059.02	15–19 y.	PF	6694	39	6297	75	397	7214	98	-17,7	14,2	North	scattered	SE	1	3
91	SHA_2001.016	20–35 y.	F	6826	25	6292	69	534	7209	92	-15,7	15,3	North	scattered	SE	1	3
92	SHA_2007.096.02	30–35 y.	F	6684	26	6282	69	402	7196	93	-16,1	14,3	North	C	NW	1	1
93	SHA_2004.057.02	25–35 y.	F	6882	36	6276	74	606	7186	98	-15,3	15,9	North	G	SE	1	2
94	SHA_2005.063.01	25–29 y.	M	6815	38	6276	75	539	7186	99	-15,6	15,4	North	E	SE	1	2
95	SHA_2008.112	25–35 y.	M	6782	38	6272	75	510	7180	99	-16,3	15,1	North	L	SE	1	3
96	SHA_2001.011.02	30–40 y.	M	6753	36	6260	74	493	7165	98	-16,9	15,0	North	scattered	SE	1	3
97	SHA_2001.018	25–29 y.	M	6891	36	6252	74	639	7155	98	-15,4	16,2	North	G	SE	1	2
98	SHA_2000.008	35–40 y.	M	6874	32	6251	72	623	7154	96	-16,8	16,0	North	H	SE	1	2
99	SHA_2007.086.02	20+ y.	U–A	6815	35	6244	73	571	7146	97	-17,0	15,6	North	B	NW	1	1
100	SHA_2001.015	25–35 y.	M	6807	36	6243	74	564	7144	97	-15,3	15,6	North	H	SE	1	2
101	SHA_2002.020.0B	20+ y.	U–A	6900	40	6240	76	660	7140	99	-16,0	16,3	North	G	SE	1	2
102	SHA_2006.083.01	20–22 y.	M	6620	40	6236	76	384	7136	99	-17,1	14,1	North	C	NW	1	1
103	SHA_2006.078.01	16–18	F	6637	38	6232	75	405	7131	98	-17,5	14,3	North	scattered	NW	1	3
104	SHA_2001.011.01	18–20 y.	F	6688	36	6229	74	459	7128	97	-17,5	14,7	North	scattered	SE	1	3
105	SHA_2005.060.01	50+ y.	M	6819	38	6209	75	610	7106	97	-16,9	15,9	North	F	SE	1	2
106	SHA_2007.086.01	18–20 y.	M	6584	39	6204	75	380	7101	97	-16,5	14,1	North	B	NW	1	1
107	SHA_2001.019	25–30 y.	M	6851	36	6203	74	648	7100	96	-15,0	16,2	North	G	SE	1	2
108	SHA_2001.014.01	25–30 y.	M	6904	36	6185	74	719	7082	96	-15,3	16,8	North	H	SE	1	2
109	SHA_2001.012	20–35 y.	M	6732	37	6155	74	577	7052	99	-16,2	15,7	North	H	SE	1	2
Phase 2																	
110	SHA_2004.049	17–20 y.	PM	n/a	n/a	6041	52	306	6893	78	-16,2	13,5	South	scattered	S	2	5
111	SHA_2008.104	20–35 y.	F	n/a	n/a	6021	50	319	6865	69	-16,3	13,7	North	scattered	SE	2	5
112	SHA_1999.007	20–30 y.	F	6329	33	6001	72	328	6850	96	-16,4	13,7	North	scattered	SE	2	5
113	SHA_2004.050.01	25–35 y.	M	6405	25	5981	69	424	6825	89	-16,5	14,5	North	G	SE	2	5
114	SHA_2003.026.01	20+ y.	PF	6364	36	5976	74	388	6821	95	-17,0	14,2	South	I	S	2	5

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
115	SHA_2008.108.01	35–50 y.	M	6395	32	5956	72	439	6796	91	-16,3	14,6	North	M	SE	2	5
116	SHA_2008.108.03	25–35 y.	M	6373	32	5955	72	418	6795	90	-16,3	14,4	North	M	SE	2	5
117	SHA_2003.030	35–50 y.	M	6338	33	5953	72	385	6792	90	-16,8	14,1	South	J	S	2	5
118	SHA_2004.044.01	50+ y.	PM	n/a	n/a	5952	52	532	6787	66	-15,3	15,3	South	K	S	2	5
119	SHA_2005.064.02	7–10 y.	U–C	6368	23	5925	68	443	6758	85	-16,8	14,6	North	scattered	SE	2	5
120	SHA_2004.042.01	40–45 y.	F	6386	34	5921	73	465	6753	92	-16,7	14,8	South	scattered	S	2	5
121	SHA_2005.064.01	30–39 y.	M	6381	37	5905	74	476	6733	94	-16,5	14,9	North	scattered	SE	2	5
122	SHA_2003.035.0A	25–35 y.	U–A	6396	33	5877	72	519	6695	92	-15,3	15,2	South	scattered	S	2	5
123	SHA_1998.006	16–18 y.	M	6483	37	5875	74	608	6692	94	-16,2	15,9	North	scattered	SE	2	5
124	SHA_2002.023.01	35–45 y.	PM	6500	37	5840	74	660	6646	92	-15,9	16,3	North	F	SE	2	5
125	SHA_2005.059.01	35–39 y.	M	6450	38	5832	75	618	6637	92	-16,0	16,0	North	scattered	SE	2	5
126	SHA_2003.026.03	6–8 y.	U–C	6333	36	5777	74	556	6577	85	-16,6	15,5	South	I	S	2	5
Individuals with radiocarbon dates which cannot be corrected for the FRE																	
127	SHA_2003.027.03	2–3 y.	U–C	6925	35	n/a	n/a	n/a	n/a	n/a	-16,3	14,7	South	I	S	1	n/a
128	SHA_2003.027.04	2–10 m.	U–C	6929	37	n/a	n/a	n/a	n/a	n/a	-17,8	16,3	South	I	S	1	n/a
129	SHA_2003.028	1.5–3 y.	U–C	6417	32	n/a	n/a	n/a	n/a	n/a	-15,1	15,7	South	scattered	S	2	n/a
130	SHA_2003.031	3–5 y.	U–C	7002	33	n/a	n/a	n/a	n/a	n/a	-15,5	14,7	South	J	S	1	n/a
131	SHA_2003.038	2–3 y.	U–C	6935	26	n/a	n/a	n/a	n/a	n/a	-16,4	14,3	South	J	S	1	n/a
132	SHA_2004.040	0.5–1 y.	U–C	6779	33	n/a	n/a	n/a	n/a	n/a	-15,8	16,1	South	scattered	S	1	n/a
133	SHA_2004.042.02	50+ y.	F	6847	13	n/a	n/a	n/a	n/a	n/a	-17,9	10,7	South	scattered	S	1	n/a
134	SHA_2004.048.02	2–3 y.	U–C	6823	35	n/a	n/a	n/a	n/a	n/a	-17,2	14,4	South	scattered	S	m.d.	n/a
135	SHA_2004.056.01	3–5 y.	U–C	6416	22	n/a	n/a	n/a	n/a	n/a	-15,5	15,4	North	G	SE	2	n/a
136	SHA_2005.061.03	3–9 m.	U–C	6877	34	n/a	n/a	n/a	n/a	n/a	-15,6	17,6	North	E	SE	1	n/a
137	SHA_2005.063.03	0–6 m.	U–C	6807	34	n/a	n/a	n/a	n/a	n/a	-16,3	17,2	North	E	SE	1	n/a
138	SHA_2005.066.02	9–18 m.	U–C	6890	40	n/a	n/a	n/a	n/a	n/a	-17,6	16,9	North	E	SE	1	n/a
139	SHA_2006.069.03	9–18 m.	U–C	6965	40	n/a	n/a	n/a	n/a	n/a	-14,7	17,9	North	scattered	SE	1	n/a
140	SHA_2006.072	1.5–2.5 y.	U–C	6872	37	n/a	n/a	n/a	n/a	n/a	-16,7	15,8	North	scattered	SE	1	n/a
141	SHA_2006.080	9–18 m.	U–C	6692	39	n/a	n/a	n/a	n/a	n/a	-16,0	16,3	North	scattered	NW	1 or 2	n/a
142	SHA_2006.081	3–9 m.	U–C	6859	38	n/a	n/a	n/a	n/a	n/a	-16,8	14,7	North	C	NW	1	n/a
143	SHA_2006.082	1–2 y.	U–C	7040	40	n/a	n/a	n/a	n/a	n/a	-18,4	15,3	North	scattered	SE	1	n/a

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
144	SHA_2007.087	9–18 m.	U–C	6895	40	n/a	n/a	n/a	n/a	n/a	-15,8	16,8	North	C	NW	1	n/a
145	SHA_2007.089	2–3 y.	U–C	7216	37	n/a	n/a	n/a	n/a	n/a	-14,8	15,8	North	scattered	NW	1	n/a
146	SHA_2007.091	9–18 m.	U–C	6505	38	n/a	n/a	n/a	n/a	n/a	-16,8	16,1	North	A	NW	2	n/a
147	SHA_2007.094	3–4 y.	U–C	6807	35	n/a	n/a	n/a	n/a	n/a	-15,7	13,8	North	B	NW	1	n/a
148	SHA_2007.095	1.5–2.5 y.	U–C	6864	37	n/a	n/a	n/a	n/a	n/a	-15,9	15,7	North	A	NW	1	n/a
149	SHA_2019.115.02	1.5–2.0 y.	U–C	6836	31	n/a	n/a	n/a	n/a	n/a	-16,4	18,1	North	L	SE	1	n/a
Individuals not dated because of the lack of suitable skeletal materials																	
150	SHA_2002.020.01	30–60 y.	PM										North	G	SE		
151	SHA_2002.020.03	20−35 y.	PF										North	G	SE		
152	SHA_2002.020.04	20+ y.	U–A										North	G	SE		
153	SHA_2002.020.05	20+ y.	U–A										North	G	SE		
154	SHA_2003.025.05	20+ y.	U–A										North	F	SE		
155	SHA_2003.026.05	14–18 y.	U–A										South	I	S		
156	SHA_2003.035.01	25−35 y.	M										South	scattered	S		
157	SHA_2003.035.02	20+ y.	U–A										South	scattered	S		
158	SHA_2003.036	25−35 y.	PM										South	I	S		
159	SHA_2003.037	4−6 y.	U–C										South	J	S		
160	SHA_2004.048.04	20−35 y.	U–A										South	scattered	S		
161	SHA_2004.048.05	20+ y.	U–A										South	scattered	S		
162	SHA_2004.052.02	25–29 y.	M										North	F	SE		2
163	SHA_2007.098	15+ y.	U–A										North	scattered	NW		
164	SHA_2007.099	2−4 y.	U–C										North	A	NW		

TABLE S.3. Radiocarbon and Stable Isotope Data (Master ID Sort)

Results are sorted by Master ID.
Individuals with Master_IDs followed by “FP” are dated by faunal proxy samples.
The total number of C14 dates generated for Shamanka II is higher than what is shown in this supplement because a number of burials were dated multiple times. Weber et al. 2016a provides detailed explanation of how multiple dates for the same individual were handled.
Sex categories: M, Male; PM, Probable Male; F, Female; PF, Probable Female; U–A, Undetermined Sex (Adolescent or Adult); U–C, Undetermined Sex (Child).

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
1	SHA_1998.004	35–45 y.	M	6906	38	6506	75	400	7413	72	-15,9	14,3	North	scattered	SE	1	3
2	SHA_1998.006	16–18 y.	M	6483	37	5875	74	608	6692	94	-16,2	15,9	North	scattered	SE	2	5
3	SHA_1999.007	20–30 y.	F	6329	33	6001	72	328	6850	96	-16,4	13,7	North	scattered	SE	2	5
4	SHA_2000.008	35–40 y.	M	6874	32	6251	72	623	7154	96	-16,8	16,0	North	H	SE	1	2
5	SHA_2000.010	25–35 y.	M	6867	35	6508	73	359	7415	71	-16,8	13,9	North	G	SE	1	2
6	SHA_2001.011.01	18–20 y.	F	6688	36	6229	74	459	7128	97	-17,5	14,7	North	scattered	SE	1	3
7	SHA_2001.011.02	30–40 y.	M	6753	36	6260	74	493	7165	98	-16,9	15,0	North	scattered	SE	1	3
8	SHA_2001.012	20–35 y.	M	6732	37	6155	74	577	7052	99	-16,2	15,7	North	H	SE	1	2
9	SHA_2001.013.01	25–35 y.	PF	6824	35	6327	73	497	7255	91	-16,3	15,0	North	H	SE	1	2
10	SHA_2001.013.02	35–50 y.	M	6841	36	6377	74	464	7309	77	-16,0	14,8	North	H	SE	1	2
11	SHA_2001.013.03	18–19 y.	M	6837	27	6467	70	370	7376	64	-15,0	14,0	North	H	SE	1	2
12	SHA_2001.014.01	25–30 y.	M	6904	36	6185	74	719	7082	96	-15,3	16,8	North	H	SE	1	2
13	SHA_2001.014.02	20–25 y.	F	6937	37	6406	74	531	7333	69	-15,3	15,3	North	H	SE	1	2
14	SHA_2001.015	25–35 y.	M	6807	36	6243	74	564	7144	97	-15,3	15,6	North	H	SE	1	2
15	SHA_2001.016	20–35 y.	F	6826	25	6292	69	534	7209	92	-15,7	15,3	North	scattered	SE	1	3
16	SHA_2001.017.01	30–40 y.	M	6915	37	6456	74	459	7368	66	-15,4	14,7	North	scattered	SE	1	3
17	SHA_2001.017.02	20–22 y.	M	7006	37	6459	74	547	7370	66	-14,8	15,4	North	scattered	SE	1	3
18	SHA_2001.018	25–29 y.	M	6891	36	6252	74	639	7155	98	-15,4	16,2	North	G	SE	1	2
19	SHA_2001.019	25–30 y.	M	6851	36	6203	74	648	7100	96	-15,0	16,2	North	G	SE	1	2
20	SHA_2002.020.01	30–60 y.	PM										North	G	SE		
21	SHA_2002.020.02	25–35 y.	F	6800	40	6361	76	439	7281	88	-16,0	14,6	North	G	SE	1	
22	SHA_2002.020.03	20−35 y.	PF										North	G	SE		
23	SHA_2002.020.04	20+ y.	U–A										North	G	SE		
24	SHA_2002.020.05	20+ y.	U–A										North	G	SE		
25	SHA_2002.020.0A	20+ y.	U–A	6940	40	6606	76	334	7501	59	-16,8	13,7	North	G	SE	1	2

No.	MASTER_ID	Age	Sex	Date BP	±	Corr Date BP	±	DateDiff	Mean Cal Date BP	±	$\delta^{13}C$	$\delta^{15}N$	Sector	Row	Cluster	Phase	Diet Group
26	SHA_2002.020.0B	20+ y.	U–A	6900	40	6240	76	660	7140	99	-16,0	16,3	North	G	SE	1	2
27	SHA_2002.020.0C	20+ y.	U–A	6938	39	6311	75	627	7233	96	-16,0	16,1	North	G	SE	1	2
28	SHA_2002.021.01	25–30 y.	M	6845	40	6682	76	163	7552	60	-16,4	12,4	North	F	SE	1	2
29	SHA_2002.021.02	25–30 y.	M	6972	34	6586	73	386	7488	59	-16,5	14,1	North	F	SE	1	2
30	SHA_2002.021.03	16–18 y.	M	6955	38	6537	75	418	7445	71	-15,6	14,4	North	F	SE	1	2
31	SHA_2002.022	19–22 y.	M	n/a	n/a	6512	52	571	7420	57	-15,9	15,6	North	F	SE	1	2
32	SHA_2002.023.01	35–45 y.	PM	6500	37	5840	74	660	6646	92	-15,9	16,3	North	F	SE	2	5
33	SHA_2002.023.02	20+ y.	PF	7128	39	6489	75	639	7396	71	-15,4	16,2	North	F	SE	1	2
34	SHA_2002.023.03	20+ y.	U–A	6900	34	6612	73	288	7505	56	-17,2	13,4	North	F	SE	1	2
35	SHA_2002.023.04	20+ y.	M	6842	37	6449	74	393	7363	66	-16,3	14,2	North	F	SE	1	2
36	SHA_2002.023.05	20+ y.	M	7021	35	6573	73	448	7478	62	-15,9	14,6	North	F	SE	1	2
37	SHA_2002.024.01	25–35 y.	M	6888	36	6412	74	476	7337	68	-15,5	14,9	North	scattered	SE	1	3
38	SHA_2002.024.02	12–15 y.	U–A	6901	34	6479	73	422	7387	68	-15,4	14,4	North	scattered	SE	1	3
39	SHA_2003.025.01	20–22 y.	F	6897	35	6429	73	468	7349	65	-15,5	14,8	North	F	SE	1	2
40	SHA_2003.025.02	17–21 y.	U–A	7117	37	6566	74	551	7472	65	-16,0	15,5	North	F	SE	1	2
41	SHA_2003.025.03	20+ y.	PF	7086	34	6911	73	175	7756	75	-16,0	12,5	North	F	SE	1	2
42	SHA_2003.025.05	20+ y.	U–A										North	F	SE		
43	SHA_2003.026.01	20+ y.	PF	6364	36	5976	74	388	6821	95	-17,0	14,2	South	I	S	2	5
44	SHA_2003.026.02	20+ y.	PM	6490	34	6373	73	117	7306	77	-17,4	12,0	South	I	S	1	1
45	SHA_2003.026.03	6–8 y.	U–C	6333	36	5777	74	556	6577	85	-16,6	15,5	South	I	S	2	5
46	SHA_2003.026.05	14–18 y.	U–A										South	I	S		
47	SHA_2003.027.01	35–50 y.	M	6939	33	6616	72	323	7507	55	-16,8	13,6	South	I	S	1	1
48	SHA_2003.027.02	25–30 y.	M	6950	39	6503	75	447	7410	72	-16,7	14,6	South	I	S	1	1
49	SHA_2003.027.03	2–3 y.	U–C	6925	35	n/a	n/a	n/a	n/a	n/a	-16,3	14,7	South	I	S	1	n/a
50	SHA_2003.027.04	2–10 m.	U–C	6929	37	n/a	n/a	n/a	n/a	n/a	-17,8	16,3	South	I	S	1	n/a
51	SHA_2003.028	1.5–3 y.	U–C	6417	32	n/a	n/a	n/a	n/a	n/a	-15,1	15,7	South	scattered	S	2	n/a
52	SHA_2003.029	20–30 y.	M	6838	36	6563	74	275	7469	65	-16,2	13,3	South	J	S	1	1
53	SHA_2003.030	35–50 y.	M	6338	33	5953	72	385	6792	90	-16,8	14,1	South	J	S	2	5
54	SHA_2003.031	3–5 y.	U–C	7002	33	n/a	n/a	n/a	n/a	n/a	-15,5	14,7	South	J	S	1	n/a
55	SHA_2003.032	35–45 y.	M	6921	35	6492	73	429	7399	70	-16,1	14,5	South	scattered	S	1	4
56	SHA_2003.033	35–45 y.	M	6913	34	6522	73	391	7430	71	-16,4	14,2	South	J	S	1	1

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57	SHA_2003.034	35–45 y.	M	6970	35	6609	73	361	7503	56	-16,6	14,0	South	J	S	1	1
58	SHA_2003.035.01	25−35 y.	M										South	scattered	S		
59	SHA_2003.035.02	20+ y.	U–A										South	scattered	S		
60	SHA_2003.035.0A	25–35 y.	U–A	6396	33	5877	72	519	6695	92	-15,3	15,2	South	scattered	S	2	5
61	SHA_2003.036	25−35 y.	PM										South	I	S		
62	SHA_2003.037	4−6 y.	U–C										South	J	S		
63	SHA_2003.038	2–3 y.	U–C	6935	26	n/a	n/a	n/a	n/a	n/a	-16,4	14,3	South	J	S	1	n/a
64	SHA_2004.039	40–44 y.	M	n/a	n/a	6500	42	408	7405	49	-16,4	14,2	South	scattered	S	1	4
65	SHA_2004.040_FP	0.5–1 y.	U–C	6418	24	n/a	n/a	n/a	7355	45	-19,7	2,3	South	scattered	S	1	n/a
66	SHA_2004.040	0.5–1 y.	U–C	6779	33	n/a	n/a	n/a	n/a	n/a	-15,8	16,1	South	scattered	S	1	n/a
67	SHA_2004.041	30–39 y.	M	n/a	n/a	6567	53	378	7478	47	-16,9	14,1	South	scattered	S	1	4
68	SHA_2004.042.01	40–45 y.	F	6386	34	5921	73	465	6753	92	-16,7	14,8	South	scattered	S	2	5
69	SHA_2004.042.02	50+ y.	F	6847	13	n/a	n/a	n/a	n/a	n/a	-17,9	10,7	South	scattered	S	1	n/a
70	SHA_2004.043	35–50 y.	PF	7046	35	6603	73	443	7499	57	-17,0	14,6	South	K	S	1	1
71	SHA_2004.044.01	50+ y.	PM	n/a	n/a	5952	52	532	6787	66	-15,3	15,3	South	K	S	2	5
72	SHA_2004.044.02	20+ y.	M	6901	35	6533	73	368	7441	70	-16,9	14,0	South	K	S	1	1
73	SHA_2004.045	25–35 y.	M	6881	36	6568	74	313	7474	64	-16,4	13,6	South	scattered	S	1	4
74	SHA_2004.046	25–29 y.	M	n/a	n/a	6411	53	666	7343	51	-15,8	16,4	South	K	S	1	1
75	SHA_2004.047	20–25 y.	F	n/a	n/a	6432	51	595	7355	47	-16,2	15,8	South	K	S	1	1
76	SHA_2004.048.01	50+ y.	M	n/a	n/a	6469	51	459	7375	48	-16,4	14,8	South	scattered	S	1	4
77	SHA_2004.048.02	2–3 y.	U–C	6823	35	n/a	n/a	n/a	n/a	n/a	-17,2	14,4	South	scattered	S	m.d.	n/a
78	SHA_2004.048.04	20−35 y.	U–A										South	scattered	S		
79	SHA_2004.048.05	20+ y.	U–A										South	scattered	S		
80	SHA_2004.049	17–20 y.	PM	n/a	n/a	6041	52	306	6893	78	-16,2	13,5	South	scattered	S	2	5
81	SHA_2004.050.01	25–35 y.	M	6405	25	5981	69	424	6825	89	-16,5	14,5	North	G	SE	2	5
82	SHA_2004.050.02	25–29 y.	M	6875	26	6539	69	336	7448	67	-16,9	13,7	North	G	SE	1	2
83	SHA_2004.050.03	30–40 y.	M	6911	26	6439	69	472	7356	61	-15,9	14,8	North	G	SE	1	2
84	SHA_2004.051	20–25 y.	M	6856	40	6356	76	500	7288	85	-16,6	15,1	North	scattered	SE	1	3
85	SHA_2004.052.00	20–29 y.	M	6892	37	6341	74	551	7260	91	-15,4	15,5	North	F	SE	1	2
86	SHA_2004.052.01	20–24 y.	M	6845	40	6320	76	525	7244	95	-14,7	15,3	North	F	SE	1	2
87	SHA_2004.052.02	25–29 y.	M										North	F	SE		2

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88	SHA_2004.053.01	20–25 y.	M	6928	37	6347	74	581	7279	86	-16,2	15,7	North	scattered	SE	1	3
89	SHA_2004.053.02	50+ y.	M	7001	38	6412	75	589	7337	69	-16,0	15,8	North	scattered	SE	1	3
90	SHA_2004.054	17–21 y.	F	6939	38	6417	75	522	7340	68	-15,2	15,2	North	F	SE	1	2
91	SHA_2004.055.01	35–39 y.	M	6881	38	6440	75	441	7356	66	-15,9	14,6	North	F	SE	1	2
92	SHA_2004.055.02	5–7 y.	U–C	7017	39	6472	75	545	7381	69	-16,0	15,4	North	F	SE	1	2
93	SHA_2004.056.01	3–5 y.	U–C	6416	22	n/a	n/a	n/a	n/a	n/a	-15,5	15,4	North	G	SE	2	n/a
94	SHA_2004.056.02	8–10 y.	U–C	6986	27	6433	70	553	7352	62	-15,7	15,5	North	G	SE	1	2
95	SHA_2004.057.01	25–29 y.	F	6943	26	6329	69	614	7259	86	-15,4	16,0	North	G	SE	1	2
96	SHA_2004.057.02	25–35 y.	F	6882	36	6276	74	606	7186	98	-15,3	15,9	North	G	SE	1	2
97	SHA_2004.058	35–45 y.	M	6980	28	6628	70	352	7515	53	-16,8	13,9	North	G	SE	1	2
98	SHA_2005.059.01	35–39 y.	M	6450	38	5832	75	618	6637	92	-16,0	16,0	North	scattered	SE	2	5
99	SHA_2005.059.02	15–19 y.	PF	6694	39	6297	75	397	7214	98	-17,7	14,2	North	scattered	SE	1	3
100	SHA_2005.060.01	50+ y.	M	6819	38	6209	75	610	7106	97	-16,9	15,9	North	F	SE	1	2
101	SHA_2005.060.02	40–44 y.	F	6959	39	6458	75	501	7370	67	-15,9	15,1	North	F	SE	1	2
102	SHA_2005.061.01	25–29 y.	F	6881	40	6396	76	485	7324	73	-15,0	14,9	North	E	SE	1	2
103	SHA_2005.061.02	35–45 y.	M	6915	38	6514	75	401	7421	73	-15,9	14,3	North	E	SE	1	2
104	SHA_2005.061.03	3–9 m.	U–C	6877	34	n/a	n/a	n/a	n/a	n/a	-15,6	17,6	North	E	SE	1	n/a
105	SHA_2005.062.01	35–45 y.	PF	6862	37	6505	74	357	7412	72	-16,0	13,9	North	E	SE	1	2
106	SHA_2005.062.02	35–45 y.	U–A	6895	37	6391	74	504	7321	73	-15,8	15,1	North	E	SE	1	2
107	SHA_2005.062.03	20+ y.	PF	7022	39	6580	75	442	7483	62	-15,8	14,6	North	E	SE	1	2
108	SHA_2005.062.04	20+ y.	PM	7005	38	6521	75	484	7428	73	-15,7	14,9	North	E	SE	1	2
109	SHA_2005.062.05	45–59 y.	M	6859	36	6525	74	334	7432	72	-16,7	13,7	North	E	SE	1	2
110	SHA_2005.063.01	25–29 y.	M	6815	38	6276	75	539	7186	99	-15,6	15,4	North	E	SE	1	2
111	SHA_2005.063.02	25–35 y.	M	6908	32	6474	72	434	7382	66	-15,0	14,5	North	E	SE	1	2
112	SHA_2005.063.03	0–6 m.	U–C	6807	34	n/a	n/a	n/a	n/a	n/a	-16,3	17,2	North	E	SE	1	n/a
113	SHA_2005.064.01	30–39 y.	M	6381	37	5905	74	476	6733	94	-16,5	14,9	North	scattered	SE	2	5
114	SHA_2005.064.02	7–10 y.	U–C	6368	23	5925	68	443	6758	85	-16,8	14,6	North	scattered	SE	2	5
115	SHA_2005.065	50+ y.	M	6979	30	6561	71	418	7469	63	-16,4	14,4	North	F	SE	1	2
116	SHA_2005.066.01	25–35 y.	F	6967	28	6654	70	313	7531	54	-17,1	13,6	North	E	SE	1	2
117	SHA_2005.066.02	9–18 m.	U–C	6890	40	n/a	n/a	n/a	n/a	n/a	-17,6	16,9	North	E	SE	1	n/a
118	SHA_2005.067	7–9 y.	U–C	6885	40	6501	76	384	7408	73	-17,6	14,1	North	E	SE	1	2

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119	SHA_2005.068	45–49 y.	PM	6889	37	6367	74	522	7300	80	-16,0	15,2	North	scattered	SE	1	3
120	SHA_2006.069.01	25–30 y.	F	6899	35	6431	73	468	7350	65	-15,8	14,8	North	scattered	SE	1	3
121	SHA_2006.069.02	20–25 y.	F	6953	39	6485	75	468	7392	70	-14,7	14,8	North	scattered	SE	1	3
122	SHA_2006.069.03	9–18 m.	U–C	6965	40	n/a	n/a	n/a	n/a	n/a	-14,7	17,9	North	scattered	SE	1	n/a
123	SHA_2006.070	40–50 y.	M	6819	37	6376	74	443	7308	77	-15,8	14,6	North	scattered	SE	1	3
124	SHA_2006.071	35–45 y.	M	6838	27	6384	70	454	7317	71	-16,3	14,7	North	M	SE	1	1
125	SHA_2006.072	1.5–2.5 y.	U–C	6872	37	n/a	n/a	n/a	n/a	n/a	-16,7	15,8	North	scattered	SE	1	n/a
126	SHA_2006.073	16–18 y.	F	7010	45	6630	78	380	7516	59	-16,5	14,1	North	scattered	NW	1	3
127	SHA_2006.074	18–20 y.	M	6948	39	6514	75	434	7421	73	-16,0	14,5	North	D	NW	1	1
128	SHA_2006.075	25–29 y.	M	n/a	n/a	6438	53	656	7357	48	-16,3	16,1	North	D	NW	1	1
129	SHA_2006.076	40–50 y.	M	n/a	n/a	6418	42	572	7351	44	-15,8	15,8	North	D	NW	1	1
130	SHA_2006.077	30–39 y.	F	7025	40	6570	76	455	7475	65	-16,7	14,7	North	D	NW	1	1
131	SHA_2006.078.01	16–18	F	6637	38	6232	75	405	7131	98	-17,5	14,3	North	scattered	NW	1	3
132	SHA_2006.078.02	25–35	F	n/a	n/a	6386	55	n/a	7326	59	-16,6	14,0	North	scattered	NW	1	3
133	SHA_2006.078.03	20–25	M	6723	27	6303	70	420	7224	92	-18,0	14,4	North	scattered	NW	1	3
134	SHA_2006.078.04	35–50	F	7012	39	6532	75	480	7440	72	-15,8	14,9	North	scattered	NW	1	3
135	SHA_2006.079	35–50 y.	PF	7063	39	6566	75	497	7472	66	-15,2	15,0	North	scattered	NW	1	3
136	SHA_2006.080_FP	9–18 m.	U–C	6445	24	n/a	n/a	n/a	7368	33	-20,3	7,1	North	scattered	NW	1	n/a
137	SHA_2006.080	9–18 m.	U–C	6692	39	n/a	n/a	n/a	n/a	n/a	-16,0	16,3	North	scattered	NW	1 or 2	n/a
138	SHA_2006.081_FP	3–9 m.	U–C	6467	31	n/a	n/a	n/a	7370	32	-20,1	8,0	North	C	NW	1	n/a
139	SHA_2006.081	3–9 m.	U–C	6859	38	n/a	n/a	n/a	n/a	n/a	-16,8	14,7	North	C	NW	1	n/a
140	SHA_2006.082	1–2 y.	U–C	7040	40	n/a	n/a	n/a	n/a	n/a	-18,4	15,3	North	scattered	SE	1	n/a
141	SHA_2006.083.01	20–22 y.	M	6620	40	6236	76	384	7136	99	-17,1	14,1	North	C	NW	1	1
142	SHA_2006.083.02	20–30 y.	PF	7095	36	6402	74	693	7330	70	-16,6	16,6	North	C	NW	1	1
143	SHA_2007.085	25–35 y.	M	6935	39	6605	75	330	7500	58	-15,6	13,7	North	M	SE	1	1
144	SHA_2007.086.01	18–20 y.	M	6584	39	6204	75	380	7101	97	-16,5	14,1	North	B	NW	1	1
145	SHA_2007.086.02	20+ y.	U–A	6815	35	6244	73	571	7146	97	-17,0	15,6	North	B	NW	1	1
146	SHA_2007.087_FP	9–18 m.	U–C	6409	24	n/a	n/a	n/a	7346	49	-15,9	12,0	North	C	NW	1	n/a
147	SHA_2007.087	9–18 m.	U–C	6895	40	n/a	n/a	n/a	n/a	n/a	-15,8	16,8	North	C	NW	1	n/a
148	SHA_2007.088	6–8 y.	U–C	6910	35	6580	73	330	7483	61	-16,6	13,7	North	A	NW	1	1
149	SHA_2007.089	2–3 y.	U–C	7216	37	n/a	n/a	n/a	n/a	n/a	-14,8	15,8	North	scattered	NW	1	n/a

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150	SHA_2007.090	18–20 y.	F	7000	40	6449	76	551	7363	68	-15,6	15,5	North	scattered	NW	1	3
151	SHA_2007.091	9–18 m.	U–C	6505	38	n/a	n/a	n/a	n/a	n/a	-16,8	16,1	North	A	NW	2	n/a
152	SHA_2007.092	10–12 y.	U–C	6867	35	6454	73	413	7367	65	-15,5	14,4	North	B	NW	1	1
153	SHA_2007.093.02	35–40 y.	F	7012	37	6561	74	451	7468	66	-16,4	14,7	North	C	NW	1	1
154	SHA_2007.094	3–4 y.	U–C	6807	35	n/a	n/a	n/a	n/a	n/a	-15,7	13,8	North	B	NW	1	n/a
155	SHA_2007.095_FP	1.5–2.5 y.	U–C	6407	23	n/a	n/a	n/a	7344	49	-20,7	3,2	North	A	NW	1	n/a
156	SHA_2007.095	1.5–2.5 y.	U–C	6864	37	n/a	n/a	n/a	n/a	n/a	-15,9	15,7	North	A	NW	1	n/a
157	SHA_2007.096.02	30–35 y.	F	6684	26	6282	69	402	7196	93	-16,1	14,3	North	C	NW	1	1
158	SHA_2007.098	15+ y.	U–A										North	scattered	NW		
159	SHA_2007.099	2–4 y.	U–C										North	A	NW		
160	SHA_2008.104	20–35 y.	F	n/a	n/a	6021	50	319	6865	69	-16,3	13,7	North	scattered	SE	2	5
161	SHA_2008.108.01	35–50 y.	M	6395	32	5956	72	439	6796	91	-16,3	14,6	North	M	SE	2	5
162	SHA_2008.108.03	25–35 y.	M	6373	32	5955	72	418	6795	90	-16,3	14,4	North	M	SE	2	5
163	SHA_2008.112	25–35 y.	M	6782	38	6272	75	510	7180	99	-16,3	15,1	North	L	SE	1	3
164	SHA_2019.115.01	35+ y.	PF	6868	30	6337	71	531	7700	34	-16,0	15,3	North	L	SE	1	n/a
165	SHA_2019.115.02	1.5–2.0 y.	U–C	6836	31	n/a	n/a	n/a	n/a	n/a	-16,4	18,1	North	L	SE	1	n/a
166	SHA_2019.116	25–30 y.	M	6840	29	6399	70	441	7666	29	-16,2	14,6	North	L	SE	1	n/a

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Andrzej W. **Weber**
Vladimir I. **Bazaliiskii**
Erin **Jessup**

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