ORIENTATION OF GRAVES AND SKELETONS IN THE EARLY BRONZE AGE NECROPOLIS OF MOKRIN

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Abstract

The presence of the skeleton/grave orientation toward the cardinal points of azimuth has been confirmed for several prehistoric necropoles worldwide. In this paper the authors have studied orientation data acquired from the Bronze Age necropolis in Mokrin hoping to get more insight on the burial ritual of this ancient population.

In Mokrin cemetery (2300–2100 BC) the orientation of 146 graves and 171 skeletons were studied. Their angular distribution has been determined. Our results show that the graves and skeletons were oriented in north–south or south–north direction, respectively. The faces of the dead pointed toward the sunrise.

General Description

The Early Bronze Age necropolis of Mokrin is situated near the village of the same name in eastern Banat (Serbia), 13 km north of Kikinda, in the immediate vicinity of Yugoslav–Romanian border (45°55′ north latitude, 20°22′ east longitude) (See the Map at the end of the volume.)

The necropolis is bounded by the river Tisa from the west, the river Moris from the north, the old Begej irrigation channel from the south, and the Romanian border from the east. It is situated on the northern slope of a sand rock, and therefore well protected from floods and underground waters. The choice of such a valuable piece of land together with the funeral rites indicate the importance the survivors attributed to the proper treatment of their deceased in Mokrin.

Research history

The necropolis of Mokrin, with its 312 explored graves and the material they yielded, represents one of the most explored and documented prehistoric necropoles in Serbia. In course of the eight years of fieldwork (1953, 1958–60, 1963–65, 1967, 1969–70) total area of 10.080 m^2 was investigated. The northern, northeastern and southeastern part of the necropolis that remained unexplored is believed to contain another 50 to 100 unexcavated graves (Girić 1971:34).

The examination of the anthropological material from the Mokrin necropolis has been conducted by two separate teams: Gy. Farkas and P. Lipták (1971), and I. Lengyel (1972). They have carried out *both morphological and osteo-chemical analyses*. Their data has been used in this paper for analyzing the orientation of skeletons in respect to their sex.

Taking into consideration the number of excavated graves, the satisfactory degree of the preservation of the skeletal material (Farkas and Lipták 1971:240) and the clear demarcation of the grave pit contours, the Mokrin necropolis can give enough data for grave and skeletal orientation to be analysed.

Relative and absolute chronology

The Mokrin necropolis has not been in extensive use. It is dated between 2300–2100 BC and belongs to the Early Bronze Age period. Grave goods are dated in the interval between BIb and the beginning of the BIIIa phase of the Bronze Age according to the chronology of A. Mozsolics, i.e., the end of I and whole II and III Bronze Age period according to I. Bóna. Usage of the necropolis in Mokrin was suddenly interrupted in the BIII phase (A. Mozsolics 1967:127-184), i.e. III period of the Early Bronze Age (I. Bóna 1975) (Girić 197 1:235–237).

Burial rites

The people of Mokrin practiced skeletal burials with the dead placed on a side in a contracted or flexed position, with arms bent at the elbow and hands at the shoulder level or just in front of the face (Girić 1971:196). They were laid in the grave-pits of fairly rectangular shape with an extra space left near the feet for grave goods to be placed (Girić 1971:193–194). Most of the burials are single ones with the exception of four graves: three graves (22, 257, 308) which contained a child and an adult (grown up individuals of both sexes were presented) and one grave (122) containing 2 adults (a man and a woman) and a child. Since adults were of approximately the same age it has been assumed that these graves represent family burials (Girić 1971:197).

Apart skeletal inhumation, cremation, which corresponds to the early phase of *Moris culture* (widely known as *Maros culture*) as well, has also been detected in the Mokrin necropolis (five graves). This burial practice, uncharacteristic for Mokrin, is believed to have derived from Nagyrév or Kisapostag group (Tasić 1974:197–198).

Orientation of Skeletons and Graves

By studying sketches of the graves and taking into account the sex of the deceased we can observe the existence of a specific pattern of burial: male skeletons *lay on their left body side and are orientated with their heads toward the north*, while female skeletons *lay on their right side with heads orientated toward the south*. With bodies placed and orientated in this way heads of the skeletons of both sexes faced east. A certain number of exceptions to this rule can be noticed and we can classify them in the next four categories:

1. correctly orientated (male skeletons oriented with heads toward north, female skeletons with heads toward south) and correctly placed skeletons (they face east),
2. correctly orientated, but incorrectly placed skeletons,
3. incorrectly orientated, but correctly placed skeletons and
4. incorrectly orientated and incorrectly placed skeletons.

Skeletal orientation analysis

From the grave sketches (Girić 1971:Tab. I–XXXIII) the orientation of 171 skeletons was analyzed (see Tables 3 and 4 attached to the end of this paper). For this purpose the angle between skeleton axis, determined by spinal column, and geographical north was measured clockwise (from north to east). Results acquired this way are shown as histograms in Figures 1 and 2.

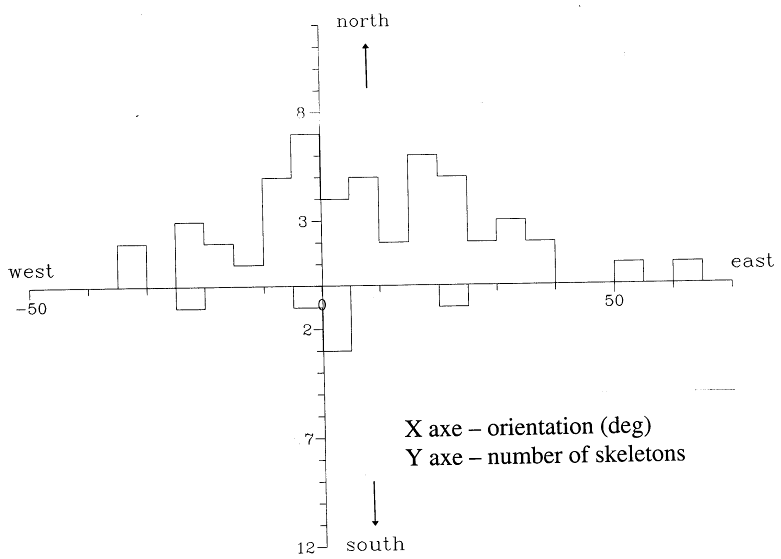

Figure 1: Orientation of male skeletons at Mokrin nekropolis

By analyzing histograms the angular distribution of the skeleton orientation has been determined: male skeletons are orientated heads toward the north with the highest deviation of around 40° toward east and west (Fig. 1). Female skeletons are orientated heads toward the south with the highest deviation of 50° toward the west (Fig. 2).

Out of the total number of male skeletons analyzed (72) 63 are orientated toward north. Nine skeletons orientated toward south are the exception (skeletons 1, 79, 147, 122S, 202, 208, 210, 226 and 281) (Tab. 1).

In case of the skeleton 1, chemical and morphological analyses haven't been carried out and consequently this skeleton has not been taken into the consideration. For skeletons 147 and 210 *chemical and morphological* analyses gave different results (Lengyel 1972:89). The position in which they lay in the grave (right side) indicates the female burial ritual so it could be speculated that these skeletons were indeed of female sex. Gy. Farkas and

Table 1: Anthropological analysis of male skeletons orientated toward south

No. of grave	Chemical analysis of Lengyel	Morphological analysis of Lengyel	Morphological analysis of Farkas and Lipták	Body position	Face orientation
1	-	-	-	right	east
79	-	-	male	right	east
147	female	male	male	right	east
122S	male	male	male	right	east
202	male	male	male	left	west
208	male	male	male	left	west
210	female	male	male	right	east
226	-	-	male	left	west
281	male	male	male	right	east

P. Lipták (1971:241) came to the same conclusion and subsequently these skeletons were not used in the analysis.

Skeletons 10 and 167 belong to a different exception group. Skeleton 10 is male by both I. Lengyel's (1972:88) and Gy. Farkas–P. Lipták's (1971:119) analyses. Skeleton 167 is also determined as male by morphological analyses of Gy. Farkas and P. Lipták (1971:119). Both skeletons are correctly orientated, but incorrectly placed in the grave, i.e., they face west.

Skeletons 79, 122S and 281 are definitely male, which was confirmed by chemical and morphological analyses of Lengyel (1972:89) for skeletons 122S and 281, and morphological analyses of Gy. Farkas and P. Lipták (1971, Tab. 1) for all three skeletons. These skeletons were placed on the right hand side, so they were both orientated and placed as female skeletons. They belong into the category of incorrectly orientated, but correctly placed skeletons facing the east.

Skeletons 202 and 208 are male (chemical and morphological analyses of Lengyel (1972:89) and morphological analyses of Gy. Farkas and P. Lipták (1971:134, 137)). For skeleton 226 we only have morphological analysis of Gy. Farkas and P. Lipták (1971:144) according to which this skeleton is male (Tab. 1). These three skeletons are incorrectly orientated and incorrectly placed with their faces turned to west. There is no visible trace of any attempt to turn their heads toward east by force.

Relations between correctly orientated and correctly placed skeletons and those listed above have been analyzed in order to detect any feature which could help us understand and explain the reasons for which these skeletons were excluded from the usual manner of burial. For this purpose the richness of grave goods, age and the position of hands was analyzed. *No differences were detected.*

Orientation of 99 female skeletons was also analyzed. Out of this number 88 were correctly orientated (head toward south) and correctly laid (facing east). Eleven skeletons show deviation from this pattern. These are skeletons 62, 63, 64, 94, 95, 127, 13 2, 159, 266, 272 and 299 (Tab. 2). Sex of these skeletons was determined by Gy. Farkas and P. Lipták's *morphological analysis solely* (1971, Tab. 1).

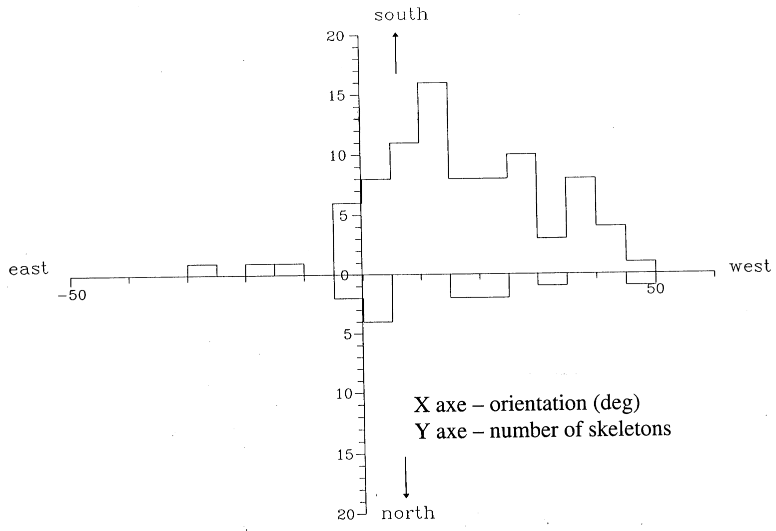

Figure 2: Orientation of female skeletons at Mokrin nekropolis

Table 2: Female skeletons that differ from burial ritual oriented toward north

No. of grave	Morphological analysis of skeletons	Body orientation	Skeletal orientation	Face orientation
62	female	left	north	east
63	female	right	north	west
64	female	right	north	west
94	female	left	north	east
95	female	left	north	east
127	female	right	north	-
132	female	right	north	west
159	female	right	north	west
266	female	right	north	west
272	female	left	south	west
299	female	right	north	east

Only one skeleton is *correctly orientated* (272) and *incorrectly placed* so that it faces west. Girić mentions other female skeletons (138, 141, 153 and 270) that faced west (1971:197). However, except skeleton 138 whose orientation could not be precisely determined from the illustration of the grave, sketchings of other graves mentioned were not published. Skeletons 62, 94 and 95 are *incorrectly orientated, but correctly placed* in the grave and they face east. These skeletons are actually buried as if they were male. Skeletons 63, 64, 127, 132, 159, 266 and 299 are *incorrectly orientated* (head toward north) and *incorrectly placed* in a grave (on the right hand side) so they face west, except skeletons 127 (skull dislocated) and 299 (facing east). There are indications that the head of skeleton 299 was turned in an unnatural position to face east by use of force *which is a unique occurrence in the Mokrin necropolis.*

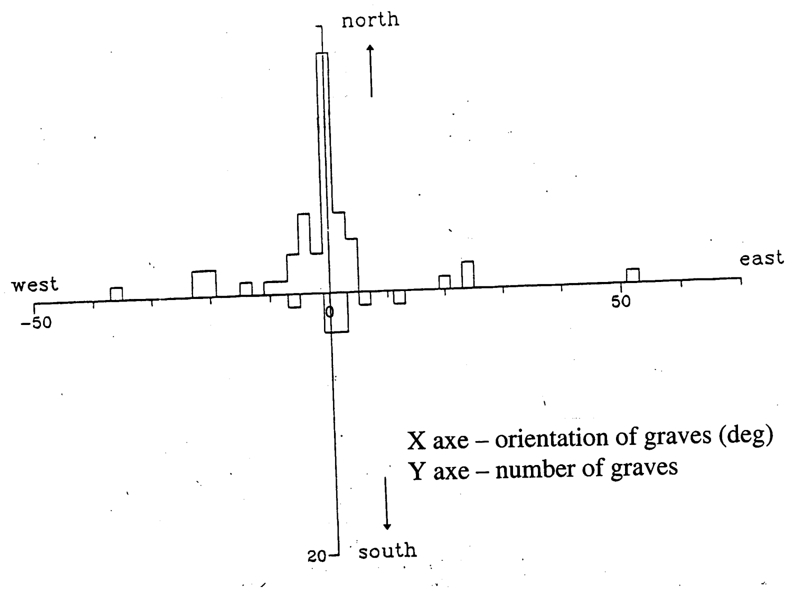

Figure 3: Orientation of male graves at Mokrin nekropolis

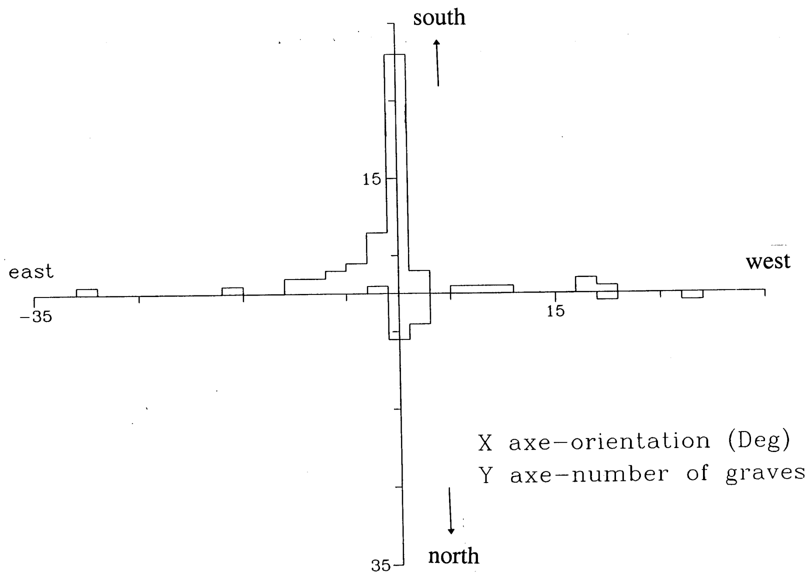

Figure 4: Orientation of female graves at Mokrin nekropolis

Relations between correctly orientated and placed female skeletons and those female skeletons that differ from this rule have been analyzed. Same criteria as with male skeletons have been used. *No other differences in burial rite were detected in this case either.*

Grave orientation

The orientation angle of a grave was measured between one longer side of the grave and geographical north clockwise (toward the east). Orientation of 154 graves was measured. Graves were divided into male (67) and female (87) ones based on the orientation of the skeletons they contained. The direction of graves was determined so that the precision of orientating graves could be compared with the precision of orientating skeletons in them.

Orientation of male and female graves is presented in histograms (Figures 3 and 4). Angular distribution of grave orientation shows two sharp peaks on the azimuth of 180° for female and 0° (i.e. 360°) for male grave pits, which corresponds with the custom of burying male deceased in the north–south direction (head to north) and female in the south–north direction (head to south). When compared with the width of the angular distribution of skeleton orientation from histograms 1 and 2, it is clearly visible that grave pits were much more precisely orientated.

To determine the accuracy of skeleton and grave orientation, we have disregarded the difference in the direction male and female skeletons were orientated in and incorporated the peaks of their histograms (see Figures 5 and 6). The angular distribution was then approximated with a Gaussian. The halfwidth of the Gaussian was taken as unit of the deviation. Results acquired this way show that the precision of orienting graves is $\pm 7.5°$ off the north–south axis, while in the case of skeletons the deviation is $\pm 25.9°$, which means that the width of the distribution of skeleton orientation is 3.4 times bigger than in the case of graves. Deviation of only 7.5° to the north–south axis indicates that greater attention was paid to orientating grave pits (Vince 1996:201). On the other hand, deviation of skeleton orientation of 25.9° testifies that prehistoric inhabitants of Mokrin did not bother with precise orientation of skeletons once within a grave. It seems that by orientating grave pits demands of the burial custom were satisfied.

Orientation of the necropolis and patterns in grave distribution

The Mokrin necropolis was orientated in two directions: north–northwest and south–southeast. Gy. Farkas and P. Lipták have singled out few parallel rows in the north–south direction. Within these rows certain regularity was detected: younger male individuals were buried in the northern part, younger female individuals in the southern part, while older individuals were buried in-between. No analysis has been carried out in order to determine if there were any genetic links among the deceased buried in the same row (Farkas and Lipták 1971:262).

Gy. Farkas and P. Lipták have also observed several groups of 6 to 8 graves concentrated on one elliptic area. Analysis of blood types that was conducted on them revealed that skeletons within one group were related (Farkas and Lipták 1971:262).

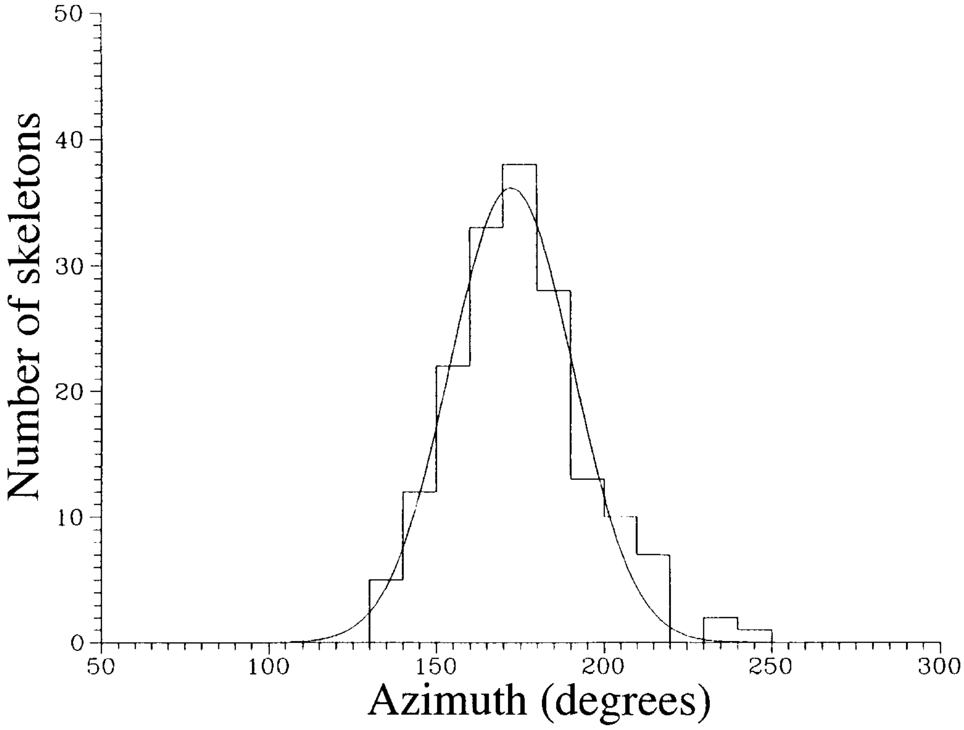

Figure 5: Orientation of skeletons in the cemetery at Mokrin deduced to 180°

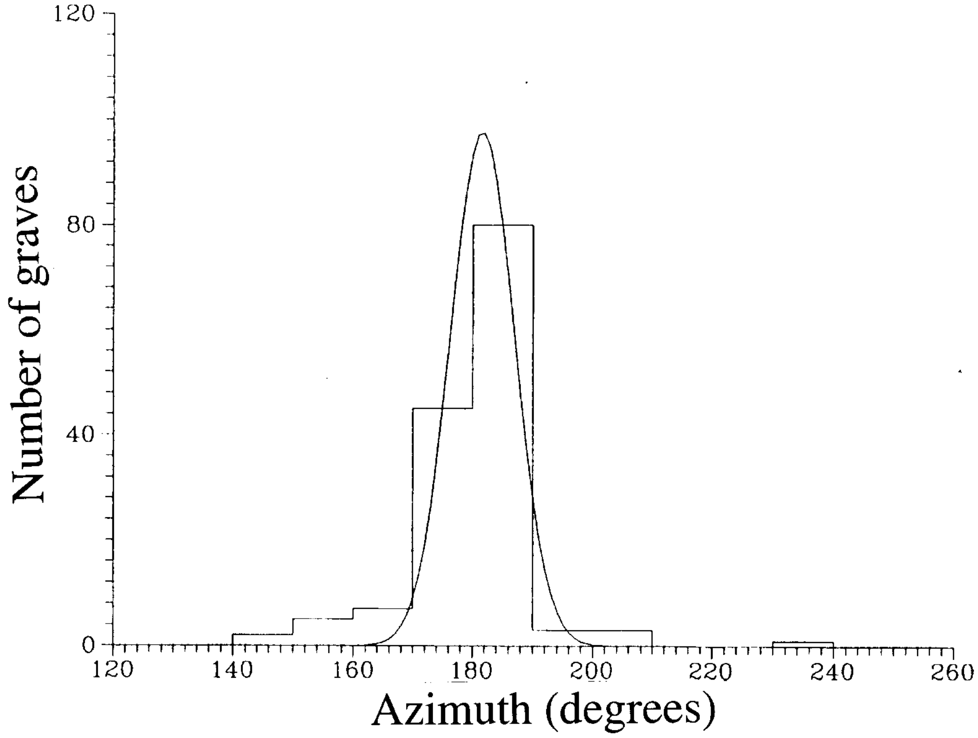

Figure 6: Orientation of graves in the cemetery at Mokrin deduced to 180°

Conclusion

The consistent orientation of grave pits in north-south direction and vice versa could be explained in the same way as the east-west orientation — by the basic movement of the Sun: the north is cold, the south is sunny/warm. But in case of Mokrin, another, equally persistent, orientation exists — face orientation toward east/west depending on the sex of the deceased.

Comprehensive explanation of such ritual can only be speculated for the present: men face east, in the direction of approaching Sun, with the free right hand, the one that governs arms and that has always symbolized warrior's strength. Women also face the Sun, the origin of all life; women have a free left hand, the one on which a newborn lays. Neolithic Great Goddesses of Life are most commonly presented in that position.

All stated indicates the existence of complex religious beliefs in the Early Bronze Age of Danube and Tisa valley manifested in the particular burial ritual obligatory for all members of the population

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Table 3: Male skeletons: age, body position, angle of skeleton and grave orientation and face orientation.

Grave No.	Age	Body position	Skeletal orientation angle	Grave orientation angle	Face orientation
1	inf1	left	180	-	-
6	inf2	left	0	357	east
10	sen	right	356	24	west
12	ad	-	-	3	-
13	inf1	-	-	4	-
14	ad	left	358	-	east
16	juv	left	2	0	east
23	inf2	left	4	4	east
24	ad	left	14	356	east
26	ad	left	0	0	east
36	inf2	left	353	340	east
38	ad - sen	left	8	0	east
40	ad	left	39	-	east
41	inf2	left	-	0	-
42	ad	-	-	180	-
49	-	-	-	0	-
57	ad	left	1	21	-
74	ad	left	355	-	east
79	mat - sen	right	177	180	east
83	ad	left	25	3	-
85	ad	left	357	0	-
91	sen	left	29	0	east
92	sen - mat	left	16	2	east
110	ad	left	31	-	east
112	inf2	left	0	-	east
115	inf1	left	340	2	east
118	mat	left	0	356	east
122b	inf2	left	22	185	east
122S	ad	right	190	185	east
123	inf1	left	30	-	east
125	mat	left	38	24	east
126	mat	left	62	53	east
129	mat	left	32	4	east
134	inf1	-	-	0	-
139	inf1	left	25	0	east
145	ad	left	354	358	east
147	ad	right	175	167	east
148	inf1	left	11	351	east
149	sen	left	351	353	east
150	sen	left	356	350	-
157	-	-	-	2	-
158	mat	left	344	338	east
164	inf1	-	-	346	east
167	ad - mat	right	337	0	west

Table 3: continued.

Grave No.	Age	Body position	Skeletal orientation angle	Grave orientation angle	Face orientation
168	mat	left	22	-	east
169	inf2	left	8	-	east
171	ad	left	6	-	east
173	mat	left	358	0	east
177	sen	left	348	-	east
185	mat	left	6	0	east
187	ad	scattered bones	-	0	-
189	mat	left	54	-	east
198	sen - mat	left	35	358	east
202	inf2	left	155	-	west
208	mat	left	203	-	west
210	sen	right	175	-	east
211	mat - sen	left	357	357	east
212	inf2	left	-	355	east
218	ad	left	17	-	east
226	mat	left	180	177	west
230	mat - sen	left	17	354	east
232	ad	left	22	0	east
234	ad	left	17	0	east
238	inf2	left	-	5	east
239	inf2	left	345	0	east
240	mat	left	5	357	east
241	ad	left	330	340	east
242	ad	-	-	177	-
243	ad	left	32	354	east
244	ad	-	-	173	-
250	mat	left	353	324	east
259	ad	left	24	358	east
262	inf1	left	-	3	-
263	ad	left	17	357	east
264	mat	left	9	-	east
265	inf2	left	17	0	east
274	ad	-	-	339	-
277	ad	left	12	-	east
280	ad	left	21	358	east
281	sen	right	160	-	east
282	juv	left	24	-	-
286	ad(?)	-	-	355	-
290	inf2	left	10	0	east
291	ad	left	0	-	east
292	inf1	left	9	0	east
295	juv	left	357	0	east
296	ad	left	0	0	east
301	ad	left	9	354	east

Table 4: Female skeletons: age, body position, angle of skeleton and grave orientation and face orientation.

Grave No.	Age	Body position	Skeletal orientation angle	Grave orientation angle	Face orientation
2	inf1	right	-	180°	east
3	mat	right	152°	357°	east
5	inf1	right	165°	357°	east
7	ad	right	162°	180°	east
8	sen	-	-	0°	-
9	ad	right	148°	-	east
11	ad	right	-	198°	east
15	ad - m	at right	152°	-	east
19	ad	right	-	177°	east
20	mat	right	169°	180°	east
22	inf1	right	164°	180°	east
25	inf1	right	167°	-	east
39	ad	right	140°	-	east
47	inf1	-	-	181°	-
48	inf1	-	-	180°	-
52	ad	right	0°	0°	-
53	ad	right	184°	176°	east
55	inf2	right	137°	179°	east
56	juv	right	173°	165°	east
61	ad	right	177°	-	-
62	inf2	left	0°	-	east
63	ad	right	325°	-	west
64	ad	right	358°	0°	west
69	ad	right	176°	180°	east
73	ad	right	132°	145°	east
76	sen	right	156°	-	east
77	ad	right	152°	360°	east
78	inf1	right	165°	-	east
80	ad	right	168°	180°	east
82	ad	right	171°	180°	east
84	sen	right	158°	180°	east
89	mat	right	150°	180°	east
90	-	right	175°	180°	east
94	inf1	left	358°	340°	-
95	inf1	left	-	332°	east
96	inf2	right	165°	179°	east
97	ad	right	177°	180°	east
98	ad	right	137°	175°	east

Table 4: continued.

Grave No.	Age	Body position	Skeletal orientation angle	Grave orientation angle	Face orientation
100	ad	right	167°	175°	east
101	ad	right	172°	178°	east
102	ad	right	160°	180°	east
104	ad	right	167°	173°	east
108	ad	right	179°	180°	east
109	ad	right	161°	173°	east
113	ad	right	148°	-	east
117	ad	right	196°	198°	east
119	mat	right	145°	145°	east
124	mat	right	208°	180°	-
127	ad	right	2°	-	-
128	inf2	right	167°	178°	east
132	ad	right	342°	357°	west
133	ad	right	156°	180°	east
135	inf2	right	174°	180°	east
136	ad	right	151°	159°	east
137	ad	right	178°	178°	east
140	ad	right	137°	177°	east
144	ad	right	180°	170°	east
151	ad	right	168°	-	east
154	mat	left	140°	180°	east
155	mat	right	142°	-	east
159	ad	right	340°	358°	west
161	inf 2	right	157°	168°	east
165	mat	right	157°	-	east
170	mat	right	175°	-	east
172	ad	right	175°	-	east
174	mat	right	172°	-	east
179	mat	right	158°	-	east
180	mat	right	191°	-	east
181	ad	right	166°	180°	east
182	ad	right	166°	182°	east
186	inf2	-	-	180°	-
191	inf2	right	165°	-	east
194	inf2	right	158°	-	east
200	ad	right	-	179°	east
201	ad	right	163°	-	-
205	sen	right	165°	180°	east
206	sen	right	140°	-	east
209	ad	right	172°	-	east
215	inf2	right	-	177°	-

Table 4: continued.

Grave No.	Age	Body position	Skeletal orientation angle	Grave orientation angle	Face orientation
221	sen	right	150°	-	east
222	mat	right	140°	-	east
223	inf2	right	167°	-	east
227	mat	right	171°	180°	east
228	mat	right	172°	180°	east
229	ad	right	163°	178°	east
231	ad	right	150°	190°	east
235	ad	right	143°	180°	east
237	ad	right	160°	-	east
245	ad	right	142°	188°	east
246	ad	right	157°	183°	east
247	inf2	right	151°	-	east
248	mat	right	171°	175°	east
252	mat	right	-	180°	east
256	ad	right	-	180°	-
257/A	ad	right	152°	-	east
261	ad	right	180°	183°	east
266	ad	right	339°	0°	west
267	inf1	right	178°	180°	east
268	inf2	right	-	180°	-
269	sen	right	170°	177°	east
271	mat	right	153°	180°	-
272	ad - m	at left	160°	151°	west
279	ad	right	168°	180°	east
283	ad	right	138°	-	east
287	ad	right	180°	178°	east
288	sen	right	180°	180°	east
293	ad	right	181°	-	east
297	sen	right	180°	2°	east
299	ad	right	50°	-	east
300	ad	right	168°	-	east
302	ad	right	170°	187°	east
305	juv	right	141°	-	east