

## INTERPRETATION OF 10TH-11TH CENTURY POPULATIONS IN THE NORTHERN PART OF THE REGION EAST OF THE TISZA ON THE BASIS OF REPRESENTATIVE SAMPLES

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### Abstract

An attempt was made to interpret the break in the population history of North-Eastern Hungary at the turn of the 10th and 11th centuries (the time of conversion to Christianity) through estimation of the diversity of three representative chronopopulations. This change in population history is indicated by data on representative cemeteries (Ibrány-Esbó Halom, Sárrétudvari-Hízóföld, Szabolcs-Petőfi utca) and interpopulation and intrapopulation aspects. The diversity of the 11th century population surpasses that of the 10th century population (independently of their geographic locations).

*Key words:* Ancient Hungarians, 10th-11th centuries, craniological diversity.

### Introduction

The only previous way to reconstruct the 10th-11th century population history of the North-Eastern part of the Carpathian Basin was on the basis of cemeteries that were only partly known (ÉRY, 1978, 1994; SZATHMÁRY 1996, and in press). Recent findings indicate that a very significant change occurred in the North-Eastern region at the beginning of the 11th century, as concerns the structure of the population; the extent of this change can be compared only to the genetic impulse induced by the conquering Hungarians (SZATHMÁRY, 1996, in press; SZÜCS et al., 1997).

The aim of this paper is to attempt to interpret this change in population history within the transitional period between the Pagan period and the Early Christian period on the basis of skull finds from three representative cemeteries.

## Material and method

The chronological distribution of adult skeleton finds from the cemeteries studied is favourable since we could monitor both intrapopulation and interpopulation relations during the 10th and 11th centuries. Our database was as follows:

Group 1 = IbE10 / Ibrány-Esbó halom (10th century part): 16 males and 16 females (ISTVÁNOVITS, 1996a, 1996b; SZATHMÁRY et al., 1996) (Tables 5 and 6)

Group 2 = SaH 10 / Sárrétudvari-Hizóföld (10th century): 51 males and 36 females (NEPPER, 1996; OLÁH, 1990, 1991) (Tables 7 and 8)

Group 3 = IbE11 / Ibrány-Esbó halom (11th century part): 23 males and 22 females (ISTVÁNOVITS, 1996a, 1996b; SZATHMÁRY et al., 1996) (Tables 5 and 6)

Group 4 = SzP11 Szabolcs-Petőfi utca (11th century part): 22 males and 12 females (KOVÁCS, 1994; PAP, 1980-81) (Tables 9 and 10).

The 11 analysed dimensions on the restored skulls had the following Martin nos. (MARTIN, 1928): 1, 5, 8, 9, 17, 20, 48, 51, 52, 54 and 55. The missing values (maximum 8 for individuals, maximum 30% for variables) were reconstructed by the DEAR (1959) method. The calculated data comprised 19% of the whole database. The reconstruction of the different values for these two centuries was based on the full database of the North-Eastern region. This relates to 139 males and 91 females in the 10th century (cf. SZÜCS et al., 1997) and to 83 males and 54 females in the 11th century (cf. SZATHMÁRY et al., 1996). The investigations on the total ranges of data were made by discriminant (dsc) analysis.

## Results

Of the three dsc functions, the first two were significant in both sexes (Tables 1 and 2). Therefore, it is worth surveying the positions of the centroids in the first two dimensions (Fig. 1).

The result clearly demonstrates that the population at Ibrány-Esbó halom was not homogeneous. Its 10th century population was nearly as far from the 10th century sample at Sárrétudvari (geographically distant from it) as from its own 11th century population. Previous findings (SZATHMÁRY et al., 1996; SZÜCS et al., 1997) suggested that the population at Ibrány from the Age of the Hungarian Conquest had completely changed by the 11th century. At present, we are still unable to define the ethnic group which followed the 10th century one. We only suspect that the influence of the population movements which affected the North-Eastern region at the end of the 10th century and at the beginning of the 11th century did not extend to Transdanubia (SZÜCS et al., 1997). The extreme position of the 11th century population at Szabolcs-Petőfi utca for both sexes is worthy of mention. Thus, the two 11th century samples have significantly different anatomical characters. These significant differences may be due to the populations in the Early Arpadian having different roots and it is most probable that they cannot be derived from local origins.

Table 1. Canonical discriminant functions - Males.

Fcn	Eigenvalue	Pct of variance	Cum pct	Canonical correlation	After Fcn	WILKS' lambda	Chi-square	df	Sig
					0	0.2920	127.41	33	0.0000
1*	0.8665	52.88	52.88	0.6814	1	0.5450	62.82	20	0.0000
2*	0.6796	41.48	94.36	0.6361	2	0.9154	9.15	9	0.4239
3*	0.0924	5.64	100.00	0.2908					

\* Denotes the 3 canonical discriminant functions remaining in the analysis.

Table 2. Canonical discriminant functions - Females.

Fcn	Eigenvalue	Pct of variance	Cum pct	Canonical correlation	After Fcn	WILKS' lambda	Chi-square	df	Sig
					0	0.2970	94.07	33	0.0000
1*	1.1482	69.47	69.47	0.7311	1	0.6382	34.81	20	0.0211
2*	0.2878	17.41	86.88	0.4728	2	0.8218	15.21	9	0.0854
3*	0.2168	13.12	100.00	0.4221					

\* Denotes the 3 canonical discriminant functions remaining in the analysis.

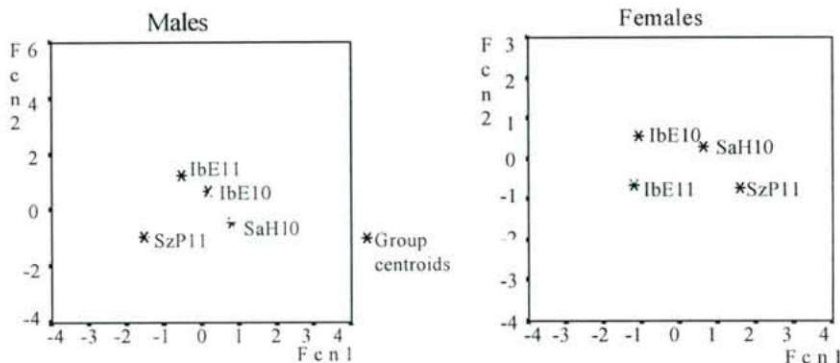


Fig. 1. Canonical discriminant functions

The classification results (Tables 3 and 4) yield the surprising result that the 10th century population at Ibrány was heterogeneous in both sexes, as presumed previously for the Upper Tisza region on the basis of fragmentary samples (SZATHMÁRY, 1996; SZATHMÁRY et al., 1996). At the same time, in the 11th century in the North-Eastern region, the characteristics of an unbalanced population dynamics of mosaic character can be reconstructed. For example, the females from Ibrány are more heterogeneous than the males, while in Szabolcs the opposite trend may be observed.

Table 3. Classification results - Males.

Actual group	No. of cases	Predicted group membership as a percentage			
		1	2	3	4
1 Ibrány-Esbó halom 10th century	16	50.0	18.8	18.8	12.5
2 Sárrétudvari-Hizóföld 10th century	51	13.7	74.5	3.9	7.8
3 Ibrány-Esbó halom 11th century	23	17.4	8.7	73.9	0.0
4 Szabolcs-Petőfi utca 11th century	22	9.1	0.0	13.6	77.3

Percentage of "grouped" cases correctly classified: 71.4%

Table 4. Classification results - Females.

Actual group	No. of cases	Predicted group membership as a percentage			
		1	2	3	4
1 Ibrány-Esbó halom 10th century	16	56.3	25.0	12.5	6.3
2 Sárrétudvari-Hizóföld 10th century	36	2.8	83.8	2.8	11.1
3 Ibrány-Esbó halom 11th century	22	27.3	0.0	68.2	4.5
4 Szabolcs-Petőfi utca 11th century	12	8.3	0.0	0.0	91.7

Percentage of "grouped" cases correctly classified: 75.6%

When only the Ibrány sample is investigated by dsc analysis, in the 10th century population 94% of the males, and in the 11th century population 83% of the males are characteristic of their own periods. The survivor population accounts for 12% among males and 24% among females.

### Conclusions

Certain craniological arguments may corroborate the earlier hypothesis that the 10th century population characteristic of the Age of the Hungarian Conquest in NE Hungary might have changed significantly by the 11th century.

Table 5. Ibrány-Esbő halom - Basic data on adult males.

Grave no.	Measurements (MARTIN, 1928)													Century
	M1	M5	M8	M9	M17	M20	M45	M48	M51	M52	M54	M55	M66	
154	191		128	91		117		71	39	35	25	52	81	10
164	181		147	91		112			32	31	19		103	10
170	175			99		114		68	39	34	28	49		10
176	183	101	156	114	129	114		70	41	36	21	50		10
189	186		138	96		112		64			24	47		10
190			152	109	144	119					27			10
203	184		145	103		119							91	10
215	189	106	152	102	133		129	66	40	32	25	52	105	10
236	184	109	146	97	132	105		74	43	36	26	55	100	10
249	185		126	94	114			66	37	34	27	50	99	10
250	190		131	96		104			44					10
256	194		128	91		111	123	73	43	34	24	54	86	10
258	195		134	94		121			42	37	27			10
260	183	111	142	97	136	110		73	40	30	28	51	110	10
262	185	106	138	93	132	113			36	26	24	48	104	10
267						121			39		26	49		10
14	187		134	95		106		72	35	31	22	52		11
17	179	115	156	105	141			76	43	34	25	47		11
29	182	97	144	95	124	105	121	69	40	32	23	53	89	11
37	193	101	144	96	130	119		68	43	30		55		11
39	162		164	101		116			43	34	24			11
44	164		150	93		111	131	68	38	32	23	48	102	11
53	175	96	152	101	141	122	139	73	40	32	22	53	96	11
64	189	105	140	109	132	117		68	38	29	26	49		11
69	189	111	147	110	148	120					24		94	11
71	192	101	144	100	131	108					28		97	11
75	195	103	148	102	133	111			36	34	27			11
81	187	96	143	101	130	106	137	72	40	33	23	51		11
90	196		137	97		118					28			11
93	172	98	140	91	126	111		68	38	31	24	49	99	11
94			141		147	124			40	33			100	11
101	190		138	94		116		73	40	38	26	56	110	11
107	183	98	140	100	122	106					28		102	11
111	184	98	135	97	133	110	126	65	32	38	26	46	98	11
112	187		142	99		127			40	31				11
119	194		134	97		118		71	37	34	26	49		11
130	178		132	92		113		68	39	31	28	46		11
135	180		155	94		118		70	39	29	28	51		11
136	182		127	90		102		68	39	32	22	53		11



Table 7. Sárrétudvari - Hizóföld - Basic data on adult males.

Grave no.	Measurements (MARTIN, 1928)											Century		
	M1	M5	M8	M9	M17	M20	M45	M48	M51	M52	M54		M55	M66
3	179	100	149	93	142	118	145		41	35	23		107	10
9	184		125			109							91	10
11	169			96				67	39	31	23	52		10
14	186	100	142	96	137					36	23			10
20			138	94		118					26		104	10
21				99				78	45	35	27		94	10
29				98				76		36		57	102	10
34	173	95	158	96	133	122	138	63	40	28	23	47	95	10
37	181	110		102	132	122		65	43	33	27	49	93	10
41				102				67	42	35	25			10
45			128	92		115							93	10
48				100						31	26		104	10
51	186	109	142	99	148	120		61	44	33	25	51	102	10
51	186	109	142	99	148	120		61	44	33	25	51	102	10
62		101		96	137	114		76				52	101	10
72				91				69			24	52	94	10
80	204		155	101		127		66	42	31		51	100	10
90	187		131	95		116		72	42	36	24	59		10
100	179	104	141	101	134	110							110	10
105	179	104	140	96	137	111					27		113	10
106				102				63		32	27	51	101	10
108	165	95	151	105	134	114	136	67	41	31	26	52	103	10
112	178		156	101		116	156	72	44	33	29	57		10
123	207		140	98				72	45	33		58		10
124	195	112	145	104	142	120	133	69	43	31	26	56		10
128				103				67			24	52		10
145			130	92	129	110							87	10
146	176	103	157	105	142	123	144	67	41	32	26	52	102	10
149	190		138	94		112		68	44	33		52	110	10
160	184	99	144	91	126	110		65			24	49	100	10
169	187	104	136	104	138	110	131	71	41	31	30	55	105	10
171			153	100		120	142	73	42		28	55	104	10
179	190	110	139	87	137	114							108	10
181	196	97	139	99	132	116		72	43	37	23	54	100	10
182	186	100	139	99	135	117		68	41	32		49		10
183	197	111	140	104	141	119	137	67	46	35	29	50	114	10
185	194			89		120			40				106	10
186	193	98	151	101	137	123	136	70	41	33	24	53		10
188	184		147			116	134				25		110	10
201	188		144	95		116		68			24	53	107	10
202	175	99	141	102	131	116		63	41	32	30		94	10
214	181		137	94	141	117		69	40	32	24	55	94	10
218	190		145					65			25	55		10
228	191		134	99		117					24		100	10
231	169		146	102		112		65	45	32	27	52	106	10
232	183	100	143	103	137	113		75	44	39			105	10
237	184		145	101		113							103	10
242			145			120		63					96	10
243			152	102		116		62			22	45		10
244	183			94		107							94	10
245	190		149	107	137	117								10
247	180	99		99	128	111	134	65			27	51	102	10
252	184			96		116		68	44	37	25	54	102	10
257			147	98		116							101	10
258				108		118		73	44	35	28	55	95	10
259	182	105	141	98	134	114	135	67	43	35	26	54	103	10

Table 8. Sárretudvari - Hizóföld - Basic data on adult females.

Grave no.	Measurements (MARTIN, 1928)													Century
	M1	M5	M8	M9	M17	M20	M45	M48	M51	M52	M54	M55	M66	
10	193		130			105							88	10
12	174	100									26		96	10
13	185	105	134		137	115								10
19	164	93	147	95	129	111	129	65	40	35	24	50		10
22	179			94		112			42	34			104	10
23	185	97	137	87	121	102							93	10
28	174	98	138	90	128	103	119	63	41	31	23		97	10
32				87				63		34		42		10
43	184	98	135	97	130	109					25		99	10
53	181		138	94		107		70	43	35			92	10
97				94				69	42	38	25	54		10
99	171	102	145		133	117								10
101	187	107	132	93	136			63	40	36		51	99	10
107				97				76	45	35	26	55	91	10
118		89		98	127			66	40	34		52	95	10
119			132	98	130	105							92	10
131	174	88	138	96	128	112							101	10
134				93		107	126	62	38	30	24	47	98	10
148	179		132	96		115							88	10
151	185		140	94		113	125	70	41	34	27	54		10
159				92	135	112							100	10
167	177	104		98	143	119		64	42	32		48	93	10
177	181	95	135		130	110							90	10
189	173	93	148	94	132	109	129	63	46	35		46	101	10
191			135	97					42	32			103	10
192	176			92							24		92	10
194	178	99	142	99	136	120		65	41		24	48	99	10
204	177	96	143	93	127	107							95	10
205	193	107	131	101	131	112	126	64	43	36		48	97	10
207	168			93		114		63	41	35	26	47		10
208			140	96				66				49		10
225	165	92	144	93	127	107		60	40	35	23	46	87	10
229	189		139	100		115							91	10
233				92		110		63	43	31	24	49		10
239	184		134	103		114							97	10
240	180			99		116							82	10
249	177		139	95		107							88	10
256	186		138	98									94	10
261	186		136	95	135	113	128	66				49	94	10
263	186	104	144	106	125	108								10
265	187	101	135	92	138	121		64	43	32	23	51	99	10
268	187		141	101		113			41	32				10

Table 9. Szabolcs - Petőfi utca - Basic data on adult males.

Grave no.	Measurements (MARTIN, 1928)													Century
	M1	M5	M8	M9	M17	M20	M45	M48	M51	M52	M54	M55	M66	
74	168		130	98									105	11
90	181	103	137		140	113	135	74	44	30	26	52	110	11
91	182	103	145	96	127	113	139		44	38	24	53	97	11
93	170	98	148	92	132	117	140	73	45	33	26	54	97	11
95	187	109	140	96	146	119					19			11
116	184	106	133	97	133	108	134	72	45	32	24	48	103	11
140	185	100	140	96	125	111	124	70	42	32	26	49	105	11
141	185	100		94	132			63	45	33	24	46		11
151	189	100	134	102	131	114	128	68	43	32	26	51	96	11
158	198	108	139	99	138									11
164	171	95	146	97	131	113		74	44	33	20	54	91	11
191	184			99				76	48	34	31	52		11
198	103	108	137	95	136	113	133	68	43	32	23	50		11
280								70	42	31	23	50		11
285	190		131	92		117								11
300	193		139	96				72	45	32	28	52		11
320	186	105	137	95	138	112					26			11
330				91				64	42	34	24	48		11
337	178		140	96		113								11
343	180		150	98		117		75	43	32	26	54	116	11
349	176	99	141	97	131	113	135	67	43	31	24	49		11
352	178	90	141	94	131	114		68	45	32	24	52		11

Table 10. Szabolcs - Petőfi utca - Basic data on adult females

Grave no.	Measurements (MARTIN, 1928)													Century
	M1	M5	M8	M9	M17	M20	M45	M48	M51	M52	M54	M55	M66	
104	175		136	91		109		69	44	33			96	11
134	185	98	141	95	129	112		64	45	33	27	47		11
147	181	100	136	94	127	108		58	42	31	24	46		11
155	182	98	134	92	128			71	42	32	24	51		11
178	170		135	89			127	66	41	32	24	51	92	11
195		92		85	116			58	40	32	24	42		11
213			137	95				67	42	31	27	50		11
262			142	94	134	113							99	11
298	172	99	134	91	128	108	125	71	42	35	22	49	97	11
334				91				68	42	33				11
354	183	98	135	100	129	113		60	41	30	30	48		11
362				91				63	41	31	24	49		11

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