THE ANTHROPOLOGICAL ASSESSMENT OF THE LATE ROMAN CEMETERY AT SOMOGYSZIL-DÖGKÚTI DŰLŐ

SÁNDOR ÉVINGER – ZSOLT BERNERT

Department of Anthropology
Hungarian Natural History Museum
2–6 Ludovika tér, H–1083 Budapest, Hungary
evinger.sandor@nhmus.hu
bernert.zsolt@nhmus.hu

Abstract: The results of a general anthropological examination of 140 individuals from a late Roman period cemetery at Somogyszil-Döggút site are presented in this paper. The population had a more or less balanced sex ratio, lived a fundamentally peaceful life suggested by the low frequency of bone injuries, and according to their morphoscopic traits, they all belonged to the Caucasoid group. Based on the biological distances calculated from selected linear measurements of male crania, the population of Somogyszil-Döggút proved to be quite similar to several other late Roman period cemeteries in Transdanubia, as well as to some local Avar period series. This raises the possibility of a significant local continuity between the late Roman and late Avar period on this territory, however other potential explanations cannot be ruled out. Some anthropological characteristics of the human skeletal material unearthed from graves oriented differently than the cemetery's norm suggest the presence of immigrants in the community. Their biological background cannot be traced from the present data, however a few skeletal evidence proposes the probability of a Sarmatian origin.

Keywords: Somogyszil, late Roman period, anthropology, biological distance

INTRODUCTION

The first finds of a late Roman period cemetery at Somogyszil-Döggút was found in 1964, and until the end of 1968 altogether 148 graves had been excavated by the archaeologist Balázs Draveczky.¹ A full archaeological publication of the cemetery was given first by Alice Sz. Burger² with some basic anthropological information about the human skeletal remains provided by Tibor Tóth. However, recently both the archaeological and anthropological material was put to a re-assessment.³ In this paper a more detailed version of the results of the anthropological examination is presented.

MATERIAL AND METHODS

The human skeletal material of Somogyszil-Döggúti dűlő site is housed in the Department of Anthropology of the Hungarian Natural History Museum under the inventory numbers 68.126.1. – 68.126.124. and 68.150.1. – 68.150.17. The general preservation of the bones are quite mediocre on average with many of them being strongly incomplete and/or badly preserved.

For scoring morphological sex, altogether 21 anatomical characteristics indicating sexual dimorphism were used.⁴

¹ DRAVECKY 1965; DRAVECKY 1966; DRAVECKY 1967.

² BURGER 1979.

³ HORVÁTH *et al.* 2018.

⁴ ÉRY *et al.* 1963; ÉRY 1992.

The biological age estimation of children was based on tooth eruption⁵ and on the maximum length of long-bones.⁶ In the case of juveniles, the union of certain ossification centres was checked.⁷ The biological age of adults was estimated on the basis of the surface alterations of the pubic symphysis,⁸ the ossification of cranial sutures,⁹ the alterations of the sternal rib ends,¹⁰ the wear of permanent dentition¹¹ and on the root transparency of teeth.¹²

Cranial and longbone measurements and indices were taken according to the work of R. Martin and K. Saller.¹³ Cranial indices were categorized into classes based on the recommendations of V. P. Alekseyev and G. F. Debetz.¹⁴ Cranial capacity was calculated with the method of A. Lee and K. Pearson.¹⁵ Using the mean standard deviations of cranial measurements and indices given by V. P. Alekseyev and G. F. Debetz sigma ratios (S.R.)¹⁶ were calculated which offer basic information about the relative measure of variance of these traits. This way, they tell whether the examined population was more heterogeneous or homogeneous than a theoretical natural population based on their selected measurements and indices.

Stature was calculated using the formula proposed by T. Sjøvold¹⁷ that controls for all geographic areas and for both sexes using the femur. If the femur was not measurable, the tibia was used instead.

Mortality tables for the demographic analysis were created based on the works of D. H. Ubelaker¹⁸ and K. Éry,¹⁹ using the Excel software package created by Zs. Bernert.²⁰ For the „lack of newborns” (a common problem with excavated ancient populations) no correction was applied.

A systematic pathological examination was not performed on the skeletal material; only the observed traumatic lesions were described based on D. J. Ortner²¹ and V. L. Wedel and A. Galloway.²²

The estimation of the biological distance between the late Roman period population of Somogyszil-Döggúti dűlő and other ancient populations was performed using the method elaborated by Penrose,²³ based on the means of ten selected measurements (M1, M8, M9, M17, M45, M48, M51, M52, M54, M55) of the male skulls. For scale adjustment, the raw data were transformed with the standardised mean deviations of A. Thoma.²⁴ According to the recommendation of I. Schwidetzky,²⁵ only those series should be drawn into the PENROSE biodistance calculation where the mean of every selected measurement is made up of at least seven data. We followed this recommendation in the case of the comparative materials, thus from the territory of the Carpathian Basin and from between the second to eighth centuries only those series were selected that conform to this criterion. This resulted in a total of 55 series for comparison. However, the Somogyszil-Döggúti dűlő male cranial material itself fails to satisfy the above-mentioned criterion, as one of the selected cranial measurements (M17) is made up of only six individuals. Nonetheless, we chose to perform the biodistance calculations in order to determine how the Somogyszil-Döggúti population fits into the “framework” of other populations representing the territory and time interval chosen for the analysis. (Naturally, using an insufficient sample size may weaken the conclusions drawn from the analysis.) The relations of the Somogyszil-Döggúti dűlő (male) population and its close analogies (below the 1% and 2% error bands) were visualized with the help of a dendrogram that was created with the UPGMA (Unweighted Pair Group Method with Arithmetic Mean) hierarchical clustering method.²⁶

⁵ SCHOUR–MASSLER 1941; UBELAKER 1989.

⁶ STLOUKAL–HANÁKOVA 1978.

⁷ SCHINZ *et al.* 1952; FEREMBACH *et al.* 1979.

⁸ TODD 1920.

⁹ NEMESKÉRI *et al.* 1960; MEINDL–LOVEJOY 1985.

¹⁰ ISCAN *et al.* 1984.

¹¹ HUSZÁR–SCHRANZ 1952; PERIZONIUS *cit.* ÉRY 1992.

¹² LAMENDIN *et al.* 1992.

¹³ MARTIN–SALLER 1957.

¹⁴ ALEKSEYEV–DEBETZ 1964.

¹⁵ LEE–PEARSON, *cit.* ÉRY 1992.

¹⁶ ALEKSEYEV–DEBETZ 1964.

¹⁷ SJØVOLD 1990.

¹⁸ UBELAKER 1989.

¹⁹ ÉRY 1992.

²⁰ BERNERT 2005.

²¹ ORTNER 2003.

²² WEDEL–GALLOWAY 2014.

²³ PENROSE 1952.

²⁴ THOMA 1978.

²⁵ SCHWIDETZKY 1967.

²⁶ SOKAL–MITCHENER, *cit.* PODANI 1997.

RESULTS

Demographic results

The remains of 140 individuals were brought to light. The basic summary data of their sex and age distribution are presented in *Table 1*. The male/female sex ratio is more or less balanced (49 males, 56 females and 3 indeterminate individuals). The proportion of children as compared to adults is low, which can most likely be explained by the poor preservation of the anthropological material (*Table 2*). The mortality peak falls at the beginning of the *maturus* age in the case of males (40–44 years) and in the middle of the *adultus* age in the case of females

Fig. 1. The mortality curve of the Somogyszil-Döglő population

Table 1.
Sex and age distribution of the Somogyszil-Döglő population

Sex \ Age group	Males	Females	Unknown	Total
1–6			12	12
7–14			17	17
15–19	1		3	4
20–39	20	40	1	61
20–59	1	4		5
40–59	26	8		34
60–	1	2		3
Unknown		2	2	4
Total	49	56	35	140

(30–34 year; *Figure 1* and *Table 3*). This sexual difference in the mortality peak is generally observed among historical populations, and it is most likely an effect of the risks of childbearing (the possible complications of pregnancy and giving birth).

Metric and morphological characteristics of the skulls

In terms of morphological attributes (*Table 4*), the following traits are quite common in the population: the skull is ovoid in superior view, the occipital is curved, and the spina nasalis anterior is small or moderately developed. Rounded and rectangular-shaped orbits are equally frequent, and the morphology of the canine fossa is also

Table 2.
Some basic data of the human skeletal material of Somogyiszil-Döglökút

Inventory number	Grave	Sex	Age			Skull	Mandible	Postcranial skeleton
68.126.1.	1	female	20	–	25	incomplete	missing	incomplete
68.126.2.	2	female	60	–	65	incomplete	incomplete	missing
68.126.3.	3	male	50	–	60	incomplete	incomplete	incomplete
68.126.4.	4	?	3	–	5	incomplete	incomplete	incomplete
68.126.5.	5a	male	30	–	40	well preserved	well preserved	incomplete
68.126.6.	5b	male	40	–	50	incomplete	well preserved	incomplete
68.126.7.	6	?	7	–	8	incomplete	missing	incomplete
68.126.8.	7	male	50	–	60	incomplete	incomplete	incomplete
68.126.9.	8	female	40	–	75	incomplete	incomplete	missing
68.126.10.	12	male	20	–	40	missing	missing	incomplete
68.126.11.	13	?	8	–	10	missing	missing	incomplete
68.126.12.	14	male	20	–	60	incomplete	incomplete	missing
68.126.13.	15	male	30	–	40	incomplete	incomplete	incomplete
68.126.14.	16	female	25	–	35	incomplete	incomplete	incomplete
68.126.15.	17	male	40	–	55	incomplete	well preserved	well preserved
68.126.16.	18	male	25	–	30	incomplete	incomplete	incomplete
68.126.17.	19	female	60	–	70	incomplete	incomplete	incomplete
68.126.18.	20	female	25	–	35	incomplete	well preserved	incomplete
68.126.19.	21	female	30	–	40	incomplete	well preserved	incomplete
68.126.20.	23	male	30	–	40	incomplete	incomplete	incomplete
68.126.21.	24	female	30	–	35	incomplete	incomplete	incomplete
68.126.22.	25	?	15	–	18	incomplete	incomplete	incomplete
68.126.23.	26	female	20	–	23	incomplete	incomplete	incomplete
68.126.24.	27	male	25	–	30	missing	missing	well preserved
68.126.25.	29	male	40	–	45	incomplete	incomplete	incomplete
68.126.26.	30	?	15	–	18	incomplete	incomplete	incomplete
68.126.27.	31	female	25	–	30	incomplete	incomplete	incomplete
68.126.28.	32	female	20	–	40	incomplete	missing	missing
68.126.29.	33	male	50	–	55	incomplete	well preserved	incomplete
68.126.30.	34	?	9	–	11	incomplete	well preserved	incomplete
68.126.31.	35	female	55	–	60	incomplete	incomplete	incomplete
68.126.32.	36	female	25	–	35	incomplete	incomplete	incomplete
68.126.33.	37	female	20	–	25	incomplete	incomplete	incomplete
68.126.34.	38	female	35	–	40	well preserved	well preserved	well preserved
68.126.35.	39	male	40	–	45	incomplete	well preserved	incomplete
68.126.36.	40	female	20	–	25	incomplete	well preserved	incomplete
68.126.37.	41	male	50	–	60	incomplete	well preserved	incomplete
68.126.38.	42	?	6	–	7	incomplete	missing	incomplete
68.126.39.	43	female	50	–	60	incomplete	incomplete	incomplete
68.126.40.	44	female	35	–	45	incomplete	incomplete	incomplete
68.126.41.	45	male	35	–	40	incomplete	incomplete	incomplete
68.126.42.	46	male	40	–	50	incomplete	incomplete	incomplete
68.126.43.	48	male	40	–	45	incomplete	well preserved	incomplete
68.126.44.	49	male	60	–	70	incomplete	incomplete	incomplete
68.126.45.	50	male	50	–	55	incomplete	incomplete	incomplete
68.126.46.	51	male	35	–	40	incomplete	incomplete	incomplete
68.126.47.	52	female	25	–	35	incomplete	incomplete	incomplete

Table 2.
Some basic data of the human skeletal material of Somogyszil-Dölgút (cont'd)

Inventory number	Grave	Sex	Age			Skull	Mandible	Postcranial skeleton
68.126.48.	53	male	35	–	40	well preserved	incomplete	incomplete
68.126.49.	54	?	7	–	9	incomplete	incomplete	incomplete
68.126.50.	55	female	25	–	35	incomplete	incomplete	incomplete
68.126.51.	56	female	20	–	40	incomplete	missing	incomplete
68.126.52.	57	male	40	–	50	incomplete	incomplete	incomplete
68.126.53.	58	male	20	–	40	missing	missing	incomplete
68.126.54.	59	male	40	–	50	incomplete	incomplete	incomplete
68.126.55.	60	male	50	–	55	incomplete	incomplete	incomplete
68.126.56.	61	female	30	–	35	well preserved	well preserved	incomplete
68.126.57.	62	female	25	–	35	incomplete	incomplete	incomplete
68.126.58.	63	?	7	–	8	incomplete	incomplete	incomplete
68.126.59.	64–65	?	4	–	5	incomplete	incomplete	incomplete
68.126.60.	66	?	0	–	1	incomplete	incomplete	incomplete
68.126.61.	67	female	25	–	30	incomplete	incomplete	incomplete
68.126.62.	68	female	30	–	35	incomplete	incomplete	incomplete
68.126.63.	69	?	9	–	10	incomplete	incomplete	incomplete
68.126.64.	70	female	30	–	40	incomplete	incomplete	incomplete
68.126.65.	71	female	45	–	55	incomplete	incomplete	incomplete
68.126.66.	72	male	50	–	60	incomplete	incomplete	incomplete
68.126.67.	73	?	10	–	14	missing	missing	incomplete
68.126.68.	75	female	20	–	25	incomplete	incomplete	incomplete
68.126.69.	75a	male	45	–	60	incomplete	missing	incomplete
68.126.70.	76	?	20	–	40	incomplete	missing	incomplete
68.126.71.	77	female	25	–	30	incomplete	incomplete	incomplete
68.126.72.	78	female	20	–	75	missing	missing	incomplete
68.126.73.	79	male	50	–	60	incomplete	incomplete	incomplete
68.126.74.	80	female	25	–	30	incomplete	incomplete	incomplete
68.126.75.	81	?	15	–	18	incomplete	incomplete	incomplete
68.126.76.	82	female	30	–	40	incomplete	incomplete	incomplete
68.126.77.	84	male	30	–	40	incomplete	incomplete	incomplete
68.126.78.	86	male	20	–	25	well preserved	well preserved	incomplete
68.126.79.	87	?	7	–	9	incomplete	incomplete	incomplete
68.126.80.	88	male	20	–	40	incomplete	incomplete	incomplete
68.126.81.	89	female	25	–	30	incomplete	incomplete	incomplete
68.126.82.	90	?	0	–	1	incomplete	missing	missing
68.126.83.	91	?	3	–	4	incomplete	missing	incomplete
68.126.84.	92	female	20	–	25	incomplete	incomplete	incomplete
68.126.85.	93	female	30	–	35	incomplete	incomplete	incomplete
68.126.86.	94	male	30	–	40	incomplete	missing	incomplete
68.126.87.	95	female	20	–	30	incomplete	incomplete	incomplete
68.126.88.	96	?	6	–	7	incomplete	incomplete	incomplete
68.126.89.	97	female	40	–	60	incomplete	incomplete	incomplete
68.126.90.	98	?	20	–	75	missing	missing	incomplete
68.126.91.	99	?	2	–	6	incomplete	incomplete	incomplete
68.126.92.	100	female	20	–	60	incomplete	incomplete	incomplete
68.126.93.	101	?	3	–	4	incomplete	incomplete	incomplete
68.126.94.	102	?	7	–	8	incomplete	incomplete	incomplete
68.126.95.	103	male	45	–	50	incomplete	incomplete	incomplete
68.126.96.	104	male	40	–	50	incomplete	incomplete	incomplete
68.126.97.	107	?	12	–	14	incomplete	incomplete	incomplete
68.126.98.	108	female	30	–	35	incomplete	well preserved	incomplete
68.126.99.	109	female	25	–	35	well preserved	incomplete	incomplete

Table 2.

Some basic data of the human skeletal material of Somogyszil-Dögműt (cont'd)

Inventory number	Grave	Sex	Age			Skull	Mandible	Postcranial skeleton
68.126.100.	110	?	9	–	10	incomplete	incomplete	incomplete
68.126.101.	112	male	18	–	20	well preserved	well preserved	incomplete
68.126.102.	113/a	male	40	–	50	incomplete	incomplete	incomplete
68.126.103.	113/b	male	25	–	30	well preserved	well preserved	missing
68.126.104.	114	male	40	–	45	incomplete	incomplete	incomplete
68.126.105.	115	female	30	–	35	incomplete	incomplete	incomplete
68.126.106.	116	male	45	–	55	incomplete	incomplete	incomplete
68.126.107.	117	male	40	–	45	incomplete	incomplete	incomplete
68.126.108.	118	female	25	–	35	incomplete	incomplete	incomplete
68.126.109.	120	female	20	–	60	missing	missing	incomplete
68.126.110.	121	female	20	–	60	missing	missing	incomplete
68.126.111.	122	?	0	–	1	missing	missing	incomplete
68.126.112.	123	female	40	–	50	incomplete	incomplete	incomplete
68.126.113.	124	male	35	–	40	incomplete	incomplete	incomplete
68.126.114.	125	?	11	–	13	incomplete	incomplete	incomplete
68.126.115.	126	?	0	–	6	incomplete	missing	incomplete
68.126.116.	127	female	35	–	40	incomplete	incomplete	incomplete
68.126.117.	129	female	25	–	35	incomplete	incomplete	incomplete
68.126.118.	130	male	30	–	40	well preserved	well preserved	incomplete
68.126.119.	131	female	25	–	35	incomplete	incomplete	incomplete
68.126.120.	sporadic	female	45	–	50	well preserved	well preserved	incomplete
68.126.121.	sporadic	male	40	–	45	incomplete	incomplete	missing
68.126.122.	sporadic	?	11	–	13	incomplete	incomplete	incomplete
68.126.123.	sporadic	?	20	–	75	missing	missing	incomplete
68.150.1.	132	female	40	–	50	incomplete	incomplete	incomplete
68.150.2.	133	female	30	–	35	incomplete	incomplete	incomplete
68.150.3.	134	?	12	–	14	well preserved	well preserved	incomplete
68.150.4.	136	?	1	–	2	incomplete	missing	incomplete
68.150.5.	137	female	20	–	25	well preserved	incomplete	incomplete
68.150.6.	138	male	50	–	60	well preserved	incomplete	incomplete
68.150.7.	139	?	4	–	6	incomplete	incomplete	incomplete
68.150.8.	140	male	35	–	40	incomplete	missing	incomplete
68.150.9.	141	female	40	–	50	incomplete	incomplete	incomplete
68.150.10.	142a	?	6	–	7	incomplete	missing	incomplete
68.150.11.	142b	?	1	–	2	incomplete	missing	incomplete
68.150.12.	143	female	30	–	40	incomplete	incomplete	incomplete
68.126.13.	144	male	40	–	50	incomplete	well preserved	incomplete
68.150.14.	145	female	25	–	30	incomplete	well preserved	incomplete
68.150.15.	146	male	25	–	30	incomplete	well preserved	well preserved
68.150.16.	147	male	25	–	35	incomplete	well preserved	incomplete
68.150.17.	148	female	20	–	22	well preserved	well preserved	well preserved

Table 3.
Mortality table of the Somogyszil-Dölgút population

Age	Dead		Survivals entering (lx)	Life expectancy (ex)
	Number (Dx)	Percentage (dx)		
Whole population				
0	1.6	1.17	100.00	31.77
1–4	8.2	5.84	98.83	31.14
5–9	12.2	8.70	92.99	28.97
10–14	7.0	5.00	84.29	26.70
15–19	3.7	2.62	79.29	23.22
20–24	10.8	7.72	76.67	18.93
25–29	17.1	12.24	68.95	15.77
30–34	19.3	13.80	56.71	13.64
35–39	15.2	10.85	42.91	12.22
40–44	13.8	9.86	32.06	10.51
45–49	10.0	7.12	22.20	9.06
50–54	9.6	6.85	15.08	7.16
55–59	6.2	4.43	8.23	6.05
60–64	3.2	2.26	3.79	5.19
65–69	1.5	1.06	1.54	4.15
70–74	0.6	0.42	0.48	2.80
75–79	0.1	0.06	0.06	2.50
Total	140.0	100.00		
Males				
15–19	0.7	1.36	100	27.13
20–24	2.0	4.09	98.64	22.47
25–29	4.8	9.78	94.55	18.33
30–34	4.7	9.56	84.77	15.16
35–39	7.8	15.96	75.21	11.77
40–44	10.1	20.69	59.25	9.27
45–49	6.2	12.69	38.56	7.90
50–54	7.2	14.76	25.88	5.54
55–59	3.8	7.79	11.12	4.58
60–64	1.1	2.22	3.33	4.45
65–69	0.5	0.93	1.11	3.33
70–74	0.1	0.19	0.19	2.50
75–79	0.0	0.00	0.00	0.00
Total	49.0	100.00		
Females				
15–19	0.0	0.00	100	20.71
20–24	8.4	14.97	100.00	15.71
25–29	11.9	21.31	85.03	13.03
30–34	14.2	25.39	63.72	11.55
35–39	6.9	12.40	38.33	12.55
40–44	3.4	6.15	25.92	12.36
45–49	3.6	6.38	19.78	10.42
50–54	2.2	3.89	13.39	9.20
55–59	2.2	3.95	9.50	6.95

Table 3.
Mortality table of the Somogyszil-Dölgút population (cont'd)

Age	Dead		Survivals entering (Ix)	Life expectancy (ex)
	Number (Dx)	Percentage (dx)		
60–64	1.9	3.38	5.55	5.11
65–69	0.8	1.52	2.17	4.19
70–74	0.3	0.57	0.65	3.13
75–79	0.0	0.08	0.08	2.50
Total	56.0	100.00		

varied. The presence of maxillary torus is quite rare, whereas no shovel-shaped incisors occurs in the studied material. There are differences in the frequencies of palatinus torus and fossa praenasalis as well as in the occurrence of the curved and straight foreheads between the two sexes.

The metric data and indices of the skulls are presented in *Tables 5–6*, while *Table 7* shows the summary statistics of the skulls.

On the basis of the cranial indices, the majority of the late Roman community of Somogyszil-Dölgút can be characterized by a medium long/long (length–width index), low/moderately high (length–height index), and moderately high/high (height–width index) skull. Male foreheads are most often moderately wide or wide (transversal–frontoparietal index), whereas this index shows greater variability among females. Cranial capacity falls into the moderately large/large categories in both sexes. The face and upper face are medium wide/medium high in around half of the cases. Male orbits are usually low, whereas female orbits are low/moderately high. Nasal width varies in both sexes (*Table 8*).

For the calculation of the mean sigma ratio only the sigma ratios of those cranial measurements and indices were used that were composed of at least seven individual data. The mean sigma ratio of the cranial measurements is 103.53 for male skulls, and 102.08 for female skulls. The value for the cranial indices is 112.18 for males, and 137.21 for females respectively. Thus, the variability of the linear measurements (bearing information mainly about cranial size) indicates a natural population (the theoretical value for an average level of heterogeneity is 100.00), however the sigma ratios of the indices (bearing information about cranial shape) show a more mixed population, particularly for females, with a greater level of heterogeneity than that is typical for a natural population. This may suggest that the community was composed not just by local people, but some extralocal gene flow (immigrants that differed from the locals in their cranial shapes) were also present in it.

It is important to point out that due to the combined effect of the relatively small sample size and the poor preservation of the skeletal material the number of recorded cranial measurements and morphological attributes are rather small. Thus, every above mentioned result, and the conclusions drawn from it should be handled with caution as the small sample size goes along with an increased possibility of random effects that may influence the results.

Based on morphoscopic traits, every examinable skull belongs to the Caucasoid group. With respect to the traditional (and quite subjective, thus, in our opinion, “semi-scientific”) racial typology, it can be stated that Nordoid/Mediterranoid, Cromagnoid and archaic chamaecran types occurred in the population (*Figs 2–6*).

Mention must be made of the characteristics of the skulls recovered from burials whose S–N/N–S orientation differed from the period’s norm. Due to their poor preservation (which was among the worst in the excavated skeletal material) only a few measurements of a single female skull could be taken (Grave no. 70, *Fig. 7*), although the form and major proportions of the braincase of two further male skulls (Graves no. 41 and no. 50) could also be estimated, despite their fragmentation. A shared trait of these three skulls is that the length/width index of every one of them falls into the short (brachycran or hyperbrachycran) class category. The frequency of brachycran skulls is rather low in the cemetery: disregarding the female interred in Grave no. 70, from the altogether 32 skulls suitable to calculate the length/width index, only four fall into the brachycran/hyperbrachycran category. This marked difference suggests that these S–N/N–S oriented graves contained the burials of a (smaller) immigrant group whose anthropological characteristics differed in certain aspects from the local population. This possibility is indirectly further strengthened with the stature data presented below. In the lack of measurable/examinable skulls, we cannot use any traditional anthropological approach to identify the origin of this possibly immigrant group, but – to make

Table 4.
Distribution of the morphological characteristics of the skull in the population of Somogyszil-Dögmüt

Characteristics		Males		Females		Together	
		N	%	N	%	N	%
Cranium (norma verticalis)	Ellipsoid	4	16.67	3	12.00	7	14.29
	Ovoid	15	62.50	21	84.00	36	73.47
	Pentagonoid	3	12.50	1	4.00	4	8.16
	Sphenoid	0	0.00	0	0.00	0	0.00
	Spheroid	0	0.00	0	0.00	0	0.00
	Rhomboid	2	8.33	0	0.00	2	4.08
	Σ	24		25		49	
Forehead	Straight	5	16.67	18	62.07	23	38.98
	Curved	24	80.00	10	34.48	34	57.63
	Sloped	1	3.33	1	3.45	2	3.39
	Σ	30		29		59	
Occipital	Bathrocran	4	14.81	4	16.00	8	15.39
	Curvoccipital	23	85.19	20	80.00	43	82.69
	Planoccipital	0	0.00	1	4.00	1	1.92
	Σ	27		25		52	
Orbits	Rounded	6	50.00	11	57.89	17	54.84
	Rectangular	6	50.00	8	42.11	14	45.16
	Σ	12		19		31	
Lower margin of the apertura piriformis	Anthropin	10	55.56	13	81.25	23	67.65
	Fossa praenasalis	8	44.44	3	18.75	11	32.35
	Sulcus praenasalis	0	0.00	0	0.00	0	0.00
	Σ	18		16		34	
Spina nasalis anterior	Broca 1	0	0.00	0	0.00	0	0.00
	Broca 2	5	50.00	6	66.67	11	57.89
	Broca 3	2	20.00	3	33.33	5	26.32
	Broca 4	2	20.00	0	0.00	2	10.53
	Broca 5	1	10.00	0	0.00	1	5.26
	Σ	10		9		19	
Alveolar prognathism	Not present	5	38.46	9	69.23	14	53.85
	Moderate	8	61.54	4	30.77	12	46.15
	Strong	0	0.00	0	0.00	0	0.00
	Σ	13		13		26	
Torus palatinus	Not present	4	57.14	4	100.00	8	72.73
	Moderate	3	42.86	0	0.00	3	27.27
	Strong	0	0.00	0	0.00	0	0.00
	Σ	7		4		11	
Torus maxillaris	Not present	15	93.75	10	100.00	25	96.15
	Moderate	1	6.25	0	0.00	1	3.85
	Strong	0	0.00	0	0.00	0	0.00
	Σ	16		10		26	
Shovel-shaped incisor	Not present	3	100.00	3	100.00	6	100.00
	Present	0	0.00	0	0.00	0	0.00
	Σ	3		3		6	
Canine fossa	Shallow	9	45.00	5	26.32	14	35.90
	Moderately deep	5	25.00	11	57.89	16	41.02
	Deep	6	30.00	3	15.79	9	23.08
	Σ	20		19		39	

Table 5.
Male cranial measurements and indices in the population of Somogyszil-Dölgút

Martin	Grave No.											
No.	3	5/a	5/b	7	17	23	29	33	39	41	45	48
1	180	197	183	–	188	–	170	183	–	–	–	181
5	–	104	102	–	–	–	–	102	–	–	–	–
8	138	136	141	–	133	–	–	137	–	–	–	134
9	–	99	96	–	95	–	100	96	–	–	–	–
10	–	121	120	–	116	–	–	115	–	–	–	–
11	–	124	130	–	118	–	–	125	–	–	–	–
12	103	110	112	111	108	–	–	112	–	–	–	–
17	–	139	133	–	–	–	–	136	–	–	–	–
20	–	116	108	–	110	–	–	113	–	–	–	114
38	–	1494	1376	–	1363	–	–	1393	–	–	–	1369
40	–	103	–	–	–	–	–	–	–	–	–	–
43	–	107	106	–	105	106	105	103	–	–	–	109
45	–	133	140	–	–	–	–	136	–	–	–	131
46	–	100	–	–	–	–	–	–	–	–	–	97
47	–	115	–	–	–	–	–	–	–	–	–	121
48	–	72	–	–	–	–	–	–	–	–	–	71
51	–	43	42	–	–	–	–	42	42	–	–	45
52	–	33	35	–	–	–	–	30	–	–	–	30
54	–	–	–	–	–	–	–	–	27	–	–	26
55	–	–	–	–	–	–	–	–	48	–	–	51
62	–	51	–	–	–	–	–	–	47	–	–	47
63	–	–	–	–	–	–	–	–	–	–	–	42
65	–	126	–	–	120	–	–	129	137	–	125	–
66	–	–	111	–	102	–	–	115	105	98	105	–
69	–	33	–	–	31	–	–	36	37	31	35	38
70	–	68	69	–	58	–	–	62	70	62	62	62
71	–	39	30	28	29	–	31	33	34	31	32	36
8:1	76.67	69.04	77.05	–	70.74	–	–	74.86	–	–	–	74.03
17:1	–	70.56	72.68	–	–	–	–	74.32	–	–	–	–
17:8	–	102.21	94.33	–	–	–	–	99.27	–	–	–	–
20:1	–	58.88	59.02	–	58.51	–	–	61.75	–	–	–	62.98
20:8	–	85.29	76.60	–	82.71	–	–	82.48	–	–	–	85.07
9:8	–	72.79	68.09	–	71.43	–	–	70.07	–	–	–	–
47:45	–	86.47	–	–	–	–	–	–	–	–	–	92.37
48:45	–	54.14	–	–	–	–	–	–	–	–	–	54.20
52:51	–	76.74	83.33	–	–	–	–	71.43	–	–	–	66.67
54:55	–	–	–	–	–	–	–	–	56.25	–	–	50.98
63:62	–	–	–	–	–	–	–	–	–	–	–	89.36

Table 5.
Male cranial measurements and indices in the population of Somogyszil-Dőgkút (cont'd)

Martin	Grave No.											
No.	49	50	51	53	57	59	60	79	84	86	103	113/a
1	192	176	192	186	–	–	–	190	197	175	–	193
5	–	–	–	101	–	–	–	–	106	96	–	–
8	136	–	–	135	–	–	–	150	144	135	–	149
9	91	98	–	89	–	–	101	101	103	90	–	101
10	–	120	–	114	–	–	121	–	123	109	–	133
11	–	–	–	115	–	–	–	135	127	118	–	123
12	–	–	–	110	–	–	–	118	122	106	–	113
17	–	–	–	128	–	–	–	–	140	135	–	–
20	–	–	–	106	–	–	–	114	116	114	–	–
38	192	176	192	186	–	–	–	190	197	175	–	193
40	–	–	–	1331	–	–	–	1545	1560	1342	–	–
43	–	–	–	92	–	–	–	–	–	91	–	–
45	98	107	–	101	–	–	107	115	113	99	–	109
46	–	–	–	126	–	–	–	–	134	127	–	–
47	–	–	–	91	–	–	–	–	–	93	–	–
48	–	–	–	114	–	–	–	–	–	116	–	–
51	–	–	–	71	–	–	–	–	–	67	–	–
52	–	–	–	40	–	–	–	–	–	41	–	–
54	–	–	–	34	–	–	–	–	–	29	–	–
55	–	–	–	25	–	–	–	–	–	23	–	–
62	–	–	–	44	–	–	–	–	–	–	–	–
63	–	–	–	–	–	–	–	–	–	43	–	–
65	–	–	–	–	–	–	–	–	–	123	–	–
66	–	–	–	109	–	–	–	–	–	100	–	–
69	–	–	33	33	–	–	34	–	–	34	34	31
70	–	–	–	67	66	71	61	73	63	58	62	58
71	–	–	34	30	31	33	35	33	33	32	33	35
8:1	70.83	–	–	72.58	–	–	–	78.95	73.10	77.14	–	77.20
17:1	–	–	–	68.82	–	–	–	–	71.07	77.14	–	–
17:8	–	–	–	94.81	–	–	–	–	97.22	100.00	–	–
20:1	–	–	–	56.99	–	–	–	60.00	58.88	65.14	–	–
20:8	–	–	–	78.52	–	–	–	76.00	80.56	84.44	–	–
9:8	66.91	–	–	65.93	–	–	–	67.33	71.53	66.67	–	67.79
47:45	–	–	–	90.48	–	–	–	–	–	91.34	–	–
48:45	–	–	–	56.35	–	–	–	–	–	52.76	–	–
52:51	–	–	–	85.00	–	–	–	–	–	70.73	–	–
54:55	–	–	–	47.17	–	–	–	–	–	46.00	–	–
63:62	–	–	–	–	–	–	–	–	–	–	–	–

Table 5.
Male cranial measurements and indices in the population of Somogyszil-Döglút (cont'd)

Martin	Grave No.										
No.	113/b	114	116	117	124	130	138	140	144	146	147
1	184	–	–	–	187	181	183	–	–	194	182
5	95	–	–	–	–	–	–	–	–	–	–
8	149	–	–	–	138	152	135	–	145	146	138
9	97	99	–	100	97	89	96	93	–	105	94
10	119	–	–	–	119	–	116	120	–	125	117
11	130	–	–	–	123	126	123	–	–	128	122
12	118	–	–	–	106	118	114	–	117	–	107
17	–	–	–	–	–	–	–	–	–	–	–
20	115	–	–	–	–	111	118	–	–	122	–
38	1510	–	–	–	–	1474	1423	–	–	1621	–
40	–	–	–	–	–	–	–	–	–	–	–
43	108	–	–	108	107	98	105	103	–	111	102
45	133	–	–	–	–	–	135	–	–	144	–
46	97	–	–	–	95	–	–	–	–	103	–
47	106	–	–	–	125	126	–	–	–	118	–
48	66	–	–	–	79	74	63	69	–	74	–
51	44	–	–	–	41	40	42	43	–	45	–
52	34	–	–	–	–	31	30	36	–	33	–
54	24	–	–	–	–	26	25	26	–	23	–
55	48	–	–	–	–	53	44	56	–	52	–
62	43	–	–	–	–	–	48	–	–	46	–
63	45	–	–	–	–	–	–	–	–	43	–
65	123	–	–	–	120	127	–	–	–	122	–
66	108	–	–	–	107	105	–	–	–	103	105
69	26	30	–	–	29	34	36	–	–	34	29
70	–	55	74	55	52	66	64	–	66	70	60
71	29	30	30	32	32	31	40	–	31	36	27
8:1	80.98	–	–	–	73.80	83.98	73.77	–	–	75.26	75.82
17:1	–	–	–	–	–	–	–	–	–	–	–
17:8	–	–	–	–	–	–	–	–	–	–	–
20:1	62.50	–	–	–	–	61.33	64.48	–	–	62.89	–
20:8	77.18	–	–	–	–	73.03	87.41	–	–	83.56	–
9:8	65.10	–	–	–	70.29	58.55	71.11	–	–	71.92	68.12
47:45	79.70	–	–	–	–	–	–	–	–	81.94	–
48:45	49.62	–	–	–	–	–	46.67	–	–	51.39	–
52:51	77.27	–	–	–	–	77.50	71.43	83.72	–	73.33	–
54:55	50.00	–	–	–	–	49.06	56.82	46.43	–	44.23	–
63:62	104.65	–	–	–	–	–	–	–	–	93.48	–

Table 6.
Female cranial measurements and indices in the population of Somogyszil-Döggút

Martin	Grave No.											
No.	2	19	20	21	24	35	38	40	43	44	55	61
1	186	–	–	174	–	181	191	–	185	186	–	182
5	–	–	–	–	–	–	102	–	–	–	–	93
8	125	–	–	141	–	–	138	–	141	–	–	143
9	93	95	90	89	96	88	95	92	93	99	90	94
10	112	123	–	117	–	–	116	–	117	–	117	123
11	–	–	–	118	–	–	125	–	–	–	–	126
12	–	–	–	107	–	107	116	–	110	–	–	108
17	–	–	–	–	–	–	136	–	–	–	–	115
20	–	–	–	104	–	108	112	–	–	–	–	100
38	–	–	–	1253	–	–	1403	–	–	–	–	1272
40	–	–	–	–	–	–	94	–	–	–	–	86
43	102	100	–	97	101	101	104	100	–	–	97	99
45	–	–	–	–	–	–	129	–	–	–	–	133
46	–	–	–	–	–	–	99	91	–	–	92	88
47	–	–	–	–	–	–	116	105	–	–	–	93
48	–	–	–	–	–	–	70	63	–	–	60	58
51	42	–	–	40	–	–	42	40	–	–	39	39
52	35	–	–	36	–	–	33	34	–	–	30	33
54	–	–	–	–	–	–	24	24	–	–	23	23
55	–	–	–	–	–	–	51	48	–	–	44	48
62	–	–	–	–	–	–	42	–	–	–	–	–
63	–	–	–	–	–	–	–	–	–	–	–	–
65	–	–	118	116	–	–	125	–	–	–	–	123
66	100	–	94	86	95	–	99	96	–	91	–	86
69	34	–	26	–	34	–	33	26	–	29	28	–
70	–	49	52	59	55	–	61	56	56	54	–	54
71	30	27	30	27	28	–	34	33	31	29	–	29
8:1	67.20	–	–	81.03	–	–	72.25	–	76.22	–	–	78.57
17:1	–	–	–	–	–	–	71.20	–	–	–	–	63.19
17:8	–	–	–	–	–	–	98.55	–	–	–	–	80.42
20:1	–	–	–	59.77	–	59.67	58.64	–	–	–	–	54.95
20:8	–	–	–	73.76	–	–	81.16	–	–	–	–	69.93
9:8	74.40	–	–	63.12	–	–	68.84	–	65.96	–	–	65.73
47:45	–	–	–	–	–	–	89.92	–	–	–	–	69.92
48:45	–	–	–	–	–	–	54.26	–	–	–	–	43.61
52:51	83.33	–	–	90.00	–	–	78.57	85.00	–	–	76.92	84.62
54:55	–	–	–	–	–	–	47.06	50.00	–	–	52.27	47.92
63:62	–	–	–	–	–	–	–	–	–	–	–	–

Table 6.
Female cranial measurements and indices in the population of Somogyszil-Dölgút (cont'd)

Martin	Grave No.											
No.	67	68	70	71	75	92	93	108	109	115	118	123
1	163	186	168	–	167	–	168	168	179	–	–	180
5	–	–	–	–	–	–	–	–	105	–	–	–
8	–	142	150	141	–	–	–	143	134	–	–	138
9	88	98	96	100	–	–	95	95	98	85	–	95
10	–	–	129	–	–	–	–	122	–	112	–	117
11	–	128	126	–	–	–	–	121	118	–	–	–
12	–	116	107	–	–	–	107	112	104	–	–	106
17	–	–	–	–	–	–	–	–	134	–	–	–
20	–	110	120	–	–	–	–	115	116	–	–	–
38	–	1386	1430	–	–	–	–	1332	1340	–	–	–
40	–	–	–	–	–	–	–	–	101	–	–	–
43	93	105	105	105	–	–	99	105	–	95	–	–
45	–	–	–	–	–	–	–	–	129	–	–	–
46	–	–	–	–	–	–	–	–	–	–	–	–
47	–	–	–	–	–	–	–	–	118	–	–	–
48	64	–	–	–	–	–	–	–	74	–	–	–
51	39	41	43	42	–	–	–	–	42	–	41	–
52	32	35	33	33	–	–	–	–	34	–	35	–
54	–	–	–	–	–	–	–	–	25	–	–	–
55	46	–	–	–	–	–	–	–	52	–	–	–
62	–	–	–	–	–	–	–	–	43	–	–	–
63	–	–	–	–	–	–	–	–	40	–	–	–
65	–	122	–	–	–	–	121	122	–	–	–	–
66	–	99	95	–	–	–	96	88	–	–	–	–
69	26	33	–	30	–	29	32	32	32	26	25	–
70	55	62	61	–	–	–	59	54	55	–	52	53
71	30	33	33	32	–	31	34	31	34	–	29	33
8:1	–	76.34	89.29	–	–	–	–	85.12	74.86	–	–	76.67
17:1	–	–	–	–	–	–	–	–	74.86	–	–	–
17:8	–	–	–	–	–	–	–	–	100.00	–	–	–
20:1	–	59.14	71.43	–	–	–	–	68.45	64.80	–	–	–
20:8	–	77.46	80.00	–	–	–	–	80.42	86.57	–	–	–
9:8	–	69.01	64.00	70.92	–	–	–	66.43	73.13	–	–	68.84
47:45	–	–	–	–	–	–	–	–	91.47	–	–	–
48:45	–	–	–	–	–	–	–	–	57.36	–	–	–
52:51	82.05	85.37	76.74	78.57	–	–	–	–	80.95	–	85.37	–
54:55	–	–	–	–	–	–	–	–	48.08	–	–	–
63:62	–	–	–	–	–	–	–	–	93.02	–	–	–

Table 6.
Female cranial measurements and indices in the population of Somogyszil-Dölgút (cont'd)

Martin	Grave No.									
No.	127	131	stray finds	132	133	137	141	143	145	148
1	–	184	177	–	178	181	179	–	169	184
5	–	–	93	–	–	–	–	–	–	103
8	–	–	128	–	–	140	134	–	136	134
9	95	96	92	98	95	88	96	–	91	87
10	–	–	108	–	–	–	119	–	109	113
11	–	–	114	–	–	121	123	–	125	118
12	–	–	103	–	–	109	109	–	–	102
17	–	–	128	–	–	–	–	–	–	127
20	–	–	112	–	–	113	104	–	111	110
38	–	–	1248	–	–	1370	1232	–	1253	1313
40	–	–	–	–	–	–	–	–	–	98
43	–	105	100	–	106	94	103	–	97	98
45	–	–	125	–	–	124	–	–	131	122
46	–	–	92	–	88	82	–	–	93	90
47	–	–	110	–	–	108	–	–	99	107
48	–	–	66	–	–	63	–	–	62	66
51	–	–	41	–	–	39	–	–	41	40
52	–	–	35	–	–	32	–	–	30	31
54	–	–	23	–	25	23	–	–	25	26
55	–	–	53	–	–	47	–	–	45	47
62	–	–	42	–	–	–	–	–	–	44
63	–	–	–	–	35	37	–	–	46	43
65	–	–	111	–	–	–	–	–	117	113
66	–	98	97	–	–	90	90	103	99	99
69	–	–	30	–	29	31	–	31	26	29
70	56	62	63	55	67	59	54	58	58	52
71	29	36	30	29	33	30	35	27	29	33
8:1	–	–	72.32	–	–	77.35	74.86	–	80.47	72.83
17:1	–	–	72.32	–	–	–	–	–	–	69.02
17:8	–	–	100.00	–	–	–	–	–	–	94.78
20:1	–	–	63.28	–	–	62.43	58.10	–	65.68	59.78
20:8	–	–	87.50	–	–	80.71	77.61	–	81.62	82.09
9:8	–	–	71.88	–	–	62.86	71.64	–	66.91	64.93
47:45	–	–	88.00	–	–	87.10	–	–	75.57	87.70
48:45	–	–	52.80	–	–	50.81	–	–	47.33	54.10
52:51	–	–	85.37	–	–	82.05	–	–	73.17	77.50
54:55	–	–	43.40	–	–	48.94	–	–	55.56	55.32
63:62	–	–	–	–	–	–	–	–	–	97.73

Table 7.
Summary statistics of cranial measurements and indices in the population of Somogyszil-Dölgút

Martin	Males						Females					
No.	N	Vmax	Vmin	M	SD	S.R.	N	Vmax	Vmin	M	SD	S.R.
1	21	197	170	185.43	7.25	118.85	22	191	163	178.00	7.76	133.79
5	7	106	95	100.86	4.02	98.05	5	105	93	99.20	5.76	147.69
8	19	152	133	140.58	6.19	123.8	16	150	125	138.00	6.12	127.50
9	22	105	89	96.82	4.47	101.59	30	100	85	93.40	3.87	90.00
10	16	133	109	119.25	5.30	110.42	15	129	108	116.93	5.71	124.13
11	15	135	115	124.47	5.21	108.54	12	128	114	121.92	4.27	92.83
12	17	122	103	112.06	5.25	116.67	15	116	102	108.20	4.09	95.12
17	6	140	128	135.17	4.36	88.98	5	136	115	128.00	8.22	174.89
20	14	122	106	113.21	4.32	108.00	12	120	100	110.58	5.62	147.89
38	13	1620.61	1330.85	1446.34	93.79	83.74	12	1430.40	1231.85	1319.51	67.93	67.59
40	3	103	91	95.33	6.66	135.92	4	101	86	94.75	6.50	138.30
43	23	115	98	105.74	4.38	113.77	23	106	93	100.48	3.87	106.03
45	10	144	126	133.90	5.43	106.47	7	133	122	127.57	3.99	83.13
46	7	103	91	96.57	4.08	86.81	9	99	82	90.56	4.59	103.15
47	8	126	106	117.63	6.48	92.57	8	118	93	107.00	8.25	126.92
48	10	79	63	70.60	4.60	112.20	10	74	58	64.60	4.70	123.68
51	13	45	40	42.31	1.65	91.67	16	43	39	40.69	1.30	76.47
52	11	36	29	32.27	2.37	124.74	16	36	30	33.19	1.83	96.32
54	9	27	23	25.00	1.41	78.33	10	26	23	24.10	1.10	64.71
55	9	56	44	50.56	3.54	122.07	10	53	44	48.10	3.00	111.11
62	7	51	43	46.57	2.64	94.29	4	44	42	42.75	0.96	36.23
63	4	45	42	43.25	1.26	47.55	5	46	35	40.20	4.44	174.12
65	10	137	120	125.20	5.07	88.95	10	125	111	118.80	4.57	84.63
66	13	115	98	105.62	4.54	72.06	19	103	86	94.79	4.97	85.69
69	20	38	26	32.90	2.99	104.91	22	34	25	29.59	2.87	112.55
70	26	74	52	63.62	5.73	116.94	27	67	49	56.70	4.11	93.41
71	30	40	27	32.33	2.95	109.26	30	36	27	30.97	2.48	99.20
8:1	18	83.98	69.04	75.32	3.69	115.31	15	89.29	67.20	77.03	5.45	170.31
17:1	6	77.14	68.82	72.43	2.97	95.81	5	74.86	63.19	70.12	4.41	142.26
17:8	6	102.21	94.33	97.97	3.08	70.00	5	100.00	80.42	94.75	8.29	188.41
20:1	13	65.14	56.99	61.03	2.51	100.4	13	71.43	54.95	62.01	4.60	184.00
20:8	13	87.41	73.03	80.99	4.36	132.12	12	87.50	69.93	79.90	4.87	147.58
9:8	16	72.79	58.55	68.35	3.51	106.36	16	74.40	62.86	68.04	3.61	109.39
47:45	6	92.37	79.70	87.05	5.27	99.43	7	91.47	69.92	84.24	8.15	153.77
48:45	7	56.35	46.67	52.16	3.24	102.86	7	57.36	43.61	51.47	4.67	148.25
52:51	11	85.00	66.67	76.11	6.02	120.40	16	90.00	73.17	81.60	4.39	87.80
54:55	9	56.82	44.23	49.66	4.42	107.80	9	55.56	43.40	49.84	3.96	96.59
63:62	3	104.65	89.36	95.83	7.91	113.00	2	97.73	93.02	95.38	3.33	47.57

Fig. 2. Grave no. 5a; adult male; skull – anterior (A), semi-profile (B) and lateral view (C)

Fig. 3. Grave no. 38; adult female; skull – anterior (A), semi-profile (B) and lateral view (C)

Fig. 4. Grave no. 53; adult male; skull – anterior (A), semi-profile (B) and lateral view (C)

Fig. 5. Grave no. 61; adult female; skull – anterior (A), semi-profile (B) and lateral view (C)

Fig. 6. Grave no. 146; adult male; skull – anterior (A), semi-profile (B) and lateral view (C)

Fig. 7. Grave no. 70; adult female; skull – lateral view

Table 8.

Distribution of cranial indices of the population of Somogyszil-Dögműt in the class categories of ALEKSEYEV–DEBETZ 1964

Martin	Class category	Males			Females			Together	
No.			N	%		N	%	N	%
	<i>Hyperdolichokran</i>	–73.2	5	27.78	–74.1	4	26.67	9	27.27
8:1	<i>Dolichokran</i>	73.3–76.4	6	33.33	74.2–77.3	6	40.00	12	36.36
	<i>Mesokran</i>	76.5–79.9	5	27.78	77.4–80.8	2	13.33	7	21.21
	<i>Brachykran</i>	80.0–83.1	1	5.56	80.9–84.0	1	6.67	2	6.06
	<i>Hyperbrachykran</i>	83.2–	1	5.56	84.1–	2	13.33	3	9.09
		Σ	18			15		33	
17:1	<i>Hyperchamaekran</i>	–69.2	1	16.67	–69.4	2	40.00	3	27.27
	<i>Chamaekran</i>	69.3–72.3	2	33.33	69.5–72.5	2	40.00	4	36.36
	<i>Orthokran</i>	72.4–75.6	2	33.33	72.6–75.8	1	20.00	3	27.27
	<i>Hypsikran</i>	75.7–78.7	1	16.67	75.9–78.9	0	0.00	1	9.09
	<i>Hyperhypsikran</i>	78.8–	0	0.00	79.0–	0	0.00	0	0.00
		Σ	6			5		11	
	<i>Hyperchamaekran</i>	–59.4	5	38.46	–59.6	4	30.77	9	34.62
20:1	<i>Chamaekran</i>	59.5–61.8	3	23.08	59.7–62.0	3	23.08	6	23.08
	<i>Orthokran</i>	61.9–64.7	4	30.77	62.1–64.9	3	23.08	7	26.92
	<i>Hypsikran</i>	64.8–67.1	1	7.69	65.0–67.3	1	7.69	2	7.69
	<i>Hyperhypsikran</i>	67.2–	0	0.00	67.4–	2	15.38	2	7.69
		Σ	13			13		26	
	<i>Hypertapeinokran</i>	–87.9	0	0.00	–87.1	1	20.00	1	9.09
17:8	<i>Tapeinokran</i>	88.0–92.3	0	0.00	87.2–91.4	0	0.00	0	0.00
	<i>Metriokran</i>	92.4–97.0	2	33.33	91.5–96.1	1	20.00	3	27.27
	<i>Akrokran</i>	97.1–101.4	3	50.00	96.2–100.4	3	60.00	6	54.55
	<i>Hyperakrokran</i>	101.5–	1	16.67	100.4–	0	0.00	1	9.09
		Σ	6			5		11	
	<i>Hypertapeinokran</i>	–75.8	1	7.69	–75.1	2	16.67	3	12.00
20:8	<i>Tapeinokran</i>	75.9–78.9	4	30.77	75.2–78.2	2	16.67	6	24.00
	<i>Metriokran</i>	79.0–82.8	3	23.08	78.3–82.1	6	50.00	9	36.00
	<i>Akrokran</i>	82.9–85.9	4	30.77	82.2–85.2	0	0.00	4	16.00
	<i>Hyperakrokran</i>	86.0–91.8	1	7.69	85.3–91.0	2	16.67	3	12.00
		Σ	13			12		25	
	<i>Hyperstenometop</i>	–62.7	1	6.25	–63	1	6.25	2	6.25
9:8	<i>Stenometop</i>	62.8–66.0	2	12.50	63.1–66.3	5	31.25	7	21.88
	<i>Metriometop</i>	66.1–69.6	6	37.50	66.4–69.9	5	31.25	11	34.38
	<i>Eurymetop</i>	69.7–72.9	7	43.75	70.0–73.2	4	25.00	11	34.38
	<i>Hypereurymetop</i>	73.0–	0	0.00	73.3–	1	6.25	1	3.13
		Σ	16			16		32	

Table 8.

Distribution of cranial indices of the population of Somogyuszil-Dölgút in the class categories of ALEKSEYEV–DEBETZ 1964 (cont'd)

Martin	Class category	Males			Females			Together	
No.			N	%		N	%	N	%
	<i>Hyperoligenkephal</i>	–1227	0	0.00	–1096	0	0.00	0	0.00
	<i>Oligenkephal</i>	1228–1337	1	7.69	1097–1195	0	0.00	1	4.00
38	<i>Euenkephal</i>	1338–1462	6	46.15	1196–1307	5	41.67	11	44.00
	<i>Aristenkephal</i>	1463–1572	5	38.46	1308–1406	6	50.00	11	44.00
	<i>Hyperaristenkephal</i>	1573–	1	7.69	1407–1582	1	8.33	2	8.00
	Σ		13			12		25	
	<i>Hypereuryprosop</i>	–80.5	1	16.67	–80.1	2	33.33	3	25.00
47:45	<i>Euryprosop</i>	80.6–85.8	1	16.67	80.2–85.4	0	0.00	1	8.33
	<i>Mesoprosop</i>	85.9–91.6	3	50.00	85.5–91.1	4	66.67	7	58.33
	<i>Leptoprosop</i>	91.7–96.9	1	16.67	91.2–96.4	0	0.00	1	8.33
	<i>Hyperleptoprosop</i>	97.0–	0	0.00	96.5–	0	0.00	0	0.00
	Σ		6			6		12	
	<i>Hypereuryen</i>	–48.3	1	14.29	–48.1	2	28.57	3	21.43
48:45	<i>Euryen</i>	48.4–51.4	2	28.57	48.2–51.2	1	14.29	3	21.43
	<i>Mesen</i>	51.5–54.9	3	42.86	51.3–54.7	3	42.86	6	42.86
	<i>Lepten</i>	55.0–58.0	1	14.29	54.8–57.8	1	14.29	2	14.29
	<i>Hyperlepten</i>	58.1–	0	0.00	57.9–	0	0.00	0	0.00
	Σ		7			7		14	
	<i>Hyperchamaekonch</i>	–73.8	5	45.45	–76.4	1	6.25	6	22.22
52:51	<i>Chamaekonch</i>	73.9–78.7	3	27.27	76.5–81.5	6	37.50	9	33.33
	<i>Mesokonch</i>	78.8–84.3	2	18.18	81.6–87.3	8	50.00	10	37.04
	<i>Hypsikonch</i>	84.4–89.2	1	9.09	87.4–92.4	1	6.25	2	7.41
	<i>Hyperhypsikonch</i>	89.3–	0	0.00	92.5–	0	0.00	0	0.00
	Σ		11			16		27	
	<i>Hyperleptorrhin</i>	–42.5	0	0.00	–43.3	0	0.00	0	0.00
54:55	<i>Leptorrhin</i>	42.6–46.6	3	33.33	43.4–47.5	2	22.22	5	27.78
	<i>Mesorrhin</i>	46.7–51.1	4	44.44	47.6–52.1	4	44.44	8	44.44
	<i>Chamaerrhin</i>	51.2–55.2	0	0.00	52.2–56.3	3	33.33	3	16.67
	<i>Hyperchamaerrhin</i>	55.3–	2	22.22	56.4–	0	0.00	2	11.11
	Σ		9			9		18	
	<i>Hyperleptostaphylin</i>	–75.7	0	0.00	–75.8	0	0.00	0	0.00
63:62	<i>Leptostaphylin</i>	75.8–82.6	0	0.00	75.9–82.7	0	0.00	0	0.00
	<i>Mesostaphylin</i>	82.7–90.3	1	33.33	82.8–90.5	0	0.00	1	20.00
	<i>Brachystaphylin</i>	90.4–97.2	1	33.33	90.6–97.4	1	50.00	2	40.00
	<i>Hyperbrachystaphylin</i>	97.3–	1	33.33	97.5–	1	50.00	2	40.00
	Σ		3			2		5	

a merely hypothetical proposal – it should here be recalled that during this period brachycranic skulls were frequent among populations of presumably Sarmatian origin and/or populations with a significant Sarmatian component.

Metric characteristics of the postcranial skeleton, estimated stature

The individual postcranial measurements and the estimated stature are presented in *Tables 9–10*. The mean height of males is 165.94 cm, while it is 156.86 cm for females. Taking a look at the N–S/S–N oriented burials, it can be seen that three males from those graves were suitable for stature calculation (Grave no. 18: 171.33 cm; Grave no. 41: 166.05 cm; Grave no. 50: 174.33 cm). If they are excluded from the stature mean calculation, the average height of males lowers to 165.31 cm. Two of these three males (Grave no. 18 and Grave no. 50) had a stature significantly exceeding this mean value. Although far-reaching conclusions can hardly be drawn owing to the extremely low number of cases, if this record is viewed together with the data on skulls, it indirectly underpins the assumption that the N–S/S–N oriented graves contained the burials of an immigrant group that in terms of certain anthropological traits differed substantially from the overwhelming majority of the community using the cemetery.

The average stature (calculated from the lower limb bones) of the population of the Carpathian Basin during the Roman Age was 166.09 cm for males, and 156.91 cm for females.²⁷ The average height of the Somogyszil-Döggúti dűlő population fits nicely into this picture.

Traumas and injuries

The frequency of fractures and other injuries caused by accidents or interpersonal violence is fairly low in the Somogyszil-Döggúti dűlő population. Fracture of the lower limb was identified in one case: a healed fracture was found in the proximal third of the right fibula of an adult woman interred in Grave no. 16. Healed fractures of the upper limb was noted in three cases: a woman buried in Grave no. 20 had broken her right ulna near the distal end, a mid diaphyseal fracture healed with an angulation was observed on the left radius of the man interred in Grave no. 23 (*Fig. 8*), and a mature man in Grave no. 41 had broken his left radius in the distal third. In addition, one other bone trauma was found: an ~ 11 mm long healed depressed fracture probably caused by a moderately sharp implement was identified on the left parietal bone of an elderly woman from Grave no. 19 (*Fig. 9*).

Biological distance between Somogyszil-Döggúti dűlő and other archaeological populations

The pairwise Penrose distances (C_R^2 : “size” and “shape” combined) between the Somogyszil-Döggúti dűlő and other male cranial series are presented in *Table 11*.

From the comparative male cranial series below the 1% error band ($C_R^2 \leq 0.196$) are the late Roman period sites of Esztergom-Bánomi dűlő ($C_R^2 = 0.096$), Keszthely-Dobogó ($C_R^2 = 0.183$) and Tác-Margittelep ($C_R^2 = 0.188$), the Avar period series of Kaposvár-Road 61, Site 26 ($C_R^2 = 0.054$), Toponár-40-es őrház [Toponár watchman’s house No. 40] ($C_R^2 = 0.075$), Zalakomár-Lesvári dűlő II ($C_R^2 = 0.076$), Kereki-Homokbánya ($C_R^2 = 0.100$), Keszthely-Város ($C_R^2 = 0.121$), Kaposvár-Fészerlakpuszta ($C_R^2 = 0.148$), Zelovce (Zsély) ($C_R^2 = 0.154$) and Virt ($C_R^2 = 0.194$). Cranial series below the 2% error band ($C_R^2 < 0.235$) are the Keszthely burial ground uncovered by Vilmos Lipp and assigned to the Keszthely culture ($C_R^2 = 0.200$), and the Late Avar period cemeteries of Tiszaderzs ($C_R^2 = 0.213$) and Nové Zámky (Érsekújvár) ($C_R^2 = 0.229$).

The biological distance-based relations of the close analogies of Somogyszil-Döggúti dűlő male cranial series is visualized by a dendrogram (*Fig. 10*). Accordingly, Somogyszil-Döggúti dűlő clusters together with the Avar period populations of Kaposvár-Road 61, Site 26, Toponár 40-es őrház [Toponár watchman’s house No. 40] and Kereki-Homokbánya. This joins together still within the 1% error band threshold value (0.196) with an other cluster composed of the Avar period series of Kaposvár-Fészerlakpuszta and Zalakomár-Lesvári dűlő II, and the

²⁷ ÉRY 1998.

Fig. 8. Grave no. 23; adult male; fracture of the left radius healed with an angulation (A, B)

Fig. 9. Grave no. 19; senile female; healed depressed fracture on the left parietal bone

Fig. 10. Dendrogram showing the relations among the male cranial series of Somogyszil-Döggút and its close (below the 2% or 1% error band) analogies – Penrose distance, UPGMA hierarchical clustering method

Table 9.

The M1 measurement of long bones, and the calculated statures of the males of Somogyszil-Dölgút

Grave	Humerus		Ulna		Radius		Femur		Tibia		Fibula		Calculated stature (cm)
No.	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	
17							447	446	367				166.86
18	319						463	463		365			171.33
27	316	305	259	258			424	426		342			161.04
29			272				432	438					163.75
33	309	303			233	232	421	422		346			160.09
39	300	295							343				160.19
41	315						441	446	350				166.05
45	324				241				362				166.44
46	324		260		243		433	423	349	339			161.85
48					243	238	444						166.18
50	326								386				174.33
51	324		254	250	236	231	427		345	346			161.58
53	329	323	277	273	253	253	432						162.93
59					240								
60							456			376			169.44
79		315						458					169.98
84	339				253								
86					234			432	353				162.93
103							452						168.35
113a					282		440						165.10
116		324											
124							408	411					156.83
130	334	323		271		247	452	450	379	382			168.08
138								469					172.96
140							468	454					170.79
144							452						168.35
146	323	317	277	279	249		468	463	391	385			172.01
147		304				225	425						161.04

Table 10.

The M1 measurement of long bones, and the calculated statures of the females of Somogyszil-Döggút

Grave	Humerus		Ulna		Radius		Femur		Tibia		Fibula		Calculated stature (cm)
No.	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	
16	314	311				225	421	423					160.22
19								393					152.36
20		288	243				400	398					153.99
21			244				408		340	338			156.43
24							409		325				156.70
26											325		
36			251		228								
38	303	300		225			437	439	356	356			163.61
40	281						405	404	323	323			155.48
43	303	300					410	407	351	344			156.56
44		281				203	398	392	310	306			152.91
55							412	421					158.46
61				229	216	212		415	333	331			158.33
89					203		393			319			152.36
92				266									
97		286											
108							409	410	340	337			156.83
109	296					219							
115	266							378					148.30
127							419			327			159.41
131	322												
133							431						162.66
143								428					161.85
145	301	297			219		421	422	342				160.09
148	283	275	242	239	215	216	400	399	321	319	318	308	153.72

Table 11.
Penrose distance between the male cranial series of Somogyszil-Dölgút and other comparative series

Male cranial series	PENROSE distance (size and shape) C ^{R2}
* = below the 2% error band; *** = below the 1% error band	
Carpathian Basin, ~2nd–5th centuries	
Budapest, III. kerület, Kaszás dűlő, Raktárrét (FRÁTER 1993)	0.453
Esztergom-Bánomi dűlő (MERCZI 2008)	0.089***
Keszthely-Dobogó (VARGA <i>et al.</i> 2005)	0.183***
Pécs (Geisler Eta utca 8. and 14., István tér 12.) (ÉRY 1973)	0.240
Tác-Margittelep (ÉRY 2000)	0.188***
Tokod (ÉRY 1981)	0.348
Visegrád-Dió (MERCZI 2001)	0.236
Carpathian Basin, 5th–8th centuries	
Adorján-Ország (BARTUCZ–FARKAS 1957)	0.449
Alattán-Tulát (WENGER 1957)	0.754
Ártánd-Kapitány (ÉRY 1966)	0.308
Bačko Petrovo Selo (Péterréve) (ÉRY 1990)	0.430
Bácska-Topolya (FARKAS–MARCSIK 1984)	2.418
Bágyoszovát-Gyűrhegy (DEZSŐ 1968)	0.534
Csákerény-Orondpuszta (ÉRY 2001a)	0.443
Előszállás-Bajcsihegy (WENGER 1966)	1.377
Gyenesdiás (T. RENDES–TÓTH 2000)	0.611
Holiare (Gellér) (MALA <i>cit.</i> RÖSING–SCHWIDETZKY 1977)	0.373
Jánoshida-Tótképuszta (WENGER 1953)	1.021
Kassa-Zsebes (THURZO 1984)	0.251
Kaposvár 61-es út 26. lelőhely [Kaposvár, Road 61, Site 26] (based on the unpublished remeasurement data of ÉVINGER) ²⁸	0.054***
Kaposvár-Fészerlakpuszta (based on the unpublished remeasurement data of ÉVINGER) ²⁹	0.148***
Kecel I. (LIPTÁK 1954)	0.715
Kereki-Homokbánya (based on the unpublished remeasurement data of ÉVINGER) ³⁰	0.100***
Keszthely, Lipp féle feltárás [V. Lipp's excavation] (VARGA <i>et al.</i> 2003)	0.200*
Keszthely-Város (based on the unpublished remeasurement data of ÉVINGER) ³¹	0.121***
Kékesd (WENGER 1968)	0.700
Kiskőrös-Város (LIPTÁK 1983)	0.526
Kiszombor (BARTUCZ 1936)	0.680
Langobards – merged series (Hungary and Austria, 5 th –7 th centuries) (<i>cit.</i> RÖSING–SCHWIDETZKY 1977)	0.242
Lesencetomaj (BIRÓ 1999)	0.355
Loebersdorf (GREFEN–PETERS 1987)	3.201
Madaras-Téglavető (LIPTÁK–MARCSIK 1976)	1.289
Moravica (Bácskossuthfalva) (CZÉKUS 1985)	1.046
Nové Zámky (Érsekújvár) (VLADAROVA <i>et al.</i> , <i>cit.</i> RÖSING–SCHWIDETZKY 1977)	0.229*
Pókaszeptek (based on the unpublished remeasurement data of ÉVINGER) ³²	0.604
Siófok-Kiliti (SUSKOVICS 1993)	0.599
Solymár (FERENCZ 1983)	0.344

²⁸ The original metric data providing publication: ÉVINGER–BERNERT 2005.

²⁹ The original metric data providing publications: WENGER 1975, FÓTHI 1988.

³⁰ The original metric data providing publication: BERNERT 2003.

³¹ The original metric data providing publication: WENGER 1977.

³² The original metric data providing publication: BOTTYÁN 1975.

Table 11.

Penrose distance between the male cranial series of Somogyszil-Dölgút and other comparative series (cont'd)

Male cranial series	PENROSE distance (size and shape) C ^{R2}
* = below the 2% error band; *** = below the 1% error band	
Sükösd-Ságod (KÓHEGYI–MARCSIK 1971)	0.542
Szebény (TÓTH 1961)	0.336
Szeged-Fehértó (LIPTÁK–VAMOS 1969)	0.738
Szeged-Kundomb (LIPTÁK–MARCSIK 1966)	0.463
Szeged-Makkoserdő (VAMOS 1973)	0.678
Szekszárd-Palánk (LIPTÁK 1974)	0.382
Szentes-Kaján (WENGER 1955)	0.925
Tiszaderzs (based on the unpublished remeasurement data of ÉVINGER) ³³	0.213*
Tiszavárkony (LIPTÁK 1955a)	0.727
Toponár 40-es őrház [Toponár, watchman's house No. 40] (based on the unpublished remeasurement data of ÉVINGER) ³⁴	0.075***
Üllő I. (LIPTÁK 1955b)	0.625
Üllő II. (LIPTÁK 1955b)	0.710
Vác-Kavicsbánya (FERENCZ 1981)	0.334
Virt (HANÁKOVÁ <i>et al</i> 1970)	0.194***
Zalakomár-Lesvári dűlő II. (ÉRY 2001b)	0.076***
Želovce (Zsély) (HANÁKOVÁ–STLOUKAL 1974)	0.154***
Zwölfaxing (SZILVÁSSY 1980)	0.256

Roman period cemeteries of Esztergom-Bánomi dűlő and Tác-Margittelep. The other series fall outside of this threshold, and thus, connect to Somogyszil-Dölgúti dűlő more loosely.

With regard to the geographical distribution, the close analogies of the late Roman period population of Somogyszil-Dölgúti dűlő are all from Transdanubia, with a single exception (Tiszaderzs). With respect to the dating of these series, parallels can be found both in the Roman and in the Avar period. Viewed in a broader perspective, this indicates a continuity in the selected cranial measurements from the Roman into the Avar period on the territory of Transdanubia. On a theoretical level, this result may suggest a significant continuity of the local populations, or it may indicate that a large part of those groups that probably immigrated and settled down in the territory during the 5th–8th centuries possessed similar craniometric features as the locals had, or the combination of the two. However, with the present analysis, this question cannot be answered.

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³³ The original metric data providing publication: LEBZELTER 1957.

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³⁴ The original metric data providing publication: WENGER

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