

## THE MESOLITHIC–NEOLITHIC TRANSITION IN THE YUGOSLAVIAN IRON GATE

L. Szathmáry,

Department of Evolutionary Zoology and Human Biology, Kossuth Lajos University, Debrecen, Hungary

*Abstract: The author compared 140 Mesolithic and early Neolithic cranial finds from the Yugoslavian Iron Gate region and its surrounding areas by the application of a principal component analysis and an angular transformation. As his results present even in the Iron Gate region, which shows remarkable local Mesolithic–Neolithic surviving, there can be proved a break in the population history. This break in the transition period may have been represented by the Lepenski Vir culture in the formation of which primarily southern, Balkanian influences and local precedings with exogamous profile played an important part.*

*Key words: Mesolithic; Neolithic; Iron Gate; Carpathian Basin.*

### Introduction

The Iron Gate region is one of the exceptional territories of Europe in which the skeletal finds of the Mesolithic and the early Neolithic as well as of the transitional period between the two have been excavated and published (Srejović 1972; Srejović & Letica 1978). In both the Balkans and the Carpathian Basin only early Neolithic skeletons of the mentioned periods have been known so far; that is why the analysis of the Iron Gate cranial finds are of particular importance to forming an opinion of the anthropological profile of the transitional period of these territories.

### Materials and Methods

The typical Mesolithic sample of the Iron Gate region (Vlasac) was followed chronologically by the remains of the Lepenski Vir culture (LVC) of the transitional period (Lepenski Vir, Padina), at last the early Neolithic crania of the Starčevo culture (Lepenski Vir) datable approximately between 7000 and 5000 B. C. constituted the basic material of the examinations (Table 1).

The comparative material only constituted of early Neolithic cranial finds. The skulls of the Karanovo horizon, of the Starčevo and of the Körös–Criş cultures, south, north and northeast of the Iron Gate region, respectively, represented approximately the overlapping period (5600–4500 B. C.). The crania of the Alföld Linear Pottery (ALP) alongside the river Tisza and of the Middle European Linear Pottery (MELP) developing west and north of the Danube are younger (4600–4000 B. C.) than the previously mentioned one. Thus altogether 70 male and 70 female individuals were examined.

The analysis of the non-metric traits was based on 20 cranial characteristics. The MMD (Mean Measure of Divergence) values and the variances were computed by the method of Grewall (1962) and Smith (1977; cf. Sjøvold 1976, 1977). The principal component analysis of the metrical traits involved 10 cranial measurements: M1=Martin (1928) N<sup>o</sup>1, M8, M9, M20, M45, M48, M51, M52, M54, M55. Only those cranial finds were included in the examinations in the case of which at least 4 of the 10 traits analysed were available. The missing items were reconstructed by Dear's (1959) method. The extracted factors were separated by Kaiser's (1960) criteria and non-standardized factor

scores of the individuals were clustered on the Euclidean distance by the following definition:

$$D(K,I) = \text{Min} [D(P,I) ; D(Q,I)].$$

Table 1. List of the Finds

Findspots	Males		Females	
	N	No. on the Tree	N	No. on the Tree
<b>YUGOSLAVIAN IRON GATE</b>				
<i>Mesolithic</i>				
Vlasac	19	1-19	15	1-15
<i>Lepenski Vir Culture (LVC)</i>				
Lepenski Vir	6	20-25	1	16
Padina	1	26	-	-
<i>Starčevo Culture</i>				
Lepenski Vir	8	27-34	9	17-25
<b>SURROUNDING EARLY NEOLITHIC CULTURES</b>				
<i>Karanovo horizon</i>				
Anza (YU)	1	35	1	26
Devetaska Cave (BG)	1	36	-	-
Jassa Tepe (BG)	-	-	1	27
Karanovo (BG)	1	37	3	28-30
Kasanlak (BG)	-	-	1	31
Nea Nikomedeia (G)	5	38-42	7	32-38
<i>Starčevo Culture</i>				
Divostin (YU)	-	-	1	39
Lánycsók (H)	-	-	1	40
<i>Körös-Cris Culture</i>				
Birlad (RO)	-	-	1	41
Deszk (H)	-	-	2	42-43
Endrőd (H)	1	43	-	-
Gura Baciului (RO)	-	-	1	44
Hódmezővásárhely-Kotac-Vata (H)	6	44-49	3	45-47
Solca (RO)	1	50	-	-
Szajol-Felsőföld (H)	-	-	1	48
Vaskút (H)	1	51	-	-
<i>Alföld Linear Pottery (ALP)</i>				
Büdöspet Cave (H)	-	-	1	49
Hillebrand Cave (H)	-	-	1	50
Mezőcsát-Csometekert (H)	1	52	-	-
Tiszaölk-Hajnalos (H)	-	-	1	51
Vadna (H)	1	53	-	-
Zaránk (H)	1	54	-	-
<i>Middle European Linear Pottery (MELP)</i>				
Nitra-Norný Krškany (CS)	15	55-69	19	52-70
Pötsching (A)	1	70	-	-

## Results and Discussion

Besides the Mesolithic and the transitional (LVC) Iron Gate sequences it is the series of the three early Neolithic cultures, the Starčevo, the Körös-Criş and the MELP, that can also be analysed by the non-metric traits (Table 2). Since nowhere within the respective series does the manifested frequency of the 20 involved traits show significant sexual differences, the results can therefore be demonstrated on the common sample of the males and females. We can perceive that it is only the Mesolithic and transitional period of the Iron Gate region and the Starčevo sequence, by far the greater part of which also originates from the same region, between which no significant difference appears. In the case of all the other compared pairs significant differences can be pointed out.

Table 2. The MMD Distances (up) and the variances (down) for Both Sexes

Samples	Iron Gate (Mesolithic and LVC)	Starčevo	Körös-Criş
<i>Starčevo</i>	0.042		
	0.002		
<i>Körös-Criş</i>	0.100*	0.101*	
	0.000	0.002	
<i>MELP</i>	0.090*	0.095*	0.128*
	0.002	0.002	0.003

\*Significant differences ( $p < 0.05$ )

Three principal components could be extracted in the case of the metrical traits. By these the 65 and 64 per cents of the total variance in the case of males and females could be expressed, respectively. The communalities (Table 3) in both sexes are relatively high in the cases of 6 variables and relatively low in the case of 3 variables. The correlations of the finds are demonstrated on the cluster trees drawn according to the extracted factor scores (Figures 1 and 2).

Table 3. The Extracted Principal Components: Unrotated Loadings and the Communalities (CO)

Variable	Males				Females			
	PC 1	PC 2	PC 3	CO	PC 1	PC 2	PC 3	CO
M1	0.51	-0.16	-0.61	0.80	0.63	-0.02	0.53	0.75
M8	0.65	0.21	0.27	0.66	0.53	0.10	-0.38	0.47
M9	0.79	0.22	-0.13	0.81	0.51	0.61	0.06	0.71
M20	0.55	0.37	-0.40	0.69	0.50	0.14	-0.47	0.66
M45	0.89	0.16	0.03	0.82	0.81	0.19	0.06	0.71
M48	0.76	-0.21	0.30	0.71	0.75	-0.27	0.39	0.82
M51	0.75	0.14	0.00	0.59	0.67	0.11	-0.43	0.67
M52	0.37	-0.63	0.29	0.77	0.59	-0.54	0.01	0.84
M54	0.05	0.55	0.59	0.91	-0.12	0.68	0.33	0.86
M55	0.57	-0.57	0.41	0.67	0.82	-0.06	0.06	0.81

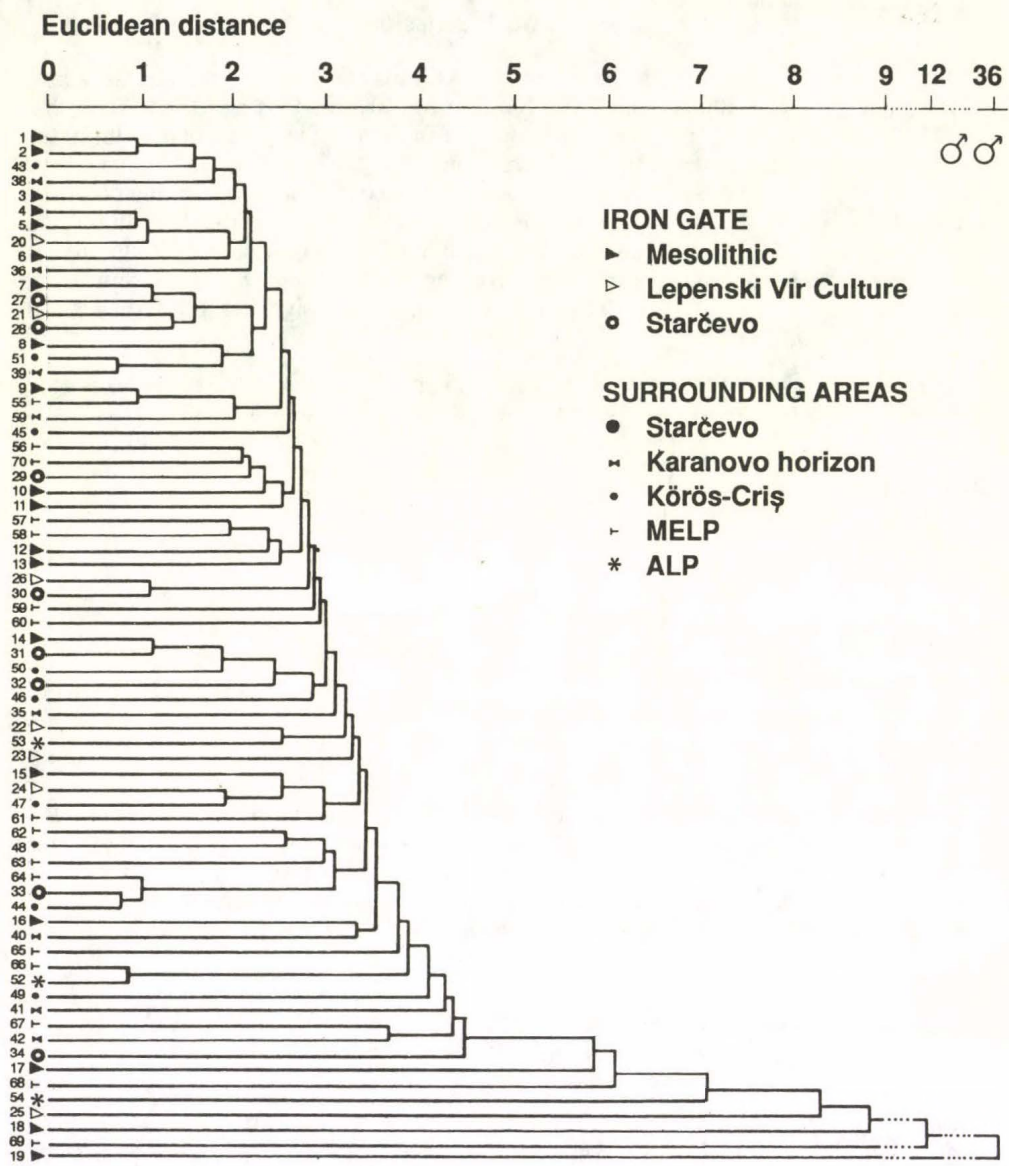


Fig. 1: The cluster tree of the male skulls by the non-standardized scores of the three extracted principal components.

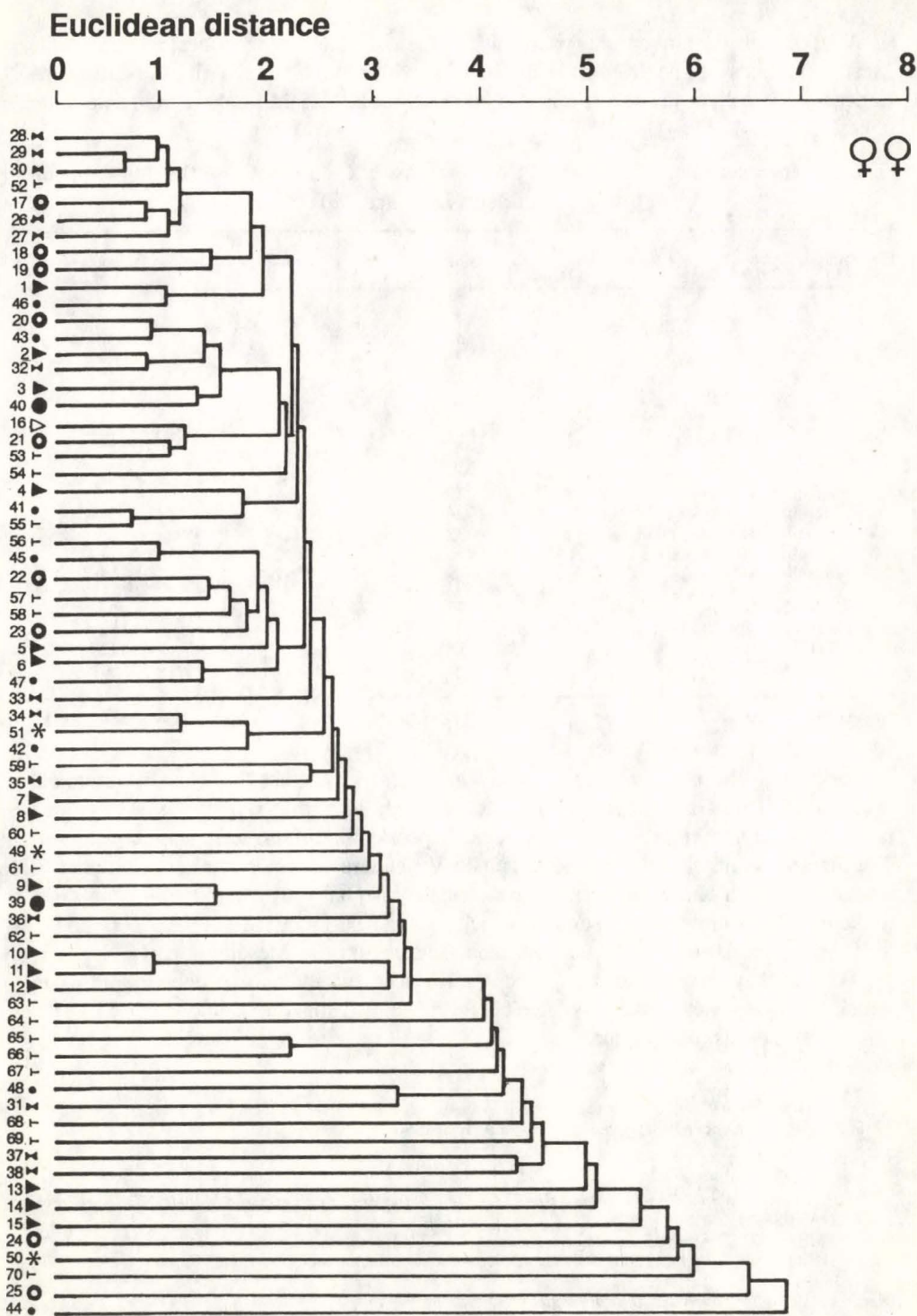


Fig. 2: The cluster tree of the female skulls by the non-standardized scores of the three extracted principal components. (For key to the signs used see Fig. 1.)

What seems certain on the basis of all these is the strong cohesion within the Mesolithic finds of the Iron Gate as well as within the Starčevo finds. Neither the Lepenski Vir culture nor the Körös-Criş culture could be said to show the same inner cohesive force (Table 4).

**Table 4. Intraserial and Interserial Connections (IAC and IRC) on the 2.0 Value of the Euclidean Distance (%)**

Connections	Males	Females	Together
<b>IAC</b>			
Mesolithic	32	27	30
LVC	0	—*	0
Starčevo	25	64	45
Karanovo horizon	0	38	19
Körös-Criş	0	0	0
MELP	13	11	12
<b>IRC</b>			
Mesolithic+LVC	25	—	25
Mesolithic+Starčevo	24	37	33
Mesolithic+Karanovo horizon	32	26	29
Mesolithic+Körös-Criş	30	32	31
Mesolithic+MELP	6	12	9
LVC+Starčevo	33	—	33
LVC+Karanovo horizon	0	—	0
LVC+Körös-Criş	13	—	13
LVC+MELP	0	—	0

\*It cannot be estimated

Concerning the interserial connections it is remarkable that the Mesolithic cranial finds of the Iron Gate show similarity to the early Neolithic skulls of the Karanovo horizon, while its connections with the local Lepenski Vir culture seem somehow looser. The heterogeneous structure of the Lepenski Vir culture does not manifest similarity to the finds of either Karanovo horizon or the MELP, and has only a significant connection to the locally ensuing Starcevo crania, which show an extremely strong inner cohesion.

Thus we can suppose that in the Iron Gate region the Mesolithic-early Neolithic period may have experienced a process influenced by southern genetic impulses in which the local genetic pool may have been broken by a slight exogamous period, at the time of the Lepenski Vir culture.

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*Mailing address:* Dr. Szathmáry László  
KLTE Humánbiológia  
H-4010 Debrecen, Hungary

