

AN ANTHROPOLOGICAL STUDY OF LIVING HUNGARIANS

Andor Thoma and Gyula Henkey

Paris – Kecskemét

Abstract: *From 1956 to 1997, 28 884 Hungarians between 24 and 60 years were examined, with classical anthropological methods, by Gyula Henkey. 9 body measurements and 6 descriptive characters were taken. The average stature of men is 170 cm. Women are 12 cm smaller. Head and face are wide, the hair is dark. Stature and discontinuous characters are variable, otherwise the whole population is relatively homogeneous. Seven male territorial samples (Fig. 2) were analysed and compared. A striking resemblance appeared between western (Rábaköz, R) and eastern (Székely, Sz) border-guard descendants. Inertial analysis, applied to five qualitative discontinuous characters, separates a loose central group and a more homogeneous peripheral one. Comparison between Hungarians and other populations does not indicate any anthropological affinity.*

Keywords: *Hungarians; Anthropometry; Anthroposcopy; Multivariate analysis.*

Introduction

The present-day Hungarian is defined by his mother-tongue and self-identification and not by his passport. The population of Hungary is 10 million, but, as a consequence of the peace-treaty of Trianon (1920) about 3 millions Hungarians live now in neighbouring states. The present inquiry extends to 28 884 adult Hungarians of both sexes; among them 2 042 are inhabitants of southern Slovakia and 571 of Roumania (Transylvania).

The whole field-work was done by Henkey, from 1956 to 1997 (Henkey 1998). Men and women from 24 to 60 years were measured. Martin's (1928) techniques were used throughout. The autochthonous population was identified on the basis of the 1828 census and old parish registers. Means and variances were calculated on computer.

Anthropometry

Table 1 characterizes the whole Hungarian population sample. The average male stature is 170 cm (range of means: 168–175). Women are 12 cm smaller. In the course of the 42 years of investigations, the average male stature became several cm greater. Cephalic index is unchanged: 85 in males, 86 in females. In Table 2, estimated Hungarian (s) and "mean intraracial" standard deviations (σ) of Tildesley (1950) are compared. Stature displays the greatest variation, obviously in consequence of diachronic changes. Nasal breadth is the most stable character, what may be a consequence of its dependence on climate (cf. Weiner 1954). The mean sigma ratio of the seven other measurements is 98.28. It is small for a nation-wide sampling.

Table 1. Metrical characters of Hungarians. Measurements of Henkey.

N	Males			N	Females	
	M	s			M	s
14 212	170.00	6.52	Stature	14 572	157.87	5.97
14 282	188.22	6.02	Head length	14 601	179.32	5.43
14 282	160.32	5.42	Head breadth	14 602	154.02	4.93
14 282	113.35	4.44	Min. frontal breadth	14 601	109.93	4.02
14 279	146.30	5.58	Bizygomatic breadth	14 599	139.32	5.12
14 277	121.28	6.28	Morph. face height	14 599	111.39	5.56
14 280	112.97	5.70	Bigonial breadth	14 601	105.89	4.95
14 263	53.69	3.44	Nasal height	14 587	49.78	3.00
14 264	36.00	2.39	Nasal breadth	14 588	32.78	2.02
14 282	85.22	3.26	Cephalic index	14 601	85.95	3.09
14 274	82.93	4.70	Facial index	14 596	80.01	4.31
14 262	67.28	6.22	Nasal index	14 587	66.07	5.68

Table 2. Comparison of estimated Hungarian (s) and world average (σ) standard deviations.

Measurement	s	σ	100 s/ σ
Stature (v - pl)	6.52	5.89	110.69
Head length (g - op)	6.02	6.32	95.25
Head breadth (eu - eu)	5.42	5.21	104.03
Min. frontal breadth (ft - ft)	4.44	4.77	93.08
Bizygomatic breadth (zy - zy)	5.58	5.23	106.69
Morph. face height (n - gn)	6.28	6.42	97.82
Bigonial breadth (go - go)	5.70	5.64	101.06
Nasal height (n - sn)	3.44	3.82	90.05
Nasal breadth (al - al)	2.39	2.87	83.28

In Table 3, μ is the "interracial mean" and σ_g is the "interracial S. D." of Tildesley (1950); M is the Hungarian mean and $\bar{z} = (M - \mu) / \sigma_g$. Seven z-values are positive and the average of the eight measurements (\bar{z}) is positive, too. These figures indicate, that the Hungarian is a big-headed man (cf. Kelemen 1968). Nose-breadth only has a negative z-value (the nose is narrow), what is quite normal under temperate climate. Values of $(z - \bar{z})$ express the shape: the head and face of the Hungarian are relatively broad, but the head is rather short and the face is low. The nose is relatively small. Figure 1 helps imagination.

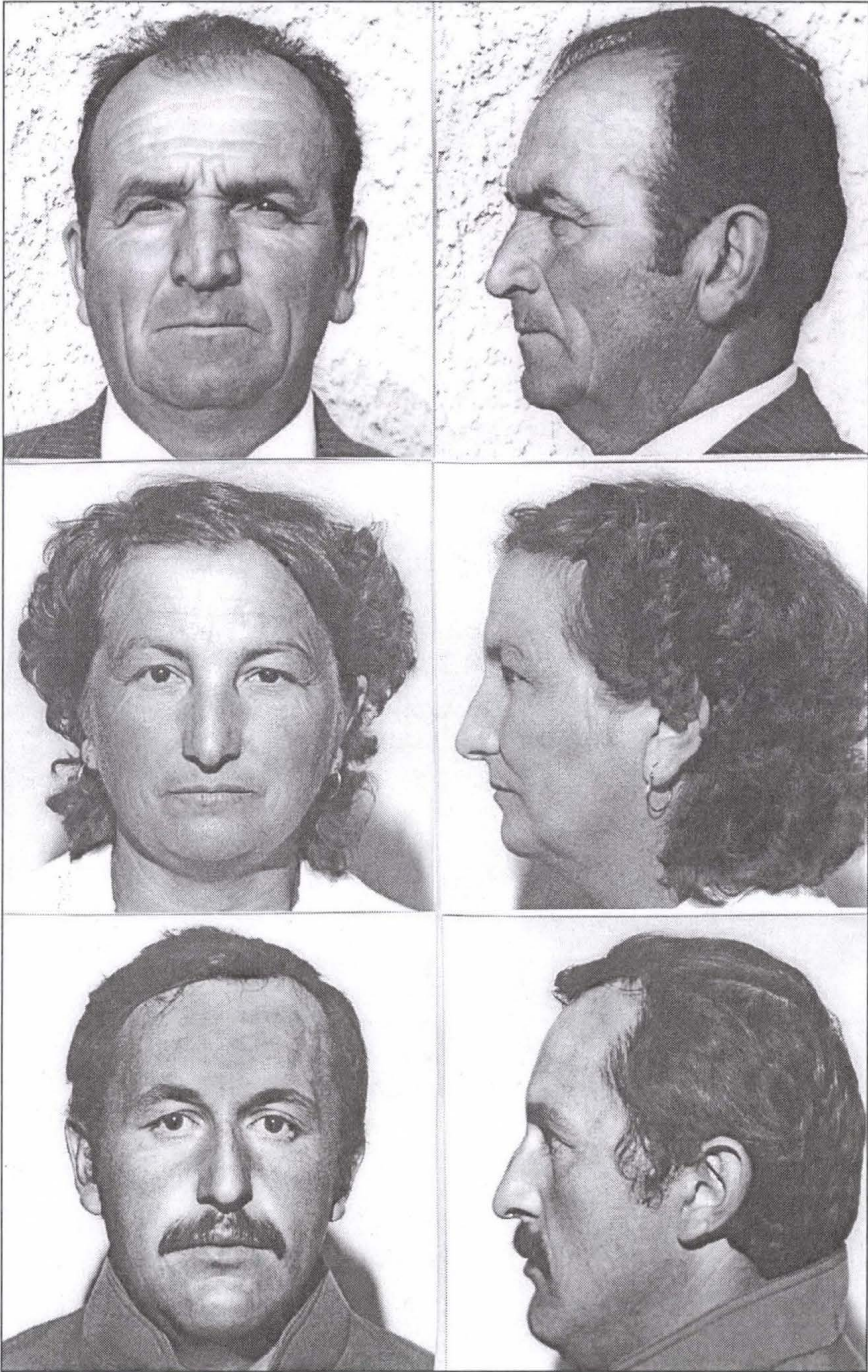


Figure 1. Hungarian heads.

Table 3. World means (μ), intergroup standard deviations (σ_g), Hungarian means (M), standardized differences between means (z) and recentred standardized differences ($z - \bar{z}$).

Males	μ	σ_g	M	z	$z - \bar{z}$
g - op	187.9	4.90	188.2	0.061	-0.796
eu - eu	150.4	5.47	160.3	1.810	0.953
ft - ft	106.8	3.68	113.35	1.780	0.923
zy - zy	139.2	4.55	146.3	1.560	0.703
n - gn	120.5	4.91	121.3	0.163	-0.694
go - go	106.8	3.67	113.0	1.689	0.832
n - sn	53.4	3.37	53.7	0.089	-0.768
al - al	37.1	3.71	36.0	<u>-0.296</u>	-1.153
				$\bar{z} = 0.857$	

In Table 4 we will analyse seven territorial (see Fig. 2) male samples, by means of a similar method. The base of comparison is, however, the mean (M) and standard deviation (s) of the total Hungarian sample. The total number of men in the territorial samples is $N = 3\,546$.

Csallóköz (Cs) lies in the actual Slovakia. In the 16th and 17th centuries, the central parts of Hungary were occupied by the Ottoman Empire, but Turkish troops never reached the Csallóköz. The population is, therefore, continuous since the Middle Ages. Figures in Table 4 show that the head size (\bar{z}) is big, probably in correlation with the high stature. Bigonial breadth is relatively wide and nasal height is small.

Rábaköz (R) is a territory of medieval frontier guards. The population is continuous here. The only metric distinction is the relatively broad forehead.

Somogy (S) displays little difference from the national mean.

Palóc center (P) corresponds to an archaic dialectal group of Hungarian, who preserved a short illabial *á* (Bakó 1989). Anthropometric differences from the national mean are minimal.

Kiskun (K) group. The nomadic Cumans obtained a place of refuge from the King of Hungary, in 1239. They lost their Turkic language already in the Middle Ages, but they remained together until our days. Their head-shape is particular, relatively long with narrow forehead. Their high nose is unique in Hungary.

Nagykun (N) territory. The name indicates some relation with Cumans. The anthropological peculiarity of the population is its nearness to national averages.

Székely (Sz) border-guards live in SE Transylvania (now in Roumania) since the 12th century. Prior to that time they defended the western frontiers of Hungary. They are still Hungarian-speaking. Their head is somewhat longer and narrower than in central Hungary; correlatively the face is narrower, too. It seems that laticranisation is less advanced here than in the Hungarian Plain.

The metrical differences among Hungarian territorial samples are small. Samples S, P and N demonstrate that the Hungarian national mean is no abstraction: a mass of men is close to it.

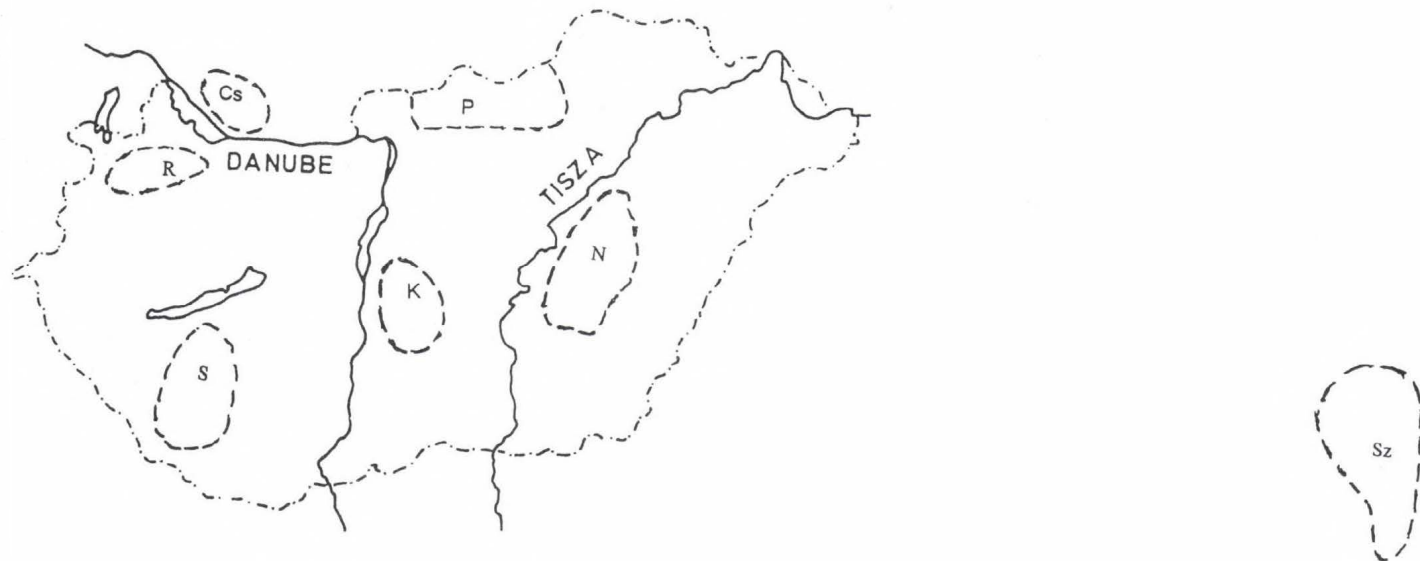


Fig. 2: Territorial samples.

Cs: Csallóköz, R: Rábaköz, S: Somogy, P: Palóc center, K: Kiskun group, N: Nagykun group, Sz: Székely people.

Table 4. Metrical data of territorial samples (males). The years of investigation are indicated. M: sample mean, s^2 : sample variance, z: standardized deviate from the total Hungarian sample.

	M	s^2	z	$z - \bar{z}$
Strong values of ($z - \bar{z}$) are marked *.				
<i>Csallóköz (Cs) 1994–1996</i>				
<i>N = 337</i>				
g - op	190.15	32.20	0.321	0.115
eu - eu	161.64	33.32	0.225	0.019
ft - ft	114.82	16.65	0.331	0.125
zy - zy	147.33	29.44	0.185	-0.021
n - gn	122.03	29.20	0.119	-0.087
go - go	115.75	29.69	0.488	0.282*
n - sn	52.99	8.45	-0.203	-0.409*
al - al	36.44	3.86	<u>-0.184</u>	-0.022
v - pl	175.11	44.18	$\bar{z} = 0.206$	-0.022
<i>Rábaköz (R) 1989–1993</i>				
<i>N = 559</i>				
g - op	188.09	32.85	-0.022	0.028
eu - eu	159.82	29.43	-0.092	-0.098
ft - ft	114.70	16.95	0.304	0.298*
zy - zy	145.02	26.25	-0.229	-0.035
n - gn	121.38	35.02	0.016	0.010
go - go	113.50	25.48	0.093	0.087
n - sn	53.30	10.11	-0.113	-0.119
al - al	36.21	3.94	<u>0.088</u>	0.082
v - pl	172.92	42.13	$\bar{z} = 0.006$	
<i>Somogy (S) 1985–1991</i>				
<i>N = 345</i>				
g - op	188.77	40.84	0.091	0.026
eu - eu	160.47	30.34	0.028	-0.037
ft - ft	114.61	20.91	0.284	0.219
zy - zy	146.76	36.06	0.082	0.017
n - gn	120.87	36.16	-0.065	-0.130
go - go	113.92	30.01	0.167	0.102
n - sn	53.06	10.03	-0.183	-0.248
al - al	36.27	4.74	<u>0.113</u>	0.048
v - pl	171.65	43.29	$\bar{z} = 0.065$	
<i>Palóc (P) 1972–1979</i>				
<i>N = 946</i>				
g - op	187.22	32.73	-0.166	-0.190
eu - eu	161.49	30.52	0.216	0.192
ft - ft	113.66	20.11	0.070	0.046
zy - zy	147.23	30.62	0.167	0.143
n - gn	121.44	39.54	0.025	0.001
go - go	113.16	30.09	0.033	0.009
n - sn	53.41	11.20	-0.081	-0.105
al - al	35.82	6.21	<u>-0.075</u>	-0.099
v - pl	169.97	33.46	$\bar{z} = 0.024$	

Table 4. cont'd.

	M	s ²	z	$\bar{z} - \bar{z}$
<i>Kiskun (K) 1958-1980</i>				
<i>N = 557</i>				
g - op	189.28	38.40	0.176	0.2745*
eu - eu	159.54	29.03	-0.144	-0.0455
ft - ft	111.70	20.47	-0.349	-0.2505*
zy - zy	146.42	32.76	0.022	0.1205
n - gn	121.45	42.68	0.027	0.1255
go - go	112.27	33.90	-0.123	-0.0245
n - sn	54.53	12.69	0.244	0.3425*
al - al	35.59	7.23	<u>-0.172</u>	-0.0735
v - pl	167.96	37.89	$\bar{z} = 0.0985$	
<i>Nagykun (N) 1972-1982</i>				
<i>N = 540</i>				
g - op	188.75	34.09	0.088	0.069
eu - eu	160.83	31.05	0.094	0.075
ft - ft	113.85	18.99	0.113	0.094
zy - zy	146.61	33.26	0.056	0.037
n - gn	120.71	44.47	-0.091	-0.110
go - go	112.37	31.73	-0.105	-0.124
n - sn	53.70	12.56	0.003	-0.016
al - al	35.98	6.19	<u>-0.008</u>	-0.027
v - pl	168.89	40.37	$\bar{z} = 0.019$	
<i>Székely (Sz) 1994</i>				
<i>N = 292</i>				
g - op	189.85	32.51	0.271	0.322*
eu - eu	158.13	32.73	-0.404	-0.353*
ft - ft	113.31	14.87	-0.009	0.042
zy - zy	144.23	32.45	-0.371	-0.320*
n - gn	121.99	38.29	0.113	0.164
go - go	113.32	25.05	0.061	0.112
n - sn	53.01	9.41	-0.198	-0.147
al - al	36.31	3.75	<u>0.129</u>	0.180
v - pl	172.17	42.30	$\bar{z} = -0.051$	

The anthropological position of the Székely may be defined more precisely by means of the shape distance of Penrose (1954):

$$C_z^2 = \frac{\sum d^2 - (\sum d)^2 / k}{k - 1},$$

where d is the difference between sample averages (standardized by means of σ_g ; see Table 3) and k is the number of characters. In the present case $k = 8$. Shape distances among Hungarian territorial samples were computed. Two Roumanian samples,

originating from the SE Carpathians, Nereju (N=98) and Negrilesti (N=67) (Vlădescu and Popescu 1998) were compared, too.

In Table 5, the Rábaköz (R) sample is about half as distant in shape from the Székely (Sz) as the other Hungarian samples, what is in accordance with western origin of the Székely. C_z^2 between the Székely and the two Roumanian samples is very large, in spite of their geographical proximity. Between these extremes, there is a monotony of small (<0.2) distances.

Table 5. Shape distances on the basis of eight head measurements.

Comparison	C_z^2
Székely (Sz) – Rábaköz (R)	0.056
Székely (Sz) – Csallóköz (Cs)	0.100
Székely (Sz) – Nagykun (N)	0.105
Székely (Sz) – Somogy (S)	0.111
Székely (Sz) – Kiskun (K)	0.120
Székely (Sz) – Palóc (P)	0.157
Székely (Sz) – Nereju (Roum.)	0.715
Székely (Sz) – Negrilesti (Roum.)	0.731

Anthroposcopy

In Table 6 the following character states display maximum frequencies: frontally flattened malar region, straight forehead, straight nasal profile (though gently curved noses are not uncommon), rounded occiput, dark eyes and dark hair. Dark eye-colour is defined histologically: the anterior limiting layer of the iris is continuously pigmented. The average frequency of the first five characters is 62% in the total male sample. They will be used for multivariate analysis.

On the basis of data in Table 7, Pierre Darlu performed, on computer, an "inertial analysis" (or analysis of correspondences; cf. Lefebvre 1980) devised for discontinuous characters. The underlying program was written by Edmond Iagolnitzer, in 1985. This type of analysis has a great advantage: populations and characters can be placed accurately in the same diagram.

Results are shown by Figure 3. The first two axes (factors) represent together 87.2% of the total variance. Two groups can be distinguished in the diagram. Four territorial samples (S, R, Sz, Cs) form a group at the right hand. In this group the malar region is more frontalized, the forehead is more frequently straight and there are more convex noses than straight ones. In the left hand group (P, N and K) the malar region is less frontalized, straight foreheads are less frequent and straight noses are more frequent. This group divides in two, onto axis 2: with the Kiskun (K) there are more flat occipital profiles than with N and P. Differentiation is essentially morphological, eye colour plays little role.

To sum up, two anthroposcopic groups are present among Hungarians, a central group and a peripheral one.

Table 6. Anthroposcopy of Hungarians.

Character		Males		Females	
		n	%	n	%
Malar region	frontally flattened	9 501	66.6	10 091	69.2
	rounded	3 659	25.7	3 872	26.5
	V-shaped	1 098	7.7	627	4.3
Forehead profile	rounded	74	0.5	584	4.0
	straight	12 553	88.0	13 720	94.2
	sloping	1 642	11.5	260	1.8
Nasal profile	concave	1 526	10.7	3 271	22.4
	straight	6 589	46.1	7 360	50.4
	convex	6 167	43.2	3 966	27.2
Occipital profile	bulging	1 828	12.8	2 756	18.9
	rounded	9 629	67.4	11 563	79.2
	flat	2 821	19.8	279	1.9
Eye colour (Martin-Schultz standards)	light (1a - 4a)	3 647	25.5	2 840	19.5
	mixed (4b - 8,10)	4 408	30.9	4 487	30.7
	dark (9,11 - 16)	6 207	43.5	7 264	49.8
Hair colour (Fischer-Saller standards)	blond (A - O)	290	2.0	406	2.8
	dark (P - Y)	13 950	97.7	14 151	96.9
	red (I - VI)	40	0.3	43	0.3

Table 7. Descriptive qualitative characters in territorial samples.

Sample		Cs	R	S	P	K	N	Sz
Total (males)		337	529	345	946	557	540	292
Malar region frontally flattened	n	279	390	252	632	364	352	208
	%	82.8	73.7	73.0	66.8	65.5	65.2	71.2
Forehead profile straight	n	322	506	323	825	430	455	283
	%	95.5	95.7	93.6	87.2	77.2	84.3	96.9
Nasal profile straight	n	134	173	120	533	287	244	105
	%	39.8	32.7	34.8	56.3	51.5	45.2	36.0
Occipital profile rounded	n	207	338	241	715	310	385	173
	%	61.4	63.9	69.9	75.6	55.7	71.3	59.2
Eye colour dark	n	156	246	177	404	277	279	141
	%	46.3	43.5	51.3	42.7	49.7	51.7	48.3

Cs: Csallóköz, R: Rábaköz, S: Somogy, P: Palóc center, K: Kiskun group, N: Nagykun group, Sz: Székely people.

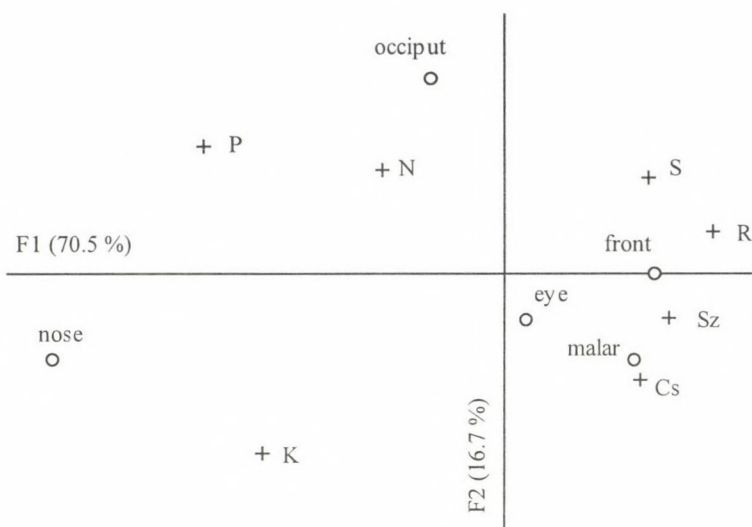


Fig. 3: Inertial analysis performed on the basis of data in Table 7. Crosses indicate territorial samples, circlets indicate characters.

Discussion

Reasons for the presence of a central group may be the settlement of Cumans in the 13th century, and Ottoman advance in the 16th and 17th centuries, in central Hungary. In the 18th there was a Palóc migration to the South.

Identity of the peripheral group may be clarified by comparison of the Székely (Sz) and Rábaköz (R) samples. In Figure 3 both Sz and R are close to axis 1. Among the shape distances of the Székely (Table 5), the distance to R is the smallest, in spite of their isolation for 900 years at least. Ethnographical and dialectal peculiarities and medieval clan names are the same in Western Hungary and among the Székely. Both Sz and R belonged to the same border-guard population. In the 11th century the danger came from the West (The German Emperor); in the 12th, Hungary was under the threat of eastern nomadic peoples. For this reason, a part of the frontal guards was transferred from the western border to Transylvania.

In Figure 3, Somogy (S) and Csallóköz (CS) stand near the border-guards. Hence the conclusion is inevitable: the whole peripheral group represents the medieval Hungarian folk-stock. Since that time, a laticranisation process took place in Hungary, but the stature remained the same (± 168 cm; Éry 1998) until the 17th century. It was still similar at the mid-20th.

Comparison

For the head-and-eye diagram (Figure 4) shape distances (with eight head measurements) were calculated on the basis of the following male samples:

- Slovakia (Prokopec 1967), N = 392
- Muntenia, Roumania (Schmidt 1991), N = 3 495
- Banat, Roumania (Schmidt 1991), N = 875
- Chanti (Ostyak) (Debetz 1947), N = 128
- Uzbek (Debetz, after Bernhard 1991), N = 591
- Tajik (Debetz, after Bernhard 1991), N = 519
- Kazakh (Ismagoulov 1982), N = 3 080
- Avars of the Caucasus (Akimova 1960) N = 790.

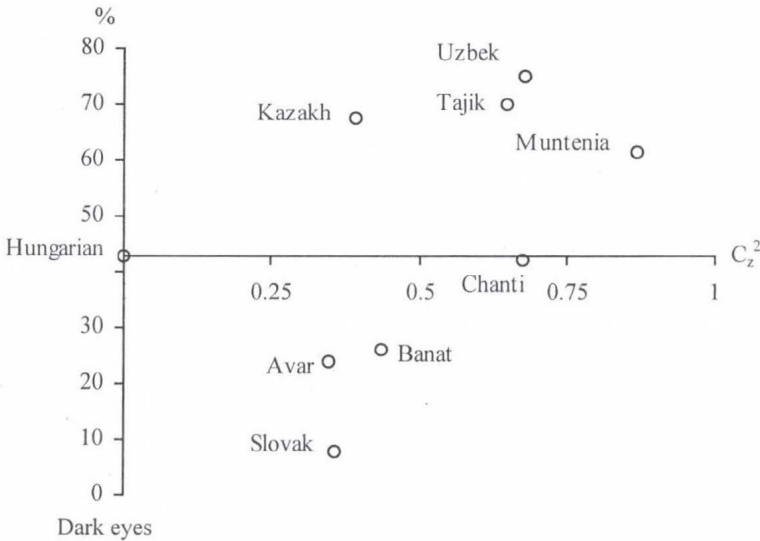


Fig. 4: Head-and-eye diagram.

Hungarians are sufficiently homogeneous for representing them by the means (M) of the total male sample. The compared series were selected on the basis of geographic vicinity (Slovakia, Roumania), linguistic relatedness (Chanti of Western Siberia) and hypothetical affinities. Soviet Anthropologists measured morphological face height and nasal height from the lower margin of eyebrows, what is on the average 4.3 mm above the nasion (Mark 1970). With Kazakhs the difference is 6.2 mm (Ismagoulov 1982). An adequate correction was applied in the present paper. As regards dark eyes, the definition of Bunak (Mark 1970), generally used by Soviet authors, is identical with ours.

The results (Figure 4) do not indicate anthropological affinities.

Between Hungarians and 290 Savoyards (Billy 1962) $C_z^2 = 0.711$, what excludes the Alpine character of Hungarians.

Conclusion

There are two levels of variation among Hungarians. Characters with continuous distribution are relatively homogeneous: head and face are wide, the hair is dark. Qualitative discontinuous characters indicate a loose central group and a rather uniform peripheral one.

An unexpected result is the causal relation between historical events and anthropological phenomena (emergence of a central group and western affinities of the Székely).

Összefoglalás:

Thoma Andor és Henkey Gyula: Az élő magyarság embertani jellemzése

1956 és 1997 között Henkey Gyula 28 884 felnőtt (24–60 éves) magyar férfit és nőt vizsgált meg. Kilenc testméret és hat leíró jelleg került felvételre. Az itt következő elemzés tehát egyetlen vizsgáló adataira épül.

A férfiak átlagos testmagassága 170 cm; a nők 12 cm-el alacsonyabbak. A fej és az arc széles, az orr viszonylag kicsiny, a hajszín sötét. A szemszín, a járomtáj valamint a nyakszirt-, homlok- és orrprofil nem egységesek. Hét területi minta (N = 3 546 férfi): Csallóköz, Rábaköz, Somogy, Palócföld, Kiskunság, Nagyunság és a Székelység nyolc fejméret alapján csak kevéssé tér el egymástól. Feltűnő a Székelység és a rábaközi nép hasonlósága. Ezzel szemben a székely minta és közeli román falvak lakossága között nagy formabeli távolság mutatkozik.

A leíró jellegek csoportosulását a megfelelések elemzésével vizsgáltuk. Ilyen módon két csoport volt elkülöníthető: *a központ* (Palócok, Kis és Nagyunság) és *a peremvidék* (Csallóköz, Rábaköz, Somogy és a Székelyföld) lakossága. A laza központi csoport a kunok középkori betelepülésével, a török hódoltsággal és a 18. századi palóc kirajzással hozható kapcsolatba. Több érv szól amellett, hogy a peremvidék morfológiailag egységesebb népe a központnál jobban megőrizte a középkori magyarság embertani alkatát.

Kísérletet tettünk a magyarság biometriai összehasonlítására a szomszédos, továbbá a kaukázusi, Közép-ázsiai és Nyugat-szibériai népekkel. Meggyőző hasonlóság sehol sem mutatkozott.

Taxonómiai elemzés Henkey (1998) munkájában található.

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References

- Akimova, M. S. (1960) Anthropological Type of the Lezghians. In: *Contributions to the Physical Anthropology of the Soviet Union*. Peabody Museum, Cambridge, Mass. pp. 107–122.
- Bakó, F. (Ed. 1989) *Palócok*. I. Muzeumok, Eger, 443 p.
- Bernhard, W. (1991) *Ethnische Anthropologie von Afghanistan, Pakistan und Kashmir*. Fischer, Stuttgart, 282 p.
- Billy, G. (1962) La Savoie: Anthropologie physique et raciale. *Bull. Mém. Soc. Anthropol. Paris*, 3, XI. série, 1–218.
- Debetz, G. F. (1947) Selkupy. *Troudy Instituta Etnografii*, n.s. 2: 11–87.
- Éry, K. (1998) Length of Limb Bones and Stature in Ancient populations in the Carpathian Basin. *Humanbiologia Budapestiensis*, 26, 11–87.
- Henkey, Gy. (1998) Ethnical Anthropology of Living Hungarians. *Cumania*, 15; 403–466.
- Ismagoulov, O. (1982) *Ethnical Anthropology of Kazakhstan*. Nauka, Alma Ata, 402 p.
- Kelemen, A. (1968) Dömsöd: the Anthropological Position of a centrally situated Borough. *Anthropologiai Közlemények*, 12; 125–160.
- Lefebvre, J. (1980) *Introduction aux analyses statistiques multidimensionnelles*. Masson, Paris, 259 p.
- Mark, K. (1970) *Zur Herkunft der Finnisch-Ugrischen Völker vom Standpunkt der Anthropologie*. Eesti Raamat, Tallin, 129 p.
- Martin, R. (1928) *Lehrbuch der Anthropologie*. Bd I. Fisher, Jena, 509 p.
- Penrose, L. S. (1954) Distance, Size and Shape. *Ann. Eug.*, 18; 337–343.
- Prokopec, M. (1967) A Contribution to the Anthropology of Slovakia. *Anthropologia*, V./3; 51–58.
- Schmidt, H. D. (1991) The anthropological Structure of the Populations of South and Southwest Romania. *Glasnik ADJ.*, 28; 15–25.
- Tildesley, M. L. (1950) The relative Usefulness of various Characters on the Living for Racial Comparison. *Man*, 50; 14–17.
- Vlădescu, M., Popescu, I. (1998) Secular Trend Phenomena in some Roumanian Populations. *Anthropologiai Közlemények*, 39; 33–42.
- Weiner, J. S. (1954) Nose Shape and Climate. *Amer. J. Phys. Anthropol.*, 12; 615–618.

Mailing address: Thoma Andor
1, Rue Poliveau
F-75005 Paris
France

Henkey Gyula
H-6000 Kecskemét,
Kossuth tér 6–7.
Hungary

