

## SECULAR TREND PHENOMENA IN SOME ROUMANIAN POPULATIONS

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*Abstract: Important diachronical changes can be observed in Roumanian populations.*

*Our present study is focused on two population patterns we considered representative for the secular trend dynamic in Roumania: Vrancea county, located in the Southeast Carpathian Mountains; and Apuseni Mountains region, placed in the western part of Roumania. Our analysis is based on 20-25 cephalic, facial, nasal and corporal characters including dimensions and indices. Data are comparable for the two areas as for the two studied periods. We present anthropological data about 1256 males, out of which 727 examined in the first stage of the research (around 1940—1950) and 529 in the second stage (around 1970—1980).*

*The population of Apuseni Mountains region conserved its anthropological typology, but the present-day Alpine types no longer correspond to the classic description. In Vrancea county populations' the typology changed. The Mediterranean forms diminished leaving place to the Dinaric and Alpine elements.*

*Our study does not demonstrate the stated positive correlation of the stature with the anterior-posterior diameter of the brain pan, or the negative correlation with the cephalic index. Males height increased, but also did the cephalic index (intensified brachycephaly). The dimension that obviously grew was the transversal brain pan diameter, not the anterior-posterior one. Our data show that, whatever the initial degree of brachycephaly, the rounding process of the callote continued. Still, we found one exception, which allows us to affirm that the general debrachycephalisation process started in our populations too. Present-day males sample from Ocolis (Apuseni Mountains) display a 1 i.u. diminution of the cephalic index.*

*Correlation between stature and cephalic index also reveals that where the tendency to debrachycephalisation appears, height increases only with 1cm. However, stature grew with 3 cm in the populations where the rounding of the brain pan continued.*

*Keywords: Secular trend; Cephalic, facial, nasal and corporal characters; Debrachycephalisation; Height.*

### Introduction

Microevolutionary phenomena have been a major research theme for Roumanian anthropologists, as for other researchers around the world.

In 1990 we finished data collection, at national level, in order to elaborate an Anthropological Atlas of Roumania. With this occasion, our researches resumed to some of those populations investigated over half a century ago. The time interval (at least 25 years) and other conditions required for a study on the diachronic anthropological modifications were also fulfilled.

Necrasov first conducted such studies concerning dimensional and conformational phenotypic changes in Roumanian populations, in collaboration with anthropologists from Bucharest and Iasi. (Necrasov et al. 1967, Necrasov and Cristescu 1969). The next decades other researches were published. We will quote only another three. The first

analyses two generations of students from the Bucharest Medicine Faculty (Enăchescu et al. 1973). The second investigates the evolution of the population from a little community (300 habitants). The study was carried out on exhaustive basis, on families, in the succession of three generations (grandparents, parents and children) separated by a 25 years period. (Popovici-Bădărău and Vlădescu 1981). The third investigates the evolution of the cephalic index in Roumanian populations, beginning with the Feudalism (Vlădescu 1992).

Our present study is focused on two population patterns we considered representative for the microevolution dynamic in Roumania, and not only.

Some of the anthropological data we used, was published before (Vlădescu 1988, 1989); other data are original and over half a century old. I. Făcăoaru, an anthropologist from Cluj, collected it in 1939. We employ them with the author's permission, granted while he was still alive.

We will analyse further the secular trend phenomena in male populations out of eight villages located in submountain areas. Four of these communities are situated in the Southeast part of the Roumanian Carpathian Mountains, a zone named by ethnographers Vrancea county (Nereju, Negresti, Bârsesti, and Tulnici). The other four are situated in the underhill zone of the Apuseni Mountains, on the valley of Aries River (Posaga, Lunca, Ocolis, and Sălciua). Both these areas are rather isolated, not only geographically but also from a social and cultural point of view (Figure 1). The demographically closing was calculated for a part of these populations, in the interval 1900 – 1980. (Geană 1980). Although the endogamy indices' mean values are not very high, the local elements are dominants (84.35% at Negrilesti, 70.8% at Bârsesti, 73.4% at Câmpuri). The exchange of genetic material by matrimonial traditions it is reduced to a limited mating area, concerning the nearby communities – which are also investigated in our work.

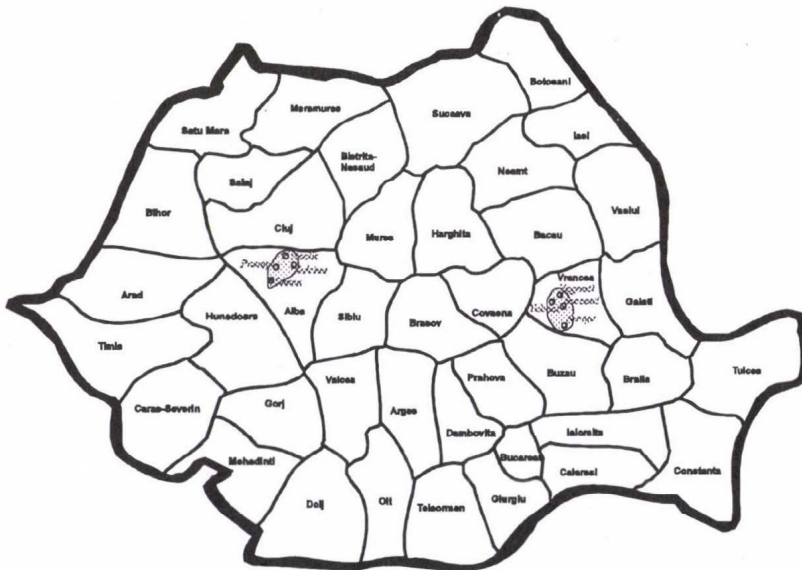


Fig. 1: Location of the Studied Regions on Roumania's Map



## Material and Method

We present here anthropological data about 1256 males, out of which 727 examined in the first stage of the research (around 1940—1950) and 529 in the second stage (around 1970—1980).

The present-day sample, investigated personally, includes only adult subjects aged 20 to 50. They represent the native adult generation, not affected by degrading processes (due to age), which succeeded the one studied three decades ago. The age limits were chosen to eliminate the risk that one subject would be included in a previous survey. Where we had possibility we used genealogies. These precautions consent to the accurate methodology for secular trend analyses (Necrasov 1968).

Our analysis is based on 16 cephalic, facial and nasal characters, and 3-8 body features, including dimensions and indices. Data are comparable for the two areas as for the two studied periods. For the Apuseni Mountains zone, few more anthropological features illustrate the body constitution.

Data collection and interpretation relied on the classical methodology recommended by German (Martin and Saller 1956) and French authors (Olivier 1960). Rigorous precautions were taken in order to avoid any errors that could appear due to disagreements between different authors.

To accomplish a characterisation of the samples we have calculated averages for each anthropological feature. The mean values are presented in tables, concurrently with the authors and periods the data were collected. The data are also represented as graphics — taxonomic morphograms (Grintescu-Pop et al. 1965). Such method was chosen to picture the values of standard classification scales in order to get a clearer image of the anthropological aspects that distinguish our samples, and their evolution.

## Results and discussions

*Secular trend phenomena in Vrancea county populations.* Detailed analysis of our up-to-date data shows that equivalent mean values for each community are very close. (Table 1). The male population in this area is characterised by a high degree of anthropological homogeneity. Many features present only a tenth of a millimetre difference between communities; others are just the same, as for the anterior-posterior diameter of the callote, at Nereju and Negrilesti, or the length of the nose at Tulnici and Bârsesti. Dissimilarities of 1-2 mm can be seen only for the cephalic height, minimum frontal diameter, and nose breadth.

Considering the similar genetic background we have calculated synthetically averages for each studied period. For a better understanding of our results we represented this averages also as taxonomic morphograms (Figure 2).

Males from Vrancea Mountains presented in the period 1984—1987 the following attributes: 1. Medium length cephalic callote with a concomitant tendency to a wide and high form; 2. A wide face at cheekbone level, medium wide at jaw level and obviously high; 3. Rather high and medium wide nose, with tendency to frequent narrow forms.

In these populations, the head shape shows: 1. Intense brachycephaly until incipient hyperbrachycephaly; 2. Metriocephaly, what concerns cephalic height as compared to breadth and hypsicephaly as compared to length; 3. Leptoprosope face (an increased facial index) and mesorhine type of nose; 4. Wide front as compared to cephalic breadth, and middle as compared to cheekbone and jaw breadth.

Table 1: Diachronic changes concerning male anthropometrical features in four villages from Vrancea county

Measurements	NEREJU							TULNICI						
	Rainer 1927			Vlădescu 1987				Necrasov 1956			Vlădescu 1984			
	N	Mean	SD	N	Mean	SD	t-test	N	Mean	SD	N	Mean	SD	t-test
g-op	134	185.7	7.40	98	184.5	6.66	1.27	100	187.7	5.73	62	183.9	5.19	0.86
eu-eu	134	151.1	5.80	98	156.6	5.43	7.45	100	152.6	5.40	62	156.8	5.10	5.32
t-v	134	125.3	6.60	98	128.1	4.61	3.89	100	126.6	5.31	62	126.2	4.08	0.50
ft-ft	133	102.1	4.50	98	109.9	4.32	13.38	100	108.2	4.26	62	108.9	3.63	1.34
zy-zy	132	139.6	5.10	98	142.1	4.50	4.03	100	140.2	5.22	62	142.2	4.08	2.65
go-go	133	105.7	5.90	98	111.7	5.07	8.29	100	109.3	5.55	62	111.4	4.48	2.66
n-gn	130	121.2	6.10	98	127.8	4.94	9.25	100	126.1	7.98	61	128.1	5.40	1.77
n-sn	131	53.2	3.70	98	56.6	3.49	4.86	100	56.9	4.36	62	56.7	3.42	0.45
al-al	131	34.3	2.90	98	34.9	2.55	1.75	100	36.4	2.60	62	35.1	2.76	3.07
eu-eu / g-op	134	81.5	4.29	98	84.9	4.04	6.07	100	83.3	3.81	62	85.5	3.18	4.06
t-v / g-op	134	66.8	3.72	98	69.5	2.85	6.48	100	68.7	3.08	62	68.8	2.54	0.18
t-v / eu-eu	134	83.0	4.24	98	81.9	3.72	2.08	100	82.8	3.84	62	79.6	3.06	6.00
ft-ft / eu-eu	133	67.9	3.27	98	70.2	2.81	5.50	100	70.9	3.10	62	69.6	2.60	2.87
ft-ft / zy-zy	132	73.7	2.78	98	77.3	2.40	10.26	100	76.9	3.30	62	77.7	2.68	1.48
go-go / zy-zy	132	75.9	3.62	98	78.6	2.90	6.21	-	-	-	62	-	-	-
n-gn / zy-zy	130	86.9	4.35	98	89.9	3.88	5.56	100	89.9	4.26	62	90.3	4.14	0.50
al-al / n-sn	131	65.2	7.70	98	62.0	6.02	3.53	100	64.2	6.69	62	62.8	6.51	1.35
v-sol	133	1668.0	58.40	98	1700.7	54.61	4.35	100	1664.0	56.70	62	1684.1	61.20	2.08
v-sitt	133	880.2	33.00	98	897.0	29.97	4.01	-	-	-	-	-	-	-
i. cormic	133	52.7	1.35	98	52.8	1.14	0.02	-	-	-	-	-	-	-

Measurements	BÂRSESTI							NEGRILESTI						
	Necrasov et al. 1957			Vlădescu 1987				Necrasov et al. 1958			Vlădescu 1987			
	N	Mean	SD	N	Mean	SD	t-test	N	Mean	SD	N	Mean	SD	t-test
g-op	100	185.2	6.10	60	184.8	5.91	0.41	100	183.7	5.70	67	184.5	5.60	0.96
eu-eu	100	151.7	4.80	60	157.5	4.59	7.44	100	153.2	5.10	67	156.4	3.90	4.61
t-v	100	126.7	4.90	60	127.1	4.68	0.46	100	127.3	4.86	67	128.9	2.94	1.82
ft-ft	100	107.6	4.30	60	111.1	4.14	5.36	100	107.7	4.05	67	110.9	4.05	5.17
zy-zy	100	139.7	5.00	60	142.5	4.77	3.50	100	139.9	4.77	67	141.6	4.74	2.33
go-go	100	108.6	5.20	60	111.0	5.22	2.90	100	109.3	4.45	67	110.8	4.98	1.12
n-gn	100	126.5	6.80	60	127.7	6.45	1.11	100	126.0	6.24	67	127.1	6.48	1.05
n-sn	100	57.0	4.00	60	56.9	3.42	0.07	100	56.9	4.02	67	56.2	3.18	1.21
al-al	100	36.0	2.90	60	33.7	2.70	5.48	100	35.5	2.35	67	34.0	2.36	3.92
eu-eu / g-op	100	81.9	5.00	60	84.9	2.92	4.92	100	83.5	3.72	67	84.9	3.64	2.70
t-v / g-op	100	68.7	3.30	60	68.7	2.80	0.02	100	69.4	3.02	67	69.4	2.45	0.07
t-v / eu-eu	100	83.6	3.30	60	79.3	2.42	9.80	100	83.2	3.52	67	82.1	2.82	2.33
ft-ft / eu-eu	100	71.0	2.60	60	70.9	2.44	0.20	100	70.2	2.86	67	70.8	2.90	1.29
ft-ft / zy-zy	100	77.0	3.00	60	77.9	3.14	1.94	100	77.2	3.24	67	78.3	2.74	2.39
go-go / zy-zy	-	-	-	-	-	-	-	-	-	-	67	-	-	-
n-gn / zy-zy	100	90.5	5.70	60	89.4	4.56	1.31	100	90.1	4.92	67	90.2	4.20	0.15
al-al / n-sn	100	63.2	6.80	60	59.6	5.94	2.61	100	62.5	6.18	67	61.1	5.31	1.58
v-sol	100	1667.7	62.60	60	1698.5	60.30	3.02	100	1663.4	55.50	67	1694.5	54.90	3.53
v-sitt	-	-	-	-	-	-	-	-	-	-	-	-	-	-
i. cormic	-	-	-	-	-	-	-	-	-	-	-	-	-	-



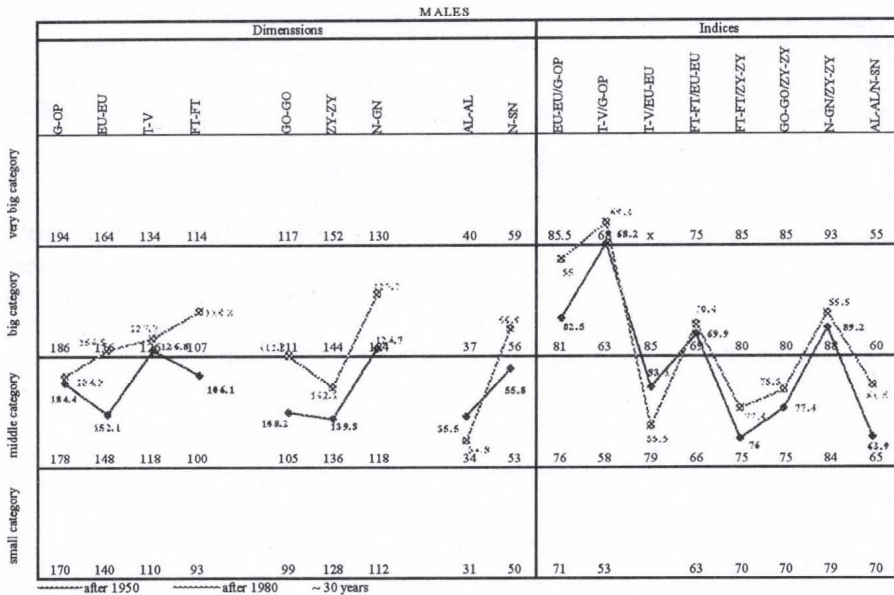


Fig. 2: Taxonomic Morphogram - Vrancea county

Stature is higher than medium in all villages varying from 168.4 cm at Tulnici to 170.1 cm at Nereju. Differences from middle value are significant, varying between 2 and 3.3 cm. We empathise that at Nereju the body shape (expressed by the cormic index) did not change in six decades, since stature and sitting height evolved proportionally in the same direction. Comparing the samples from Nereju in 1937 (Rainer 1937) Tulnici, Bârsesti and Negrilesti in 1964 (Necrasov et al 1964) with our up-to-date samples we can observe that all anthropological measurements present a tendency to higher values. Such trend appears for nine features in males from Nereju and seven characteristics in male from Bârsesti and Negrilesti. The value increase is not always significant. The population from Nereju shows greatest differences between the two studied periods; here only values of the anterior-posterior diameter of the callote and the breadth of the nose remained the same. This microevolutive phenomenon can be explained by the greater interval of time passed between the two data collection for this particular village.

Analysing the evolution of the concerned measurements, we emphasise that the horizontal dimensions (such as the transversal diameter of the callote, minimum frontal diameter, jaw breadth, and the face breath at cheekbone level) present greater variation. In the same time sagital dimensions, as the cephalic height or the length of the nose, have also increased.

However, the indices, as relative values do not evolve in a positive sense as frequent and as evident as the dimensional measurements. Fluctuations appear because of the different evolution and proportionality between the compared values.

The present-day populations show an augmentation of the brachycephaly, as can be seen in figure two. The increase varies from 1.4 i.u. at Negrilesti to 3.4 i.u. at Nereju. Growth was substantial for population samples that previous recorded a lower brachycephaly. We consider that this process was completed by two principal

mechanisms: 1. The concomitant but unproportional growth of the transversal and anterior-posterior diameters of the brain pan, as in the male population from Negrilesti; 2. The antagonistic evolution of this two features, with the lowering of the anterior-posterior diameter and the growing of the transversal diameter, as in the male populations from Nereju, Tulnici and Bârsesti.

Previous studies (Necrasov 1967) stated that populations from Vrancea county had an important Mediterranean and Dinaric typological structure. Especially the latest type shows greater sensitivity to diachronic changes. This leads to a higher frequency of hypsicephalic and metriocephalic types of the brain pan, as well as a leptoprosope face and meso- leptorhine nose. We observed that round and high type of callote show a stronger correlation (expressed by "r") between transversal diameter and height than the correlation between anterior-posterior diameter and height. (Pop et al. 1968)

We consider that the lateral significant development of the callote leded also to a higher frequency of Alpine elements. This evolution was indigenous, without an inflow of foreign genetic material since our samples were carefully selected. An important role played probably a differential fecundity associated with specific environmental conditions.

*Secular trend phenomena in Apuseni Mountains populations.* For this region, we dispose of a more complete group of anthropological data, eight out of twenty five features concerning the body constitution. New data concerning these samples were collected by us in the period 1986-1990. Out of the information from 1939 were processed and published the data about the anthropological structure of the populations from Sălciua (Vlădescu 1990).

*Cephalic and facial aspects.* No important differences appear between the microevolutive phenomena in the Apuseni Mountains area compared with the Vrancea county, as shown by the mean values presented in Table 2.

The present-day populations reveal a well-expressed tendency to higher dimensional quota. The microevolutive phenomenon displayed a linear growth. Therefore, if the first generation presented mean values varying within the limits of the middle category, the present-day samples show variations over the limits of big category (Figure 3).

We emphasise that on a basic homogenous taxonomic background (dominantly Alpine). Student test values vary from village to village. We observe that the signification of the "t" test is higher for brain pan and face features than for the nose characteristics.

Unlike the dimensions, present-day indices are most frequent lower than the previous generation ones.

The initial typological structure of these populations showed a strong tendency to hyperbrachycephaly. On this background, the callote dimensions increased both in length as in breadth. However, the anterior-posterior diameter presents a lower enlargement. This evolution determined three kinds of situations: 1. An important brachycephalisation continued in the populations from Sălciua and Lunca. 2. Cephalic index conserved same values in the population from Posaga. 3. The process of debrachycephalisation started in the population from Ocolis, where the cephalic index decreased with 1 i.u. What concerns this population, in given environmental conditions, the mean value of 88.6 i.u. represents probably the highest limit, genetically determined, of the cephalic index.



Table 2: Diachronic changes concerning male anthropometrical features in four villages from Apuseni Mountains region

Measurements	SĂLCIUA							POSAGA						
	Făcăoaru 1939			Vlădescu 1986			t-test	Făcăoaru 1939			Vlădescu 1986			t-test
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
g-op	117	181.8	5.89	79	183.2	6.53	1.72	87	180.6	5.70	77	184.1	5.43	4.02
eu-eu	117	156.5	6.18	79	160.9	5.93	5.09	87	156.2	5.936	77	160.4	5.01	4.94
t-v	117	121.5	5.95	79	124.6	4.79	4.01	86	123.4	5.61	77	125.7	4.05	3.07
ft-ft	117	107.5	4.70	79	109.6	4.63	3.18	87	107.1	4.71	77	111.4	3.94	6.32
zy-zy	117	140.7	5.22	79	144.3	5.79	4.43	87	141.1	6.14	77	145.7	5.13	5.23
go-go	117	108.9	6.85	79	110.8	6.27	1.99	87	108.2	6.92	76	112.3	4.83	4.61
n-gn	117	124.8	6.59	79	125.9	5.95	1.23	87	125.4	6.61	77	125.6	5.04	0.22
n-sn	117	56.6	4.10	79	55.9	3.36	1.16	87	56.3	3.99	77	56.5	3.22	0.27
al-al	117	34.6	2.39	79	34.9	2.77	0.77	87	34.4	2.39	77	34.6	2.70	0.41
eu-eu / g-op	117	86.2	4.07	79	87.9	3.88	3.16	87	86.9	3.51	77	86.9	3.28	-
t-v / g-op	117	66.8	2.99	79	68.0	2.66	2.93	85	68.5	2.96	77	68.3	2.28	0.49
t-v / eu-eu	117	77.7	3.83	79	77.5	3.29	0.47	86	78.6	3.60	77	77.9	2.93	1.37
ft-ft / eu-eu	117	68.7	3.05	79	68.1	2.60	1.50	87	68.4	2.85	77	69.6	2.52	2.86
ft-ft / zy-zy	117	76.4	3.12	79	76.1	3.25	0.83	87	75.9	2.93	77	76.7	2.90	1.74
go-go / zy-zy	117	77.5	4.32	79	76.8	3.67	1.07	87	76.7	4.18	77	77.5	3.04	1.70
n-gn / zy-zy	117	88.8	5.31	79	87.4	4.45	2.01	87	89.0	5.22	77	86.4	4.56	3.42
al-al / n-sn	117	61.5	6.06	79	62.6	6.06	1.28	87	61.4	6.35	77	61.8	6.09	0.41
v-sol	117	1671.6	59.57	79	1700.2	67.78	3.05	87	1675.3	68.87	76	1703.6	53.40	2.95
v-sitt	117	884.3	28.47	79	883.4	37.70	0.20	87	885.1	28.04	76	890.0	35.80	0.96
weight	117	63.2	6.69	79	70.1	12.78	4.41	87	62.2	6.69	72	71.0	10.35	6.33
a-a	117	392.2	17.15	79	380.5	20.10	4.21	87	393.2	17.86	76	386.5	22.95	2.06
thorax perimeter	117	915.1	43.49	79	952.2	75.22	3.86	87	917.6	50.49	76	963.1	70.20	4.69
i. cormic	117	52.9	1.18	79	51.9	1.40	4.75	87	52.3	1.68	76	51.8	1.22	5.00
i. Roehrer	117	1.37	0.13	79	1.43	0.28	2.68	87	1.34	0.15	76	1.44	0.22	2.78
a-a / v-sol	117	23.5	0.78	79	22.4	1.06	7.71	87	23.5	0.88	75	22.9	1.04	4.00

Measurements	OCOLIS					LUNCA								
	Făcăoaru 1939		Vlădescu 1988			Făcăoaru 1939		Vlădescu 1988						
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD		
g-op	49	178.3	5.32	52	183.6	5.52	4.91	43	180.9	6.45	34	183.4	4.16	2.07
eu-eu	49	157.9	5.67	52	160.7	4.79	2.72	43	157.1	7.55	34	161.2	4.02	3.06
t-v	49	122.2	6.21	52	125.4	4.28	3.02	43	124.2	6.32	34	124.9	4.93	0.55
ft-ft	49	110.1	5.35	52	109.1	3.99	0.93	43	109.1	4.24	34	108.4	3.26	0.82
zy-zy	49	142.5	5.08	52	144.7	5.94	2.02	43	141.4	6.13	34	145.4	4.83	3.20
go-go	49	104.9	8.40	52	111.8	5.70	4.82	43	107.7	6.37	34	111.9	4.43	3.41
n-gn	49	124.3	6.69	52	128.6	5.66	3.46	43	125.5	5.96	34	128.0	5.96	1.84
n-sn	49	55.9	3.13	52	58.5	3.59	3.88	43	56.5	4.00	34	57.7	3.48	1.41
al-al	49	34.6	2.03	52	35.6	2.77	2.27	43	34.7	2.81	34	35.1	2.58	0.65
eu-eu / g-op	49	88.6	3.57	52	87.6	3.28	1.47	43	86.9	3.96	34	87.9	2.75	0.51
t-v / g-op	49	68.6	3.86	52	68.4	2.66	0.30	43	68.7	3.09	34	68.1	2.64	0.91
t-v / eu-eu	49	77.5	3.99	52	78.1	2.55	0.90	43	79.2	3.99	34	77.6	3.53	1.86
ft-ft / eu-eu	49	69.7	2.82	52	67.9	2.75	3.27	43	69.6	3.19	34	67.3	2.20	3.71
ft-ft / zy-zy	49	77.3	3.35	52	75.5	3.11	2.81	43	77.2	2.82	34	74.6	2.63	4.19
go-go / zy-zy	49	73.6	5.69	52	77.3	3.16	3.91	43	76.2	3.48	34	76.9	2.56	1.01
n-gn / zy-zy	49	87.3	3.99	52	88.9	3.84	2.07	43	88.8	4.04	34	88.1	3.86	0.78
al-al / n-sn	49	62.0	5.30	52	61.2	5.74	0.64	43	61.7	6.00	34	61.0	4.81	0.57
v-sol	49	1690.2	57.98	52	1699.3	62.83	0.76	43	1689.8	58.56	34	1692.9	63.11	0.22
v-sitt	49	886.9	26.11	52	891.9	29.24	0.91	43	893.4	30.23	34	888.4	33.08	0.68
weight	49	61.5	7.21	52	70.3	10.02	6.24	43	62.5	7.28	34	67.4	9.22	2.54
a-a	49	394.5	17.54	52	390.2	23.32	1.05	43	389.6	14.78	34	381.5	18.84	2.06
thorax perimeter	49	908.3	48.02	52	948.9	68.88	3.88	43	911.0	49.19	34	929.4	56.16	1.48
i. cormic	49	52.5	1.26	52	52.5	1.26	-	43	52.9	1.74	34	52.5	0.96	1.25
i. Roehrer	49	1.29	0.15	52	1.44	0.19	3.75	43	1.30	0.11	34	1.40	0.16	17.50
a-a / v-sol	49	23.3	0.81	52	22.9	1.22	2.00	43	23.1	0.67	34	22.6	1.06	2.50

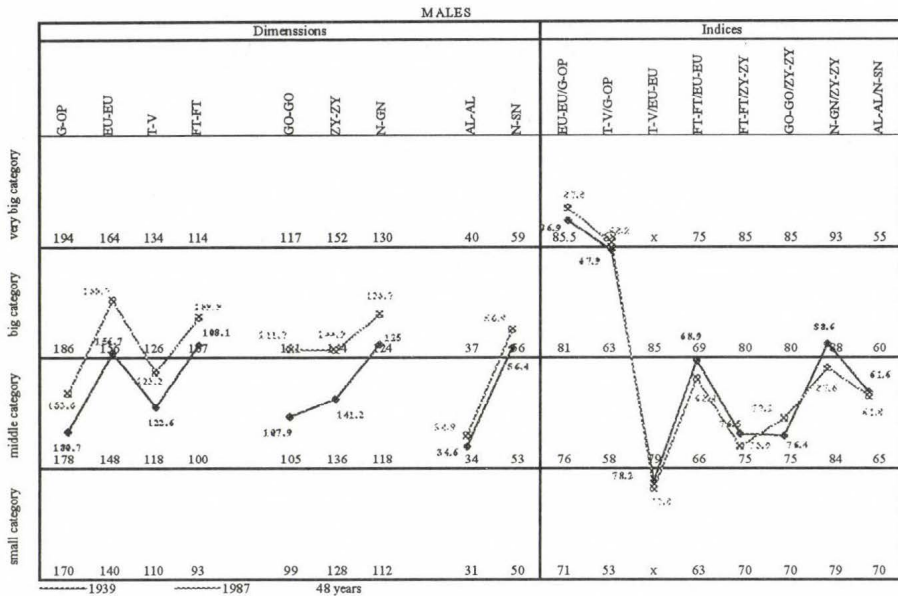


Fig. 3: Taxonomic Morphogram – Apuseni Mountains Region

The typological structure of these populations did not change (hyperbrachycephaly, and tapeinocephaly what concerns the brain pan, mesoprosopie face, and a mesorhine nose) but did reorganise especially in respect of the dimensions.

*Body proportions.* The body phenotype presents more variable diachronical changes than the brain pan and the face.

First, we emphasise that the well-known secular trend of stature growth is not generally in the populations of the Apuseni Mountains. Height increased with almost 3 cm in populations of Sălcuia and Posaga, but did not change in rest. This phenomenon is more interesting considering the fact that the time leap between our two researches surpasses a half of a century.

Marked dynamic changes show the environmental determined features. One of these is weight. Its increases within the limits of 4.9 to 8.8 kilos are reflected in the values of the Roehrer index. The former subeutrofic population's component is now well proportioned. Cormic index values vary also within the limits of normality. In the present-day populations the chest length decreases, the shoulders are narrower in regard with the absolute values of their dimensions but also when compared with stature. In addition, the thorax perimeter increases.

We can conclude that the body constitution of the studied populations varied from a middle aspect to a longish one.

### Conclusions

Important diachronical changes can be observed in Roumanian populations. The direction of these transformations is determined by the typological structure of the sample. This structure suffered over three decades' variations more or less intense, from



little dimensional changes to basic mutations.

The population of Apuseni Mountains region conserved its anthropological typology, but the present-day Alpine types no longer correspond to the classic description. We can compare this sample with other European countries (Billy 1968). Males from the studied area present similar characteristics with ones from French Alps: wide brain pan and hyperbrachycephaly, meso/leptoprosope face, mesorhine nose, rather high stature (Table 2).

In Vrancea county populations' the typology changed. The Mediterranean forms diminished leaving place to the Dinaric and Alpine elements (Table 1).

Both situations are not surprising. Roumanian paleoanthropologists discovered first brachycephal brain pan in the Neolithic, in Gura Baciului and Doboseni settlements (Transylvania). The moderate brachyskull from Gura Baciului-Cris Culture was considered as an Alpine type. The skull from Doboseni, obviously brachycephal and with a flat occipital bone was assigned to a Dinaric population. In the same period (Neolithic) the area limited by the Carpathians, the Danube, and the Balcans, was populate with Mediterranean elements, varying from primitive forms to the classic ones (Necrasov and Cristescu 1967).

We should emphasise some important aspects about the most studied features: stature and cephalic index with its composing dimensions. Our study does not demonstrate the stated positive correlation of the stature with the anterior-posterior diameter of the brain pan, or the negative correlation with the cephalic index. Males height increased, but also did the cephalic index (intensified brachycephaly). The dimension that obviously grew was the transversal brain pan diameter, not the anterior-posterior one. Our data show that, whatever the initial degree of brachycephaly, the rounding process of the callote continued.

However, we found one exception, which allows us to affirm that the general debrachycephalisation process started in our populations too. Present-day males sample from Ocolis display a 1 i.u. diminution of the cephalic index. Such evolution was also recognised on two other occasions. At first in the male samples from Fundu Moldovei and Ilisesti villages – but with a decrease of the cephalic index of only 0.42 i.u. (Less meaningfully than in our case). (Necrasov and Cristescu 1969). The second was present in male populations from the Bran Corridor, showing a 1.1 i.u. diminution of the cephalic index (Luca et al 1996).

Correlation between stature and cephalic index also reveals that where the tendency to debrachycephalisation appears, height increases only with 1cm. However, stature grew with 3 cm in the populations where the rounding of the brain pan continued. To this particular situation, we can not apply the law stated by E. Pittard.

The secular trend in Roumanian populations is not a constant process. Its particularities lead us to the conclusion that the problem is still open and further researches should be completed.

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## References

- Billy, G. (1960): Race alpine et type alpin. *VII-eme Congr. Intern. Sciences. Anthropol. Ethnol., Moscow*, 159-164.
- Billy, G. (1968): Nouvelles données sur l'évolution contemporaine des parametres raciaux. *L'Anthropologie*, 72, 1-2; 41-64.
- Enăchescu, Th., and Grintescu-Pop, S. (1973): Acceleratie si microevolutie. Studiu comparativ a două generatii de studenti: 1929-1972. *St. Cerc. Antropol.*, 10, 1; 35-44.
- Geană, G. (1985): Modernizare si deschidere demografică în zona Vrancei. *Viitorul social*, martie-aprilie, 149-156.
- Grintescu-Pop, S., Enăchescu, Th., and Georgescu, Vl. (1965): Morfograma taxonomică. *St. Cerc. Antropol.*, 2; 151-159.
- Luca, E., Cucu, D., and Stârcea-Crăciun, M. (1996): Diachronic Modifications in some Populations of the Bran Corridor. *Ann. Roum. Anthropol.*, 33; 43-51.
- Martin, R., and Saller, K. (1956): *Lehrbuch der Anthropologie in sistematischer Darstellung*. Fisher Verlag, Stuttgart.
- Necrasov, O., Pop, S., Enăchescu, Th., and Riscutia, C. (1964): Recherches anthropologiques dans une region relativement isolée des Carpathes Orientales: le pays de Vrancea. *Ann. Roum. Anthropol.*, 1; 45-54.
- Necrasov, O., and Cristescu, M. (1967): Aspecte antropologice ale neoliticului românesc. *St. Cerc. Antropol.*, 4, 2; 159-170.
- Necrasov, O., Grintescu-Pop, S., Cristescu, M., Enăchescu, Th., and Gramatopol-Rosca, E. (1967): Asupra unor fenomene de microevolutie observate în populatia actuală a României. *St. Cerc. Antropol.*, 4, 2; 175-184.
- Necrasov, O. (1968): Sur les méthodes de recherche concernant les phénomènes de microevolution. *Ann. Roum. Anthropol.*, 5; 31-35.
- Necrasov, O., and Cristescu, M. (1969): Nouvelles contributions a l'étude des phénomènes microévolutifs en Roumanie. *Ann. Roum. Anthropol.*, 6; 39-45.
- Olivier, G. (1960): *Pratique Anthropologique*. Vigot Freres Eds., Paris.
- Pop, S., Enăchescu, Th., and Georgescu, V. (1968): Contributions a l'étude du processus de dinarisation. *VII-eme Congr. Intern. Sciences. Anthropol. Ehnol., Moscow*, 155-157.
- Popovici-Bădărău, I., and Vlădescu, M. (1981): Phenotypic modifications in the populations of a rural settlement from Bihor county. *Ann. Roum. Anthropol.*, 16; 49-53.
- Rainer, Fr. (1937): *Enquêtes dans trois villages des Charpates*. Impr. Centr. Bucuresti.
- Vlădescu, M. (1988): La microévolution de quelques populations du Pays de Vrancea. *Ann. Roum. Anthropol.*, 25; 47-53.
- Vlădescu, M. (1989): Expression phénotypique de certaines transformations microévolutives chez la population de Nereju - Vrancea. *Ann. Roum. Anthropol.*, 26; 57-63.
- Vlădescu, M. (1990): Aspects microévolutifs chez une population des Monts Apuseni: Sălciua, département d'Alba. *Ann. Roum. Anthropol.*, 27; 25-35.
- Vlădescu, M. (1992): Aspects of the Microevolution of the Cephalic Index in Roumanian Populations. *Ann. Roum. Anthropol.*, 29; 29-35.

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