

A CONTRIBUTION TO THE ANTHROPOLOGY OF SLOVAKIA

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INTRODUCTION

Prof. Z. Frankenberg in his work "Anthropologie starého Slovenska" (The Anthropology of Old Slovakia), published in 1935, writes: "In Slovakia we find the field practically untouched. We know nothing about the physical characteristics of the present-day population except in quite general terms; no detailed information is yet available as to which pigment complexes are represented here and in what percentage, no information about the distribution of the body growth, what head forms are found here, etc." And really, the pre-war publications on Slovakia's population were not numerous and did not give complete information on physical characteristics. In the periodical "Anthropologie" there were published studies by Prof. Matiegka, Chrapko, Chura, Malý and others on the growth of the Slovak youth. K. Chotek made anthropological studies in Slovakia and pointed out the great heterogeneity of the population. V. Suk and A. Weiss were interested in the population of the easternmost Slovakia. The studies by Hečko, Kukura, Lipková and in particular the nation-wide research work led by V. Fetter in 1951 and 1961 and in the years 1955, 1960, 1965 on the occasion of the National Spartakiades, have provided data about the physical characteristics of the young and adult population after World War II. The Anthropological Institute of the Charles University did research on the forest workers in Slovakia in 1952. A systematic investigation was started after the year 1955 under the direction of J. Valšík by the Chair of Anthropology and Genetics, Faculty of Natural Sciences of the Comenius University in Bratislava. The analysis of the skeletal material from the archaeological investigation of prehistoric settlements and burials (Frankenberger, after the World War II: Vlček, Malá, Stloukal, Hanulík and others) help us to form a picture of the prehistoric populations of Slovakia.

THE METHOD

In the year 1959 we undertook along with M. Nováková an investigation into the adult population and pre-school children, i.e. the groups which had so far been neglected by the investigators, in 14

randomly selected places over the whole territory of present-day Slovakia. The choice of places had been done and the number of people to be investigated fixed by J. Hájek of the Institute of Mathematics of the Czechoslovak Academy of Sciences. We investigated the body weight and height, series of head dimensions and some basic descriptive characteristics (the eye and hair colours in three shades, the physical type according to three types and the form of the nose also according to three types: 1. convex, 2. straight or undulated, and 3. concave. Our investigation continued our preceding investigation into the school children of the age of 6 to 18 years and the investigation made by Ch. Troníček, K. Hajniš, A. Šobová and M. Stloukalová, the first of whom examined the younger age-groups of men and the others the population of Bohemia and Moravia. For this reason we fixed our attention upon women of the age of 18 and older and upon men mainly of the age of 40 and older.

Altogether 1506 women and 386 men were measured. The children's material is elaborated separately.

When scheming the investigation we took into account the fact that about a fifth of the invited persons would not appear and therefore 20 per cent more persons were invited. This proved realistic and the expected number of persons was kept to. Three of the places chosen at random are situated in the East-Slovakian Region (Diagram No. 1), four in the Central Slovakian Region, six in the West Slovakian Region, in proportion to the density of population. Our investigation was started at the easternmost locality and was finished at the westernmost. The original sequence of the visited communities was kept to even in elaborating the material. The first three figures indicate the investigated places in the southern part of the East Slovakian Region, the figure 4 and 5 the centre of Slovakia, figure six the community in the north near Námestovo, and figures 7, 8 the industrial centre Púchov, which attracts the workers from a wide area of west Slovakia. Figures 9 to 12 are places in the densely populated Váh Valley, and figures 14 and 15 indicate the capital town, Bratislava, and its surroundings.

- 9 Kubré
- 10 Radošina
- 11 Kolárovo
- 12 Diakovce
- 13 Vrakúňa
- 14 Bratislava

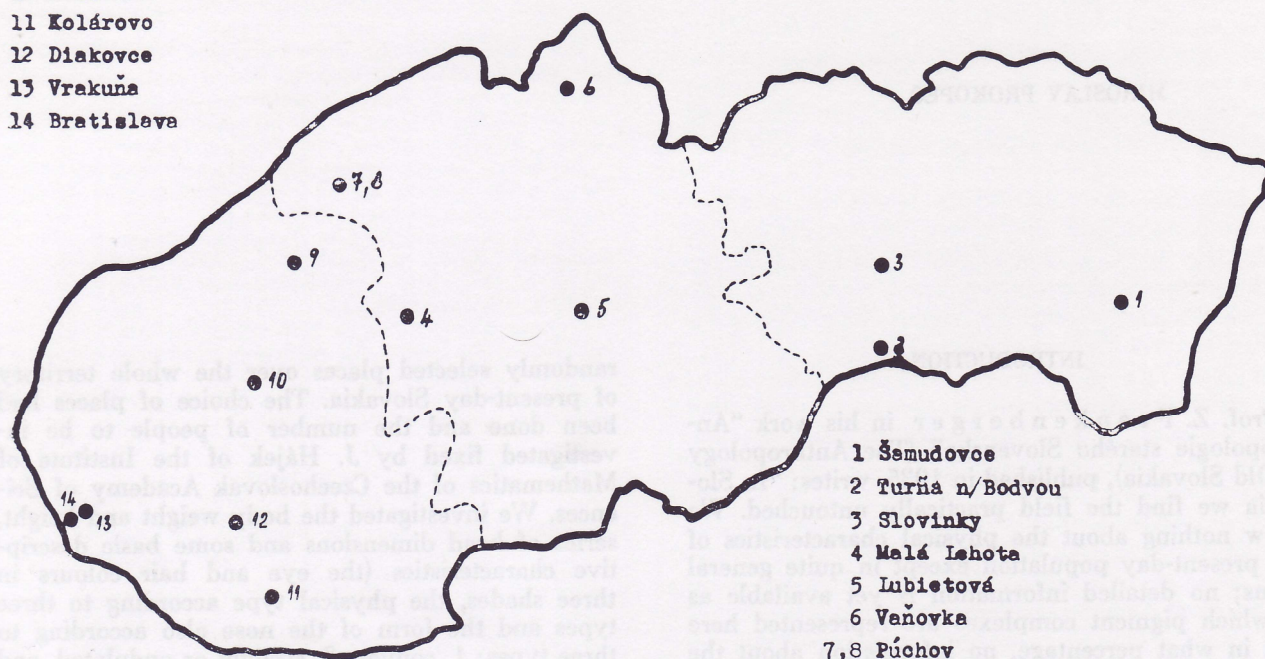


DIAGRAM 1

A diagrammatic chart of Slovakia with three regions entered: 1. West-Slovak (on the left), 2. Central-Slovak (in the middle), and 3. East-Slovak (on the right) with the places chosen at random, where the investigations took place.

THE MEASURED FEATURES

The investigation was drafted so that the results might give as far as possible a picture of the whole population of Slovakia and might serve as standards of measured features involved in the investigation. The measured features are given in Tab. 1, where the number of persons, the Average and the Standard Deviation from the Average are given (see

also Fig. 1 and 2). Special dimensions were measured on each fourth person examined. Certain indices had been determined of the measured features and Averages and Standard Deviations were calculated (see Tab. 1). These figures give a good idea of the face and head form of an average inhabitant of Slovakia, male and female, and the limits of variation of the values measured. Another paper deals with the age changes of the features examined.

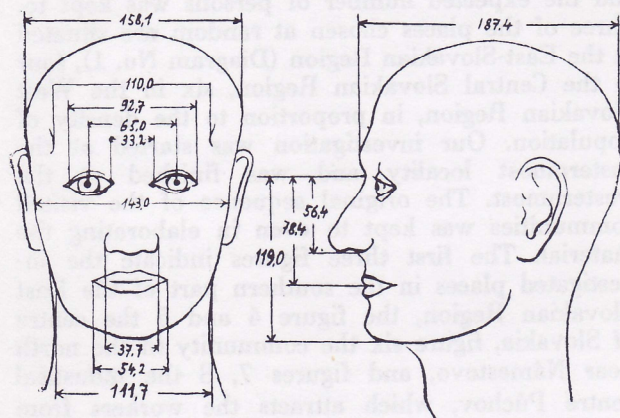


FIG. 1

Average Dimensions of the Head and Face of Men from Slovakia.

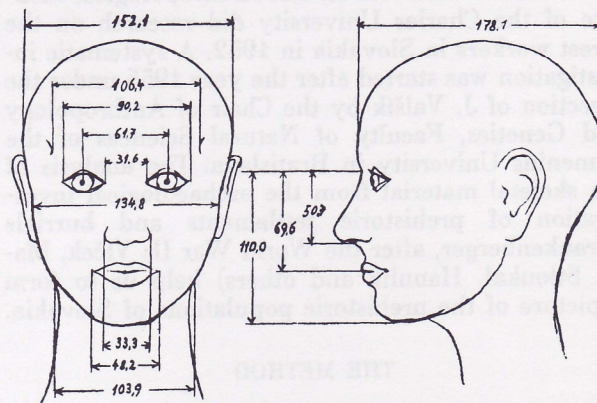


FIG. 2

Average Dimensions of the Head and Face of Women from Slovakia.

TAB. 1
Slovakia
Anthropometry of the adult population
(Prokopec 1965)

	Males (over 45 yrs)			Females (over 18 yrs)		
	n	\bar{x}	S. D.	n	\bar{x}	S. D.
Measurement:						
Body height (cm)	378	166,7	6,3	1517	156,7	6,4
Body weight (kg)	389	70,0	11,7	1339	68,0	11,7
Head length G-Op (mm)	390	187,4	6,2	1520	178,1	5,6
Head width						
Eu-Eu	392	158,1	5,6	1515	152,1	5,4
Min. frontal w. Ft-Ft	391	110,0	4,8	1515	106,4	4,4
Bizygomatic w. Zy-Zy	380	143,0	5,6	1520	134,8	5,5
Biogonial w. Go-Go	390	111,7	6,0	1161	103,9	6,9
Bipupillary dist.	94	65,0	3,8	353	61,7	3,5
Biectocanthial dist. Ek-Ek	93	92,7	4,5	360	90,2	4,4
Biendocanthial dist. En-En	91	33,2	3,2	359	31,6	3,2
Mouth width						
Ch-Ch	90	54,2	3,5	354	48,2	3,5
Nose width Al-Al	90	37,7	3,2	356	33,3	2,5
Nose height N-Sn	90	56,4	4,0	356	50,7	3,5
Facial height N-Sto	90	78,4	6,1	356	69,6	5,1
Indices:						
Cephalic	391	83,7	3,2	1595*)	85,3	3,4
Facial	392	84,4	5,9	1016	81,4	5,2
Frontoparietal	358	68,7	3,1	1518	69,3	2,9
Frontobigonial	383	98,6	6,0	1516	102,2	5,7
Frontobizygomatic	392	76,0	3,2	1437	78,2	2,9
Endo-ectocanthial (En-En in per cent of Ek-Ek)	91	35,2	3,1	359	34,6	3,3

*) age 18—45 years

THE DESCRIPTIVE FEATURES

The descriptive features are given in Table 2 and in Diagram 2. The eye and hair pigmentation does not show great differences between the sexes, with the only marked difference that 10 per cent of women were found with dark pigmentation of eyes compared with 5 per cent of men. Light eyes were found in nearly 30 per cent of men and women, the medium shades were found in 66 per cent of men and 63 per cent of women. Only less than 2 per cent of women and 3 per cent of men examined were fair-haired, the medium shades were found in less than 30 per cent of both sexes, the rest, i.e. about 70 per cent, were dark-haired of various shades. (Notes: In some cases of grey-haired people, where the original hair colour was not to be determined, the shade was not given; if the examined person's statement about his original hair shade was found reliable and could be verified by

TAB. 2
Slovakia
Descriptive features in the adult population
(Prokopec 1965)

	Males		Females (A)		Females (B)	
	n	per cent	n	per cent	n	per cent
Eye- and hair colour:						
Light eyes	104	28,9	131	27,8	225	22,9
Medium shades	239	66,1	294	62,2	606	61,5
Dark eyes	18	5,0	46	10,0	154	15,6
Light hair	8	2,2	6	1,3	54	5,5
Medium shades	106	29,5	137	29,0	417	42,3
Dark hair	245	68,3	329	69,7	514	52,2
Somatotype:						
Ectomorphic	79	22,8	77	17,0	97	10,3
Mesomorphic	223	64,5	194	42,7	639	67,5
Endomorphic	44	12,7	183	40,3	211	22,2
Nasal ridge shape:						
Concave	44	12,2	146	31,0	302	30,7
Straight	196	54,2	254	53,7	517	52,5
Convex	121	33,6	72	15,3	164	16,8

A — women over 45 years of age

B — women between 19 and 45 years of age

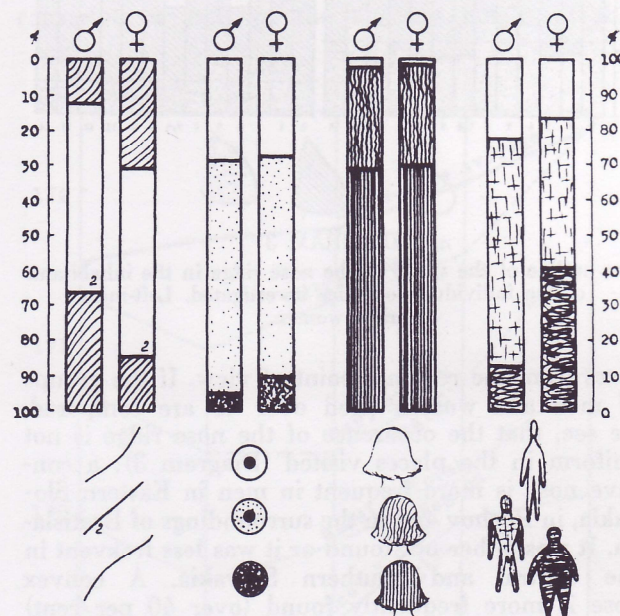


DIAGRAM. 2

The occurrence of the investigated features in Slovak men and women. From the left: the side view of the nose ridge, the eye colour, the hair colour, the body type.

further persons — i.e. family members —, it was taken into account.) At same places the people had strongly oiled hair, which darkened the hair colour so that it might have appeared darker.

Different conditions between the men and the women were found in two further descriptive characteristics. The straight nose ridge was found in 53 per cent of both men and women; the concave nose was more frequent in the women (30 per cent of wo-

men, 12 per cent of men); the convex nose ridge was again more frequent in the men (34 per cent of men, 15 per cent of women).

The body type was determined by aspect according to the criteria used by Sheldon, Tanner and Dupertuis. The ectomorphic type was found in about 23 per cent of men and in 17 per cent of women; the mesomorphic type was more frequent in the men, nearly in 65 per cent compared with the 43 per cent of women; the endomorphic type was about three times more frequent with the Slovak women, i.e. in about 13 per cent of men and in 40 per cent of women. The values given were found in men and women of an age over 45 years, where the comparison in our case was most advantageous.

REGIONAL DIFFERENCES

The uniform representation of our material from the different places visited allowed us to form groups of men and women from each locality and thus to evaluate the occurrence of the examined fea-

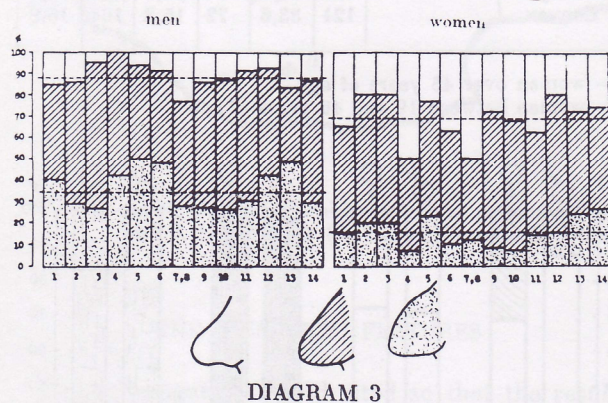


DIAGRAM 3

The outline of the shape of the nose ridge in the inhabitants of the individual localities investigated. Left-men, right-women.

tures from the regional point of view. If the groups of men and women aged over 45 are compared, we see, that the occurrence of the nose ridge is not uniform in the places visited (Diagram 3): a concave nose is more frequent in men in Eastern Slovakia, in Púchov and in the surroundings of Bratislava. It was either not found or it was less frequent in the Central and Southern Slovakia. A convex nose is more frequently found (over 40 per cent) in localities in the central and northern parts of the Central-Slovakian Region and in two localities of Southern Slovakia. A more conspicuous occurrence of the concave nose in women falls to localities 4, 7, and 8 — nearly 50 per cent. About 25 per cent and more women had a convex nose ridge in localities 5, 13 and 14.

The lightest eye shades (Diagram 4) were found in the Eastern and Central parts of Slovakia both in men and women. The highest percentage of dark-eyed persons was found in localities 3, i.e. in Slovinky, in Púchov both in men and women, further in men in Lubietová and in women in Kolárovo. Dark eye shades were not found both in men and

women in Malá Lhota and in men in Turňa nad Bodvou and in Vaňovka. The representation of individual hair shades in the inhabitants of the localities visited shows rather a lack of uniformity (Diagram 5), the fairest hair being found rarely, more frequently in the Eastern part of the country. Kolárovo was shown to be the locality with the highest percentage of dark haired equally in both sexes. Worth mentioning is the divergency in the occurrence of light and medium shades in women and men in Slovinky (64 per cent in women compared with 23 per cent in the men).

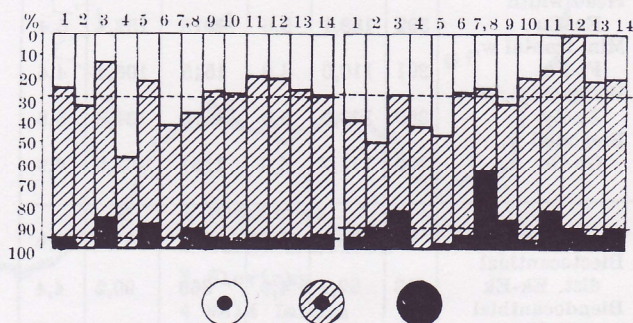


DIAGRAM 4

The eye colour of the inhabitants of the investigated localities. Left-men, right-women.

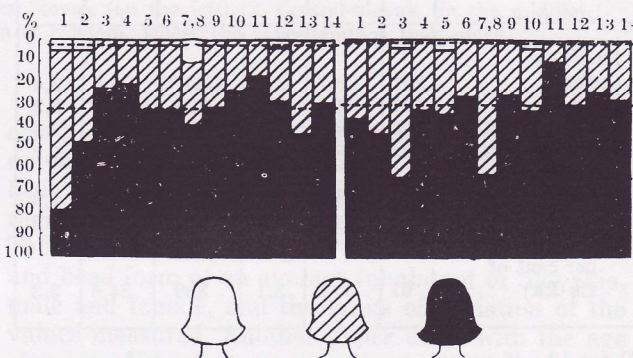


DIAGRAM 5

The hair colour of the inhabitants of the investigated localities. Left-men, right-women.

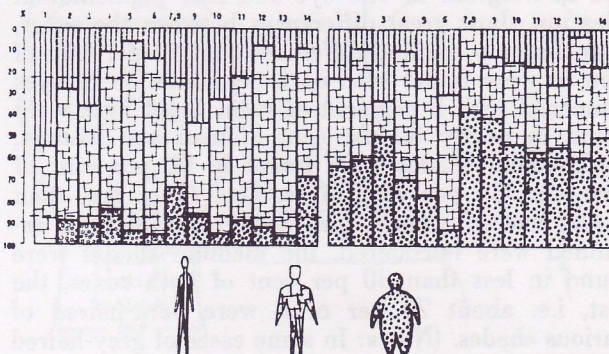


DIAGRAM 6

The body type of the inhabitants of the investigated localities. Left-men, right-women.

TAB. 3

Slovakia

Cephalic, facial and nasal indices in the adult inhabitants of various localities
(Prokopec 1965)

Locality	Cephalic index				Facial index				Nasal index			
	Males		Females		Males		Females		Males		Females	
	n	\bar{x}	n	\bar{x}	n	\bar{x}	n	\bar{x}	n	\bar{x}	n	\bar{x}
1	15	85.2	63	86.0	15	84.4	63	85.5	4	71.0	18	63.0
2	18	83.3	66	85.2	18	87.2	65	82.8	4	62.7	19	61.2
3	19	83.4	64	86.3	19	86.7	64	83.6	6	67.0	17	63.0
4	16	84.5	63	85.6	16	86.4	64	83.6	5	63.8	18	63.0
5	15	82.8	59	86.5	15	87.2	59	84.2	5	65.0	20	64.2
6	18	84.7	56	85.2	18	86.2	56	86.5	5	63.8	19	62.0
7, 8	38	83.9	110	86.6	38	83.6	110	80.3	11	65.2	35	64.2
9	17	86.1	72	86.4	17	82.1	70	79.4	7	74.5	22	70.9
10	31	84.3	78	85.7	31	83.6	77	79.8	10	65.6	25	69.4
11	43	83.0	139	85.1	43	84.3	139	79.5	13	70.0	46	68.8
12	22	83.6	76	85.1	22	83.5	76	80.5	6	70.2	25	68.3
13	17	83.3	61	84.7	17	83.0	61	79.2	6	73.3	15	65.8
14	30	84.0	224	84.6	30	84.4	234	81.1	10	70.0	71	65.5

1 — Šamudovce
2 — Turňa n. Bodvou
3 — Slovinky
4 — Malá Lehota
5 — Lubietová
6 — Vaňovka

7, 8 — Púchov
9 — Kubrá
10 — Radošina
11 — Kolárovo
12 — Diakovce
13 — Vrakuňa
14 — Bratislava

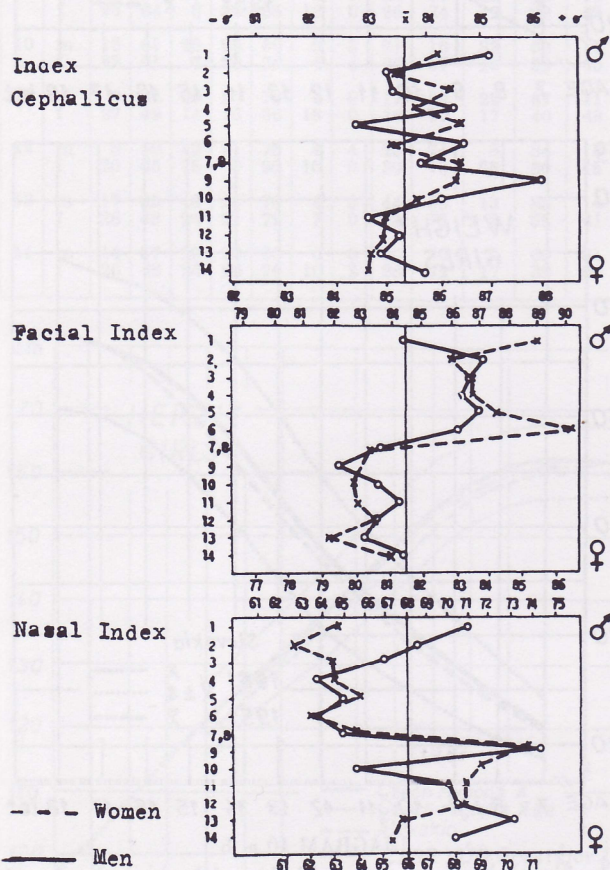


DIAGRAM 7

The head, face and nose indices of the inhabitants of the investigated localities.

The occurrence of the body type (Diagram 6) shows not only a fundamentally different picture in men and in women, but it also varies even from place to place. The endomorphic type was not found at all in men in Šamudovce, it is rare in

small remote places and conspicuous in the industrial centres (Púchov, Bratislava).

The most numerous appearance of the ectomorphic type was in Šamudovce, Slovinky and Kubrá.

The smallest number of the endomorphic types was in women in Vaňovka (locality 6) and the greatest in Púchov and Kubrá (See Tab. 4).

The regional differences show also some relative dimensional characteristics — indices, such as the face and nose indices; less clear is the cephalic index (see Diagram 7, Table 3).

BODY HEIGHT AND WEIGHT IN SLOVAKIA

From all regional investigations hitherto made it can be concluded that the body height of the individual groups both of the young and the grown-up people increases from the East to the West in Czechoslovakia. This is particularly clear in Slovakia. The further analysis shows that in industrial centres the average height is greater than in villages and small places and that in big towns we can see most clearly the acceleration of growth which means an accelerated maturation of the youth. As early as in Matiegka's works from his diagrams of body height made on the basis of the conscripts a shift of the average height in this

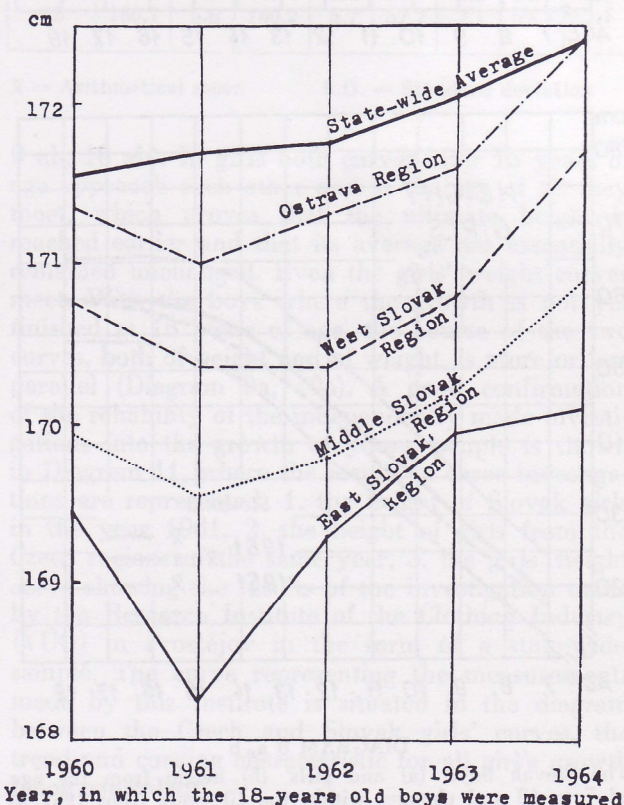


DIAGRAM 8

The average body height of the 18-year-old boys and its development from 1960 to 1964 in the individual Slovak regions and in the region of Ostrava compared with the state-wide height average.

country from the East to the West is evident. This can be well shown on the average height of the 18-year-old boys measured every year from 1960 to 1964 (see Diagram 8). In comparing the curves we can see that the year class with the lowest average height in all Slovak regions was in 1961 and that from 1962 in all these Slovak regions and in the Ostrava region which is represented as well in the diagram, the average height has been increasing. For all four years investigated the Slovak regions have retained their sequence as to the aver-

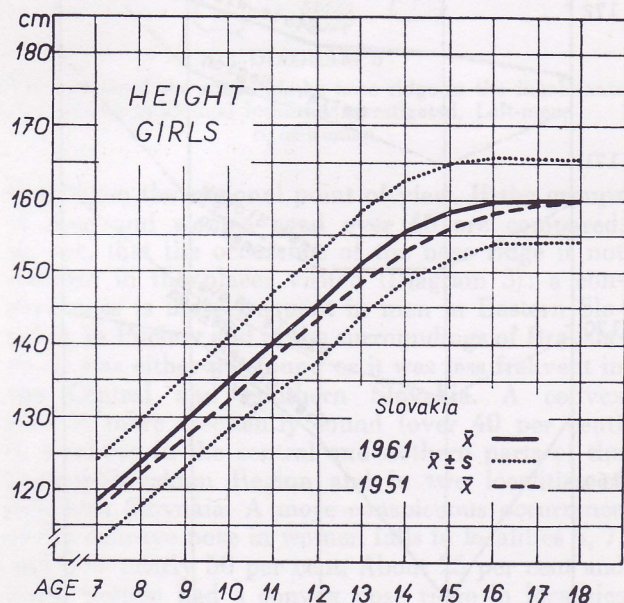
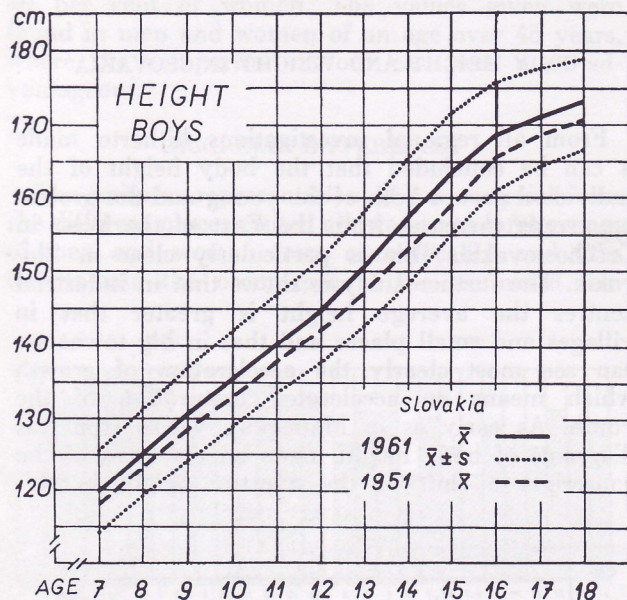


DIAGRAM 9 a, b

The Slovak boys' (a) and girls' (b) height from the age of 7 to 18 and changes within the 10 years from 1951 to 1961 (by Fetter, Prokopec, Suchý, Lipková).

age height, the greatest height being reached in the West-Slovakian and the lowest in the East-

Slovakian regions. The Slovak regions along with the Ostrava region (N. E. Moravia) are below the State-wide height Average.

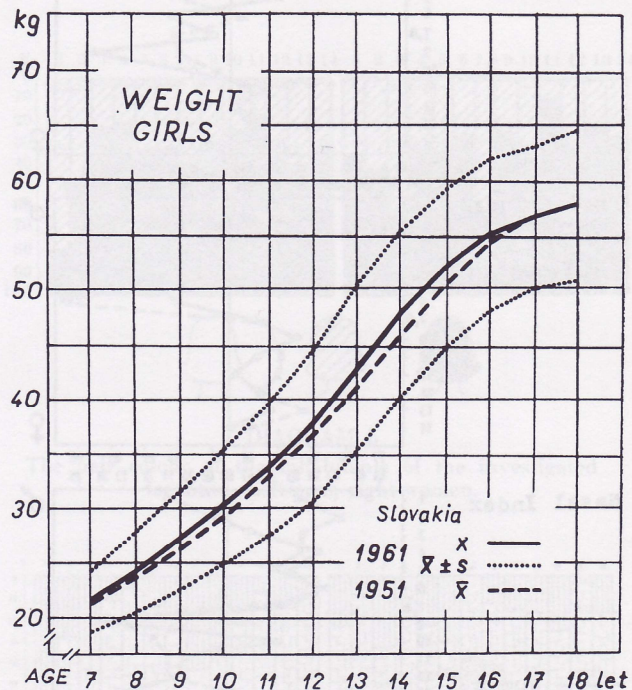
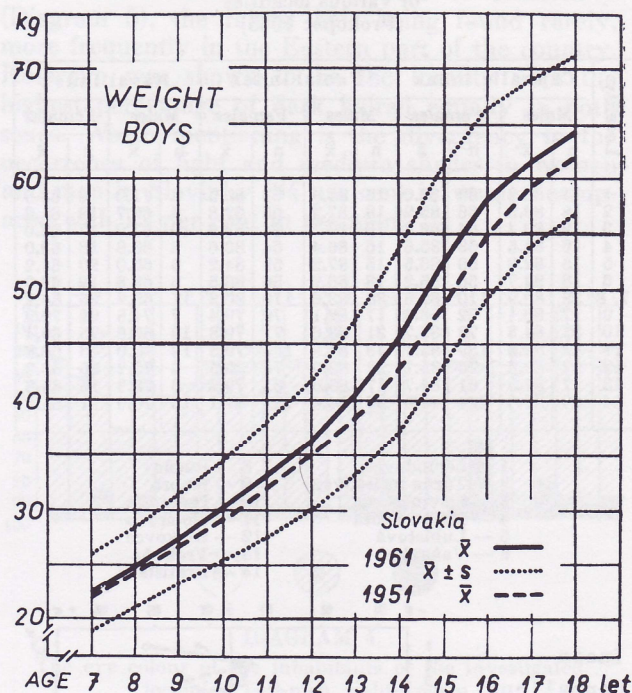


DIAGRAM 10 a, b

The Slovak boys' (a) and girls' (b) weight from the age of 7 to 18 and changes within 10 years from 1951 to 1961 (by Fetter, Prokopec, Suchý, Lipková).

Two successive investigations into the growth of the Slovak youth made at an interval of ten years 1951 and 1961 (by Fetter and associates) show an increase of the average boys' and girls' height and weight by one fourth to one half of the Standard Deviation between 7 and 18 years of age (Diagram

TAB. 4

Slovakia

Regional analysis of descriptive features in the adult population (in percent)
(Prokopec 1965)

Locality	Sex	Nasal ridge shape			Eye colour			Hair colour			Somatotype		
		concave	straight	convex	light	med.	dark	light	med.	dark	morphic		
											ecto-	meso-	endo-
1	m	15	45	40	25	70	5	5	74	21	55	45	0
	f	35	50	15	40	55	5	0	57	63	23	41	36
2	m	14	57	29	33	67	0	5	43	52	28	61	11
	f	20	60	20	50	42	8	0	44	56	9	52	39
3	m	5	68	27	14	72	14	0	23	77	36	55	9
	f	20	60	20	28	56	16	4	60	36	33	17	50
4	m	0	58	42	58	42	0	0	11	39	11	73	16
	f	50	43	7	43	37	0	0	33	67	10	60	30
5	m	6	44	50	22	67	11	0	33	67	6	88	6
	f	23	54	23	47	51	2	5	30	65	23	54	23
6	m	9	43	48	43	57	0	0	33	67	14	81	5
	f	37	53	10	27	67	6	0	27	73	30	63	7
7, 8	m	23	49	28	37	54	9	10	30	60	26	48	26
	f	50	38	12	25	38	37	0	62	38	—	38	62
9	m	14	59	27	27	68	5	0	32	67	43	43	14
	f	28	64	8	32	55	13	0	26	74	12	29	59
10	m	13	61	26	28	68	3	3	21	16	33	62	5
	f	32	61	7	20	76	4	4	29	67	15	39	46
11	m	9	61	30	20	76	4	0	17	83	22	67	11
	f	37	49	14	16	66	18	0	10	90	17	40	43
12	m	8	50	42	21	75	4	4	25	71	8	84	8
	f	20	65	15	0	90	10	0	30	70	25	30	45
13	m	17	35	48	26	70	4	0	44	56	13	83	4
	f	28	48	24	21	72	7	0	24	76	3	55	41
14	m	14	57	29	28	66	6	0	30	70	9	60	31
	f	26	48	26	20	70	10	2	26	72	17	33	50

TAB. 5

State-wide anthropometrical survey 1951 and 1961 — Slovakia
(Fetter V., Lipková V., Prokopec M., Suchý J.)

Age years	Height (cm)				Weight (kg)			
	1951		1961		1951		1961	
	\bar{x}	S. D.	\bar{x}	S. D.	\bar{x}	S. D.	\bar{x}	S. D.
Boys								
7	117.7	5.7	119.8	5.3	22.0	3.0	22.4	3.4
8	123.2	5.8	125.0	5.6	24.3	3.0	24.7	3.6
9	128.2	6.2	130.3	5.7	26.6	3.6	27.2	3.8
10	132.4	6.4	135.2	6.1	29.0	4.1	29.9	4.3
11	137.8	6.5	139.8	6.3	32.1	4.5	32.8	5.1
12	141.8	7.1	144.3	6.7	34.7	5.2	36.0	5.7
13	146.9	7.9	150.2	7.8	38.2	6.2	40.2	7.0
14	152.5	8.5	156.7	8.6	42.7	7.5	45.4	8.1
15	158.9	9.2	163.4	8.3	48.5	8.8	52.2	8.9
16	165.2	8.1	168.3	7.4	54.8	8.2	58.1	8.3
17	168.5	7.1	170.7	6.7	59.2	7.5	61.5	7.6
18	170.4	6.6	172.6	6.1	62.0	7.2	64.1	7.3
Girls								
7	116.9	5.8	118.4	5.2	21.4	3.0	21.6	2.9
8	122.3	5.9	123.7	5.5	23.7	3.4	24.0	3.6
9	127.1	6.1	129.5	6.0	26.1	4.0	27.0	4.3
10	132.3	6.4	134.8	6.4	29.1	4.8	30.0	5.3
11	138.3	7.3	140.1	7.0	32.8	5.6	33.4	6.1
12	143.4	7.9	145.2	7.3	36.4	6.9	37.5	6.9
13	148.7	7.5	151.5	7.1	40.8	7.2	42.7	7.7
14	153.1	7.0	156.0	6.4	45.7	7.8	47.8	7.7
15	156.4	6.6	158.5	6.1	50.2	7.9	51.8	7.4
16	158.5	6.0	160.1	5.6	54.1	7.3	54.8	7.1
17	159.8	5.8	160.2	5.4	56.7	6.5	56.4	6.5
18	160.1	5.8	160.2	5.7	57.7	7.1	57.7	7.1

 \bar{x} = Arithmetical mean

S.D. = Standard deviation

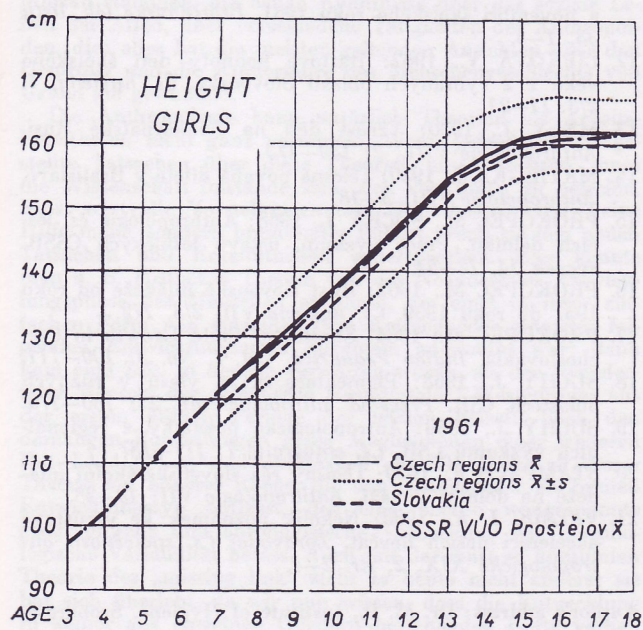


DIAGRAM 11

The comparison of the average girls' height in the Czech and Slovak regions on the basis of the investigation of 1961 (Fetter, Prokopec, Suchý, Lipková) with the results of the independently made investigation by the Research Institute of the Clothing Industry in Prostějov on the basis of a sample from the whole country.

9 ab, 10 ab). In girls both curves after 15 years of age approach each other and at the age of 18 they meet, which proves that the ultimate height is reached earlier and that its average has essentially remained unchanged. Even the girls' weight curves meet. With the boys where the growth is not yet finished at 18 years of age, the course of the two curves, both of height and of weight, is more or less parallel (Diagram 9a, 10a). A good confirmation of the reliability of the independently made investigations into the growth of young people is shown in Diagram 11, where the results of three investigations are represented: 1. the height of Slovak girls in the year 1961, 2. the height of girls from the Czech regions of the same year, 3. the girls' height curve showing the results of the investigation made by the Research Institute of the Clothing Industry (VÚO) in Prostějov in the form of a state-wide sample. The curve representing the measurements made by this Institute is situated in the diagram between the Czech and Slovak girls' curves, the trend and curving characteristic for all girls' growth being coincident.

If compared with the results of the investigation of the years 1956 to 1958 (Diagram 12 and 13) in Poland, the Slovak children are in average taller and heavier, but this difference becomes lesser and in some cases disappears, if we compare the

Polish average figures with those of the year 1951. The Polish youth is consequently very similar to the Slovak youth in their growth.

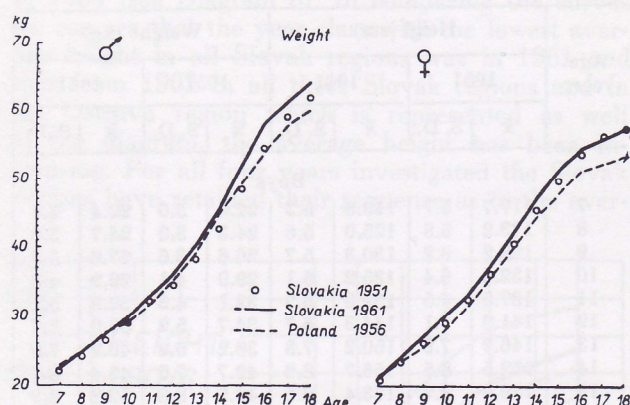


DIAGRAM 12

The comparison of the average Slovak children's height on the basis of the investigations made in 1951 and 1961 (Fetter and associates) with the result of the Polish investigation (Górny and associates).

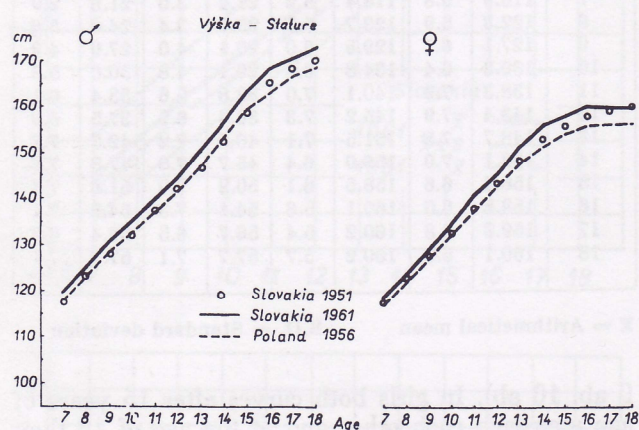


DIAGRAM 13

The comparison of the average Slovak children's weight on the basis of the investigations (by Fetter and associates) made in 1951 and 1961 with the results of the Polish investigation (Górny and associates).

CONCLUSION

I have mentioned the results of the anthropological investigation in 14 randomly chosen places in Slovakia, giving information about stature, body weight, the head and face dimensions, pigmentation, and the body type of the population with nation-wide validity. By analysing the results from the individual places there have been found regional peculiarities in the investigated features giving evidence of the existence of type peculiarities among the inhabitants of the individual Slovakian regions (hair and eye pigmentation, height-width proportion of the face and nose). Furthermore the new material

has shown the state of body development of young people and its changes in the course of the last few years, showing a rising trend while preserving the constant demonstrable difference in the different regions as regards average height, which increases from East to West.

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