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A CONTRIBUTION TO THE STUDY OF BIOLOGICAL VARIABILITY OF VIETNAMESE STUDENTS

ABSTRACT — *In the present study we oriented our research on following the physical variability of 96 Vietnamese students (72 men and 24 women) aged 19–39. All of them came from the Democratic Republic of Vietnam. In a complex of morphophysical examinations they appeared as follows:*

1. *Men had dark eyes, black hair. They were slightly brachycephalic with a face in absolute dimensions medium high and wide; they were euryprosopic and mesorrhine with a trend towards chamaerhiny. According to the average stature the men appeared to be of medium growth, had a relatively long trunk of rectangular outline. Their upper limb was medium long (the same goes for the upper and the lower arm), their hand was medium wide. The lower limb was relatively long with a long thigh, but medium long lower leg. According to Manouvrier's index the men were mesatiscelic, according to Rohrer's index medium corpulent.*

2. *Characteristic of Vietnamese women was dark complexion, brachycephaly, eurymesoprosopy and mesorrhiny. By their average stature they were above-medium, had a relatively long trunk, medium wide shoulders, but relatively narrow hips. Their upper limb was on the average medium long, the hand was narrow. The lower limb was proportional according to the femorotibial index. Their constitution was mesatiscelic and/or medium corpulent.*

3. *The examined set of men was by its character incorporated into the variation regions with which it was connected.*

KEY WORDS: *Vietnamese students — Morphophysical characteristics of pigmentation — Head dimensions — Dimensions of the trunk and limbs — Proportions — Constitution.*

The study of the Vietnamese at universities and further institutions and plants in the South Moravian Region gave us a welcome opportunity of examining them anthropologically from all aspects and of properly evaluating their morphological structures.

Anthropological data about the Vietnamese (mostly from Annam) are included in the papers by Nguyen-Dinh-Xuan (1963), Wastl J. (1965), Olivier G. and Moullec J. (1968), Nguyen-Quang-Quyen and Do-Nhu-Cuong (1972) and others. They are data of extreme value, since they constitute the basis for following possible microevolutionary processes in the given population. Our study contributes partially to this set of problems.

MATERIAL AND METHODS

In 1973 we examined 72 Vietnamese men and 24 Vietnamese women whose age varied from 19 to 39 years (*Table I*). At the time of examination they studied at the universities of Brno, which meant that during their stay in the South Moravian Region they were subject to the same way of life, including the regime of the day. We did not have any further data available on the nature of this set. In this connection we can consider the studied set to be an accidental grouping of individuals who, from the point of view of studies, belonged among the people best suited for studies in the People's Republic of Vietnam.

TABLE 1. Age structure of the sample examined from Vietnam

Age	N	Men	Women
x-19	5	2	3
20-24	70	50	20
25-29	11	10	1
30-34	9	9	0
35-39	1	1	0
Total	96	72	24

TABLE 2. Birth-place

	N	Men	Women
North Vietnam	63	47	16
Middle	29	22	7
South	4	3	1

All the individuals studied were examined within the scope recommended by the International Centre for I.B.P. in London (Weiner J. S., Lourie J. A., 1969); it was related to 46 measuring characters and 2 descriptive characters.

With the exception of the stature measured according to the Martin methodological instruction (Martin R., Saller K., 1956), all further somatic metric and descriptive characters were obtained according to Tanner's recommendation (see Weiner J. S., Lourie J. A., 1969). That means that vertical, transversal and circumferential dimensions including the skinfold thickness were measured on the left half of the body.

For measuring the prescribed instruments were used: the cephalometer, the anthropometer, the caliper and the pelvimeter were made by Siber Hagner (Switzerland), the Collins dynamometer was made in the USSR, the caliper (Harpenden) and the spirometer were of Czechoslovak production. Body weight was found with the help of a lever balance. Circumferences were measured with a tailor's tape-measure. Hair colour was tested by the Fischer-Saller scales and the colour of the iris by the Martin scale.

The anthropological examination proper was carried out in the anthropometrical laboratory in the morning hours.

RESULTS AND DISCUSSION

PIGMENTATION — EYE AND HAIR COLOUR (Table 3)

The colour of the iris varied in the men and women examined only in the limits black-brown to dark and brown; hair colour from black to dark brown. In some dark brown hair there was a trend to rutilism (mahogany).

A prevailing majority of men and women (80 to 95%) had dark brown eyes and black hair (87% men and 80% women), black-brown eyes

occurred only in 4% of men and 5% of women; brown eyes occurred only in men (16%).

Dark brown hair was found in 13% of men and 15% of women. Brown hair with a tinge of rutilism occurred in one woman only.

The obtained results concerning eye and hair colour correspond roughly to the situation obtained in the Vietnamese, Chams and Mois by Olivier G. (1968). This author dealing with the pigmentation of ethnics of the former Cochinchina says that by their pigmentation the Vietnamese approach approximately the inhabitants of south China, particularly as the complexion which in the south Chinese is light, the lightest in Indo-China. Besides, Olivier (Olivier G., 1968) observed in 38% of men aged 30 to 39 the onset of the hair growing gray, which in our men was not observed in a single case.

TABLE 3. Pigmentation

Colour of iris	Men		Women	
	N	%	N	%
black — and — brown (1)	3	4.3	1	5
dark — and — brown (2-3)	55	79.7	19	95
brown (4)	11	15.9	—	—
Hair colour				
black (Y)	60	86.9	16	80
dark — and brown (X, W)	9	13.0	3	15
brown (U)	—	—	1	5
Colour complexes				
black — and — brown (1)	3	4.3	1	5
× black (Y)	—	—	—	—
dark — and — brown (2-3)	49	71.0	155	75
× black (Y)	—	—	—	—
dark — and — brown (2-3)	—	—	—	—
× dark — and — brown (X, W)	6	8.6	3	15
brown (4) × black (Y)	8	11.6	—	—
brown (4) × black (X, W)	3	4.3	—	—

HEAD DIMENSIONS

CRANIUM

The examined students of Vietnam had on the average a long (191.4 mm) and wide head (158.8 mm), the value of the average for the head length falling towards the upper limit of the category of long heads, whereas the average for the head width tended rather to the limit of medium wide to wide heads (Table 4).

In the girl students of Vietnam the average for head length was 182.3 mm and for the head width 151.4 mm. Thus, also the women examined had on the average a long head with an inclination towards greater widths. The sex difference in the two absolute dimensions was evident.

From the comparison with accessible data about the Vietnamese as compiled by Olivier G. and Moullec J. (1968) it follows that our subjects (men) had the head on the average bigger, i.e. longer and wider than the compared groups originating from Vietnam.

TABLE 4. Cephalometric measurements and indices in men and women

Characteristics	Men			Women			t test
	N	\bar{x}	s	N	\bar{x}	s	
Head length	72	191.4	4.96	24	182.3	5.91	7.366
Head breadth	72	156.8	5.16	24	151.4	5.23	4.402
Cephalic index	72	82.0	3.20	24	82.8	4.31	0.836
Head height	72	132.2	9.31	24	132.1	7.60	0.039
Head height — length index	72	69.1	6.51	24	73.0	5.47	2.878
Head height — breadth index	72	84.1	8.24	24	88.6	7.64	2.448
Face height (nasion to gnathion)	72	113.9	7.05	24	108.9	4.89	3.192
Bizygomatic diameter	72	137.8	7.88	24	136.7	8.69	0.605
Bigonial diameter	72	108.4	6.29	24	105.8	6.19	1.704
Morphological facial index	72	83.1	6.07	24	80.9	7.23	1.341
Nose height	72	47.3	4.53	24	49.5	3.43	2.248
Nose breadth	72	39.7	2.13	24	39.1	3.61	0.770
Nasal index	72	84.9	9.32	24	80.5	10.86	1.778
Mouth width	72	49.7	3.50	24	49.7	3.91	0.016
Lips thickness	72	21.6	3.62	24	21.5	4.10	0.078
Mouth index	72	43.4	7.45	24	43.5	8.25	0.053

The head index exhibited the mean value of 82 units for men and 82.8 units for women. That means that both men and women were on the average brachycephalic, to which also corresponds the structure of the values in the categories of this index; most women were grouped in the brachycephalic category with a trend to meso- to dolichocephaly.

If we divide our set according to the regional viewpoint we find that the differences correspond to data from literature (lower index values in the north, higher in the central regions).

The head height exhibited the same value for men and women, being relatively considerable; men and women had the cranium absolutely high, substantially higher than that recorded by Olivier G. and Moullec J. (1968) and Wastl J. (1965).

According to the length-height index of the head the men were chamaecephalic, but the women orthocephalic (Table 5). In the 1 width-height index of the head we found in the men examined a transition from metriocephaly to acromiocephaly, in women then apparent acromiocephaly. Our finding is in full agreement with data by Olivier G. (1968) and by Wastl J. (1965).

FACE

The height of the face of the subjects was variable. Our set was constituted by individuals with faces of all categories, i.e. with very low to high ones. The mean value for men fell to the lower limit of short faces, in women it was at the lower limit of medium high faces.

Vietnamese men had faces that were on the average medium wide with a trend of becoming slimmer, in the women we found faces rather medium wide to wide. The two dimensions exhibited a sex difference, a greater one in the case of the height, which, of course, is quite common in all human groups.

The mean height of the face of the men did not differ substantially from the mean face height of the

Vietnamese measured by Olivier (Olivier G., 1968). It was, however, essentially lower than the face height as measured by Wastl (Wastl J., 1965). We further state that the men of our set had faces on the average higher than had the Vietnamese recruits (113 mm) and the Vietnamese from the south (111 mm) (see Olivier G. and Moullec J., 1968, p. 125).

As for the face width, the mean value for the men does not reach the upper limit of the mean values so far established for the territory of Vietnam.

The morphological index of the face of the examined Vietnamese men was 83.1 units and in women 80.9 units.

The established mean value for men falls within the limits of variability of mean values for the territory of Vietnam, approximately into the upper half of the range (see Olivier G. and Moullec J., 1968, p. 129). For easier and correct comparison we distributed our set into regional connections, finding that the group of Vietnamese from the central region had the face relatively lower (82.8 ± 1.3) than the group from the north (86.5 ± 0.6).

This information is interesting, of course if it is not due to accidental grouping. But it was also arrived at by Olivier G. (1968), who is of the opinion that the face index rises from the south to the north and from the southeast to the northwest. In comparing our northern and central groups with regionally equivalent ones we do not find substantial differences, so that by their face index our men fall within the variation range of the respective regions.

The nose of the examined men of Vietnam was, according to the average values, short and medium wide; according to the height-width index meso- to chamaerhines prevailed, in women mesorrhines.

The values, as found by us, differed mostly from the compared ones. Olivier G. (1968) and Wastl J. (1965) give in their sets absolutely higher and narrower noses with an expressively mesorrhine index. Only Chabeuf M. (1967) with his absolute values approaches our data.

The width and the thickness of lips were relatively variable. According to the mean value of the lip

TABLE 5. Distribution of cephalometric measurements and indices into quantitative categories

Characteristic	Category	Limits of categories					
		Men			Women		
			N	%		N	%
Head length (Lebzelter, Saller)	Very short	x-163	0	0	x-161	0	0
	Short	170-177	0	0	162-169	0	0
	Medium	178-185	14	19.4	170-176	5	20.9
	Long	186-193	29	40.3	177-184	11	45.8
	Very long	194-x	29	40.3	185-x	8	33.3
	Total		72	100		24	100
Head breadth (Lebzelter, Saller)	Very narrow	x-139	0	0	x-134	0	0
	Narrow	140-147	3	4.2	135-141	1	4.2
	Medium	148-155	31	43.0	142-149	10	41.6
	Wide	156-163	31	43.0	150-157	10	41.6
	Very wide	164-x	7	9.8	158-x	3	12.6
	Total		72	100		24	100
Cephalic index (Saller)	Hyperdolichocephalic	x-70.9	0	0	x-71.9	0	0
	Dolichocephalic	71.0-75.9	2	2.8	72.0-76.9	4	16.6
	Mesocephalic	76.0-80.9	20	27.8	77.0-81.9	5	20.9
	Brachycephalic	81.0-85.4	40	55.5	82.0-86.4	10	41.6
	Hyperbrachycephalic	85.5-90.9	10	13.9	86.5-91.9	5	20.9
	Ultrabrachycephalic	91.0-x	0	0	92.0-x	0	0
Head height-length index (Iwanowsky)	Chamaecephalic	x-72.0	56	77.8	x-72.0	12	50
	Orthocephalic	72.1-75.0	5	6.9	72.1-75.0	5	20.9
	Hypsicephalic	75.1-x	11	15.3	75.1-x	7	29.1
	Total		72	100		24	100
Head height-breadth index (Martin)	Tapeinocephalic	x-78.9	18	25.0	x-78.9	2	8.3
	Metriocephalic	79.0-84.9	23	32.0	79.0-84.9	6	25.0
	Acromiocephalic	85.0-x	31	43.0	85.0-x	16	66.7
	Total		72	100		24	100
Face height (Lebzelter, Saller)	Very short	x-111	29	40.3	x-102	3	12.5
	Short	112-117	21	29.2	103-107	7	29.2
	Medium	118-123	16	22.2	108-113	8	33.3
	Long	124-129	4	5.6	114-119	6	25.0
	Very long	130-x	2	2.7	120-x	0	0
	Total		72	100		24	100
Bizygomatic diameter (Lebzelter, Saller)	Very narrow	x-127	10	13.9	x-120	1	4.2
	Narrow	128-135	19	26.4	121-127	2	8.3
	Medium	136-143	28	38.9	128-135	10	41.6
	Wide	144-151	14	19.4	136-142	7	29.2
	Very wide	152-x	1	1.4	143-x	4	16.7
	Total		72	100		24	100
Morphological facial index (Martin)	Hyperuryprosopie	x-78.9	18	25.0	x-76.9	5	20.9
	Euryprosopie	79.0-83.9	29	40.3	77.0-80.9	6	25.0
	Mesoprosopie	84.0-87.9	10	13.9	81.0-84.9	10	41.6
	Leptoprosopie	88.0-92.9	10	13.9	85.0-89.9	2	8.3
	Hyperleptoprosopie	93.0-x	5	6.9	90.0-x	1	4.2
	Total		72	100		24	100
Nose height (Michalsky)	Very short	x-45	34	47.2			
	Short	46-49	15	20.8			
	Medium	50-54	18	25.0			
	Long	55-59	4	5.6			
	Very long	60-x	1	1.4			
	Total		72	100			
Nose breadth (Michalsky)	Very narrow	x-29	0	0			
	Narrow	30-35	1	1.4			
	Medium	36-39	29	40.3			
	Wide	40-43	37	51.4			
	Very wide	44-x	5	6.9			
	Total		72	100			
Nasal index (Martin)	Hyperleptorrhine	x-54.9	0	0	x-54.9	0	0
	Leptorrhine	55.0-69.9	4	5.6	55.0-69.9	2	8.3
	Mesorrhine	70.0-84.9	38	52.8	70.0-84.9	16	66.6
	Chamaerhine	85.0-99.9	25	34.7	85.0-99.9	5	20.9
	Hyperchamaerhine	100.0-x	5	6.9	100.0-x	1	4.2
	Total		72	100		24	100
Mouth index (Vallois)	Narrow	x-34.9	9	12.5	x-34.9	4	16.7
	Medium	35.0-44.9	36	50.0	35.0-44.9	9	37.5
	Wide	45.0-x	27	37.5	45.0-x	11	45.8
	Total		72	100		24	100

TABLE 6. Cephalometric measurements and indices of various comparative groups of men from Vietnam

Characteristics	Present study	Olivier G., Moullec J., (1968) (N=49-50)	t test	Wastl J., (1965) (N=62)	t test	Chabouf M., (1967) (N=58)	t test
	$\bar{x} \pm s$	$\bar{x} \pm s$		$\bar{x} \pm s$		$\bar{x} \pm s$	
Head length	191.4 ± 4.96	185.0 ± 5.9	6.282	185.8 ± 6.8	5.367	182.0 ± 6.48	9.100
Head breadth	156.8 ± 5.16	149.5 ± 4.15	8.638	146.9 ± 5.6	10.582	152.9 ± 5.02	3.504
Cephalic index	82.0 ± 3.20	81.2 ± 3.36	1.319	78.6 ± 4.0	5.375	84.1 ± 3.95	5.109
Head height	132.2 ± 9.31	125.0	—	124.7 ± 8.3	4.931	—	—
Head height-length index	69.1 ± 6.51	67.8	—	66.5 ± 4.6	2.697	—	—
Head height-breadth index	84.1 ± 8.24	83.4	—	84.4 ± 5.5	0.251	—	—
Face height	113.9 ± 7.05	116.3 ± 6.56	1.926	118.1 ± 4.6	4.134	111.1 ± 7.19	2.226
Bizygomatic diameter	137.8 ± 7.88	138.4 ± 4.17	0.545	140.4 ± 4.2	2.428	140.1 ± 5.38	1.971
Bigonial diameter	108.4 ± 6.29	—	—	108.4 ± 5.2	0	109.5 ± 4.71	1.140
Morphological facial index	83.1 ± 6.07	84.0 ± 5.56	0.935	83.6 ± 3.9	0.575	—	—
Nose height	47.3 ± 4.53	51.4 ± 3.16	5.887	53.2 ± 3.1	8.886	47.3 ± 3.32	0
Nose breadth	39.7 ± 2.13	38.1 ± 2.13	4.082	38.3 ± 1.7	4.230	39.2 ± 2.89	1.099
Nasal index	84.9 ± 9.32	76.2 ± 6.11	6.227	72.9 ± 6.3	8.830	76.5 ± 7.29	5.765
Mouth width	49.7 ± 3.50	51.9 ± 3.16	3.103	46.3 ± 3.1	5.965	45.7 ± 3.36	6.623
Lips thickness	21.6 ± 3.62	20.4 ± 3.9	1.445	21.6 ± 2.8	0	16.6 ± 3.63	7.813
Mouth index	43.4 ± 7.45	39.0 ± 6.57	3.424	46.7 ± 8.5	2.787	36.5 ± 8.72	4.782

index both men and women had medium wide mouths. The variation of both absolute and relative values in the data compared suggests rather possible deviation due to adaptive or other processes resulting in the differentiation (Table 6).

STATURE (Tables 7, 8, 9)

Stature of men exhibited the mean value of 162.8 cm, the minimum being 152 cm and the maximum 174.5 cm. The distribution of the individual values of stature in categories according to Martin revealed a greater grouping of individuals with small to submedium stature; another major grouping of statures was in the category of over-medium statures. According to the average value the studied men are, of course, submedium tall, but this average — as has been hinted — is not characteristic of all the set (Table 7).

The established average stature of the studied Vietnamese falls by its value towards the upper limit of the variation series of stature averages (157 to 162 cm, see Table 9 and Olivier G., Moullec J., 1968 p. 81) given by different authors for population groups on the territory of Vietnam. Taking into consideration the geographic appurtenance of the Vietnamese studied (aware of the fact that none of the groups being compared is unified in time and none of them being equivalent as for the complex of sociocultural factors) we find substantial differences in the relation to the northern groups of Nungs (162.5 cm), Thos (161.9 cm), Thai-Dams (161.4 cm) and the North Vietnamese proper (161.4 cm) with the exception of the Tonkinese (157.4 cm) studied by von Eicksted. (Note: North Vietnam = Tonking, South Vietnam = Annam.)

Substantial differences were, however, found in comparison with the groups resident in central and southern Vietnam; our men surpassed by their stature the Annamese (161.1 cm, 159.9 cm and 157.2 cm) as well as the Chams (159 cm, 157.7 cm). (In detail see Olivier G. and Moullec J., 1968 p. 80-81.)

Trunk. According to the relative sitting height the men and women appeared macrocormic; from

the distribution of the values in the categories of this index, typical of men is rather metrio- to macrocormy, in women essentially only macrocormy. Relatively long trunks of the Vietnamese were also described by the other authors, the longest being registered by Olivier G. (1968) (54.2 units).

The relatively long trunk in men was combined with medium wide shoulders and hips. In the acromiocrystal index the trunk then appeared as rectangular to intermedian. Also women had a relatively long trunk, medium wide shoulders, and relatively narrow hips. According to the acromiocrystal index they were for the most part rectangular.

The compared values of the Vietnamese fluctuated considerably from group to group. Olivier G. (1968) and Wastl J. (1965) give values near to our values, with the exception of the relative width of the hips, which was greater; this was, of course, projected in our values of the acromiocrystal index, whose values accumulated rather in the intermedian categories.

The average value of the thoracic index 66.6 units in men and 67.4 units in women suggested a medium arched thorax both in men and in women (Table 8).

The upper limb reached on the average 71.7 cm of length in men and 66.5 cm in women; with respect to stature it appeared as medium long in both men and women. The distribution of values of this character in the index categories proved to be quite interesting: the supremacy of long and short upper limbs. Further division into the upper and the lower arms suggested the prevalence of relatively short upper arms and relatively short lower arms both in men and in women.

According to the mean value of the length-width index ($M 52: (M 10-11) \times 100$) of the hand men had a medium wide hand (43.3 units), women a narrow hand (42.2 units).

The skeletal substrate of the upper limb, whose structure can be estimated from the bicondylar width of the lower arm bones and the width of the wrist, was well developed in the men and women examined, only exceptionally it was developed robustly or gently.

The lower limb. The length of the lower limb

TABLE 7. Somatometric measurements and indices in men and women

Characteristics	Men			Women			t test
	N	\bar{x}	s	N	\bar{x}	s	
Stature	72	1628.1	49.52	24	1525.5	64.08	8.053
Height of tragon	72	1495.2	49.21	24	1391.8	58.20	8.416
Height of acromion	72	1323.0	48.56	24	1227.8	54.70	7.964
Height of radiale	72	1014.4	37.46	24	951.1	42.70	6.848
Height of stylium	72	783.5	32.04	24	731.3	34.17	6.723
Height of dactylon	72	601.24	34.25	24	562.4	29.61	4.921
Suprasternal height	72	1317.4	45.78	24	1223.0	51.39	8.266
Height of iliospinale	72	901.4	38.53	24	848.4	41.42	5.666
Height of tibiale	72	446.9	22.01	24	413.3	26.18	6.106
Height of sphyrion	72	80.7	6.99	24	61.7	6.33	11.682
Sitting height	72	867.6	32.57	22	815.4	35.2	6.390
Relative sitting height	72	53.3	1.45	22	53.4	1.46	0.282
Biacromial diameter	72	366.1	18.29	24	336.0	16.17	7.088
Relative biacromial diameter	72	22.4	1.14	24	22.1	0.88	1.339
Transversal chest	71	264.7	14.42	24	232.8	12.37	9.611
Relative transverse chest	71	16.2	0.78	24	15.3	0.81	4.702
Antero-posterior chest	71	175.9	11.59	24	156.9	12.94	6.683
Relative antero-posterior chest	71	10.8	0.76	24	10.3	0.72	2.907
Thoracal index	70	66.6	4.45	24	67.4	4.40	0.766
Bilioecristal diameter	72	281.9	20.42	24	265.7	16.12	3.513
Relative bilioecristal diameter	72	17.3	1.08	24	17.3	1.05	0
Acromiocrystal index	72	77.3	5.95	24	78.8	4.81	1.243
Total arm length	72	717.8	39.09	24	665.4	35.33	5.763
Relative total arm length	72	44.4	2.20	24	43.7	1.35	1.852
Upper arm length	72	307.8	22.05	24	276.7	25.60	5.675
Relative upper arm length	72	18.9	1.48	24	18.1	1.41	2.381
Forearm length	72	230.2	22.11	24	216.6	17.05	2.718
Relative forearm length	72	14.3	1.48	24	14.2	0.80	0.420
Hand length (10-11)	72	182.1	22.52	24	169.5	12.48	3.426
Relative hand length	72	11.2	1.35	24	11.1	0.80	0.439
Bicondylar humerus	72	63.5	4.23	24	55.2	3.47	8.608
Wrist breadth	72	52.0	2.59	24	47.9	2.72	6.591
Hand breadth	72	79.3	4.08	24	71.0	4.33	8.361
Hand index	65	43.4	4.82	23	42.2	2.82	1.430
Total leg length (53)	72	869.8	38.46	24	822.6	28.04	5.250
Relative total leg length (13: 1)	72	55.4	1.33	24	55.6	1.61	0.548
Thigh length	72	456.2	33.85	24	434.3	28.31	3.119
Relative thigh length	72	30.0	1.85	24	28.0	2.42	3.704
Length of lower leg	72	36.45	24.79	24	351.8	24.00	2.227
Relative length of lower leg	72	22.3	1.28	24	22.0	1.20	2.431
Femorotibial index	72	80.5	9.27	24	81.3	7.60	0.422
Foot length	72	241.3	8.47	24	222.8	11.12	7.983
Relative foot length	72	14.8	0.41	24	14.7	0.45	0.962
Bicondylar femur	72	87.7	4.24	24	80.7	4.18	6.997
Ankle breadth	72	69.3	5.32	24	62.0	6.00	5.567
Intermembranal index I	72	82.5	4.55	24	80.9	3.30	1.858
Neck circumference	70	351.0	15.90	23	304.0	15.00	12.842
Chest circumference	72	846.0	40.20	—	—	—	—
Relative chest circumference	72	51.9	2.37	—	—	—	—
Upper arm circumference (rel.)	72	262.2	20.99	24	227.0	17.52	7.336
Upper arm circumference (contr.)	72	287.2	22.48	24	244.2	17.61	8.458
Thigh circumference	72	491.7	29.39	23	491.5	39.96	0.027
Calf circumference (relaxed)	72	344.8	18.85	24	319.8	21.24	5.384
Weight	72	53.9	5.03	24	44.8	5.42	7.251
Triceps skinfold	72	9.5	5.08	24	16.0	5.04	5.458
Subscapular skinfold	72	11.1	4.00	24	14.3	3.02	4.129
Suprailiac skinfold	72	11.0	4.26	23	13.8	4.11	2.820
Manouvrier's index	72	87.8	4.97	22	87.4	5.26	0.316
Rohrer's index	72	1.25	0.115	24	1.24	0.094	0.426
Vital capacity (VC)	72	32.2	4.82	23	19.4	4.23	11.272
Grip strength (right hand)	72	42.9	6.14	24	26.9	5.07	11.409
Grip strength (left hand)	72	39.6	6.06	24	26.5	5.45	9.303

(M 53) in men was 86.9 cm, in women 82.2 cm. The relative length of the lower limb (M 13: M 1) exhibited on the average 55.4 units in men and 55.6 units in women. According to these values both men and women appeared as macroscelic to which also cor-

responded the distribution of values in the respective categories of this index.

The thigh length in men reached on the average 45.6 cm, in women only 43.4 cm. According to the values of relative lengths men had on the average

TABLE 8. Distribution of somatometric measurements and indices into quantitative categories

Characteristic	Category	Limits of the categories					
		Men			Women		
Stature (Martin)	Very low	130.0-149.9	0	0	121.0-139.9	1	4.2
	Low	150.0-159.9	22	30.6	140.0-148.9	7	29.1
	Below average	160.0-163.9	22	30.6	149.0-152.9	4	16.7
	Average	164.0-166.9	8	11.1	153.0-155.9	3	12.5
	Above average	167.0-169.9	16	22.2	156.0-158.9	7	29.1
	Tall	170.0-179.9	4	5.5	159.0-167.9	1	4.2
	Very tall	180.0-199.0	0	0	168.0-186.9	1	4.2
	Total		72	100		24	100
Relative sitting height (Men-Vallois, Women - Brugsch)	Brachycormic	x-50.9	2	2.8	x-51.4	1	4.5
	Metriocormic	51.0-52.9	31	43.0	51.5-52.0	2	9.1
	Macroecormic	53.0-x	39	54.2	52.1-x	19	86.4
	Total		72	100		22	100
Relative biacromial diameter (Brugsch)	Narrow	x-22.0	24	33.3	x-21.5	6	25.0
	Medium	22.1-23.0	26	36.1	21.6-22.5	10	41.7
	Wide	23.1-x	22	30.6	22.6-x	8	33.3
	Total		72	100		24	100
Relative bilioecristal diameter (Brugsch)	Narrow	x-16.5	15	20.8	x-17.5	13	54.2
	Medium	16.6-17.5	31	43.1	17.6-18.5	9	37.5
	Wide	17.6-x	26	36.1	18.6-x	2	8.3
	Total		72	100		24	100
Acromiocrystal index (Vallois)	Trapeziform	x-69.9	5	6.9	x-69.9	1	4.2
	Intermediate	70.0-74.9	24	33.3	70.0-74.3	2	8.3
	Rectangular	75.0-x	43	59.8	75.0-x	21	87.5
	Total		72	100		24	100
Relative total arm length (Brugsch)	Short	x-44.0	33	45.8	x-43.5	12	50.0
	Medium	44.1-44.5	8	11.1	43.6-44.0	3	12.5
	Long	44.6-x	31	43.1	44.1-x	9	37.5
	Total		72	100		24	100
Relative upper arm length (Olivier)	Short	x-18.9	33	54.2	x-18.9	21	87.5
	Medium	19.0-19.9	18	25.0	19.0-19.9	2	8.3
	Long	20.0-x	15	20.8	20.0-x	1	42.2
	Total		72	100		24	100
Relative forearm length (Olivier)	Short	x-14.9	54	75.0	x-14.9	20	83.3
	Medium	15.0-15.9	12	16.7	15.0-15.9	4	16.7
	Long	16.0-x	6	8.3	16.0-x	0	0
	Total		72	100		24	100
Relative total leg length (Brugsch)	Brachyscelic	x-53.5	4	5.6	x-54.0	2	8.3
	Metrioscelic	53.6-54.0	7	9.7	54.1-54.5	4	16.7
	Macrosclie	54.1-x	61	84.3	54.6-x	18	75.0
	Total		72	100		24	100
Relative thigh length (Olivier)	Short	x-28.9	52	72.2	x-28.9	16	66.6
	Medium	29.0-29.9	12	16.7	29.0-29.8	4	16.7
	Long	30.0-x	8	11.1	30.0-x	4	16.7
	Total		72	100		24	100
Relative length of lower leg (Olivier)	Short	x-21.9	24	33.3	x-21.9	5	20.8
	Medium	22.0-23.9	45	62.5	22.0-23.9	14	58.4
	Long	24.0-x	3	4.2	24.0-x	5	20.8
	Total		72	100		24	100
Relative chest circumference (Olivier)	Narrow	x-50.9	21	29.2	—	—	—
	Medium	51.0-55.9	48	66.6	—	—	—
	Wide	56.0-x	3	4.2	—	—	—
	Total		72	100		—	—
Manouvrier's index (Martin)	Hyperbrachyscelic	x-74.9	1	1.4	x-74.9	0	0
	Brachyscelic	75.0-79.9	3	4.2	75.0-79.9	0	0
	Subbrachyscelic	80.0-84.9	17	23.6	80.0-84.9	8	36.4
	Mesatisclie	85.0-89.9	24	33.3	85.0-89.9	7	31.8
	Submacrosclie	90.0-94.9	24	33.3	90.0-94.9	6	27.3
	Macrosclie	95.0-99.9	3	4.2	95.0-99.9	0	0
	Hypermacrosclie	100.0-x	0	0	100.0-x	1	4.5
	Total		72	100		22	100
Rohrer's index (Pignet)	Very feeble	x-1.12	12	16.7	x-1.12	5	20.8
	Feeble	1.13-1.19	11	15.3	1.13-1.19	1	4.2
	Medium	1.20-1.25	16	22.2	1.20-1.25	6	25.0
	Good	1.26-1.32	14	19.4	1.26-1.32	8	33.3
	Strong	1.33-1.39	10	13.9	1.33-1.39	4	16.7
	Very strong	1.40-x	9	12.5	1.40-x	0	0
	Total		72	100		24	100

TABLE 9. Somatometric measurements and indices of various comparative groups of men from Vietnam

Characteristic	Present study	Olivier G., Moullec J., (1968) (N=49-50)	t test	Wastl J., (1965) (N=62)	t test	Chabeuf M., (1967) (N=58)	t test	Nguyen-Quang-Quyen et Do-Nhu-Cuong (1972) (N=955)	t test
	$\bar{x} \pm s$	$\bar{x} \pm s$		$\bar{x} \pm s$		$\bar{x} \pm s$		$\bar{x} \pm s$	
Stature	1628.1 ± 49.52	1572.9 ± 58.1	5.476	1602 ± 51	3.058	1614.5 ± 57.8	1.421	1584 ± 54	7.222
Height of tragon	1495.2 ± 49.21	—	—	1473 ± 49	2.650	—	—	—	—
Height of acromion	1323.0 ± 48.56	1270.0 ± 50.4	5.766	1295 ± 46	3.504	—	—	—	—
Height of radiale	1014.4 ± 37.46	—	—	990 ± 36	3.866	—	—	—	—
Height of stylium	783.5 ± 32.04	—	—	751 ± 26	6.709	—	—	—	—
Height of dactylium	601.2 ± 34.25	—	—	579 ± 21	4.610	—	—	—	—
Suprasternal height	1317.4 ± 45.78	1268.1 ± 49.1	5.609	1288 ± 44	3.823	—	—	—	—
Height of illospinalis	901.4 ± 38.53	854.1 ± 38.2	6.700	911 ± 43	1.447	—	—	—	—
Height of tibiale	446.9 ± 22.1	—	—	422 ± 17	7.546	—	—	—	—
Height of sphyrion	80.7 ± 6.99	—	—	74 ± 7.2	5.833	—	—	—	—
Sitting height	867.6 ± 32.57	852.5 ± 32.9	2.504	845 ± 28	4.489	860.7 ± 35.8	1.170	822 ± 30	12.12
Relative sitting height	53.3 ± 1.45	54.2 ± 1.06	3.965	52.6 ± 0.7	3.666	53.3 ± 1.51	0	—	—
Biacromial diameter	366.1 ± 18.29	368.2 ± 18.70	0.724	366 ± 9	0	373.1 ± 18.9	2.130	355 ± 20	4.881
Relative biacromial diameter	22.4 ± 1.14	23.4 ± 0.73	5.917	22.6 ± 0.2	1.469	—	—	263 ± 30	1.017
Transverse chest	264.7 ± 14.42	—	—	—	—	—	—	172 ± 48	1.928
Antero-posterior chest	175.9 ± 11.59	177.1 ± 1.97	0.867	—	—	—	—	250 ± 14	13.065
Biliostristal diameter	281.9 ± 20.42	260.7 ± 12.53	7.093	255 ± 8	10.404	269.5 ± 14.7	4.020	—	—
Acromiocristal index	17.3 ± 1.08	16.6 ± 0.69	4.375	15.7 ± 0.2	12.379	—	—	—	—
Total arm length	77.3 ± 5.95	70.6 ± 3.66	7.683	—	—	72.1 ± 3.87	6.007	—	—
Relative total arm length	717.8 ± 39.09	699.6 ± 26.9	3.046	712 ± 28	1.049	719.9 ± 30.5	0.344	—	—
Upper arm length	44.4 ± 2.20	44.4 ± 0.80	0	44.4 ± 1.4	0	—	—	—	—
Relative upper arm length	307.8 ± 22.05	295.9 ± 14.9	3.556	301 ± 14	2.254	—	—	—	—
Forearm length	18.9 ± 1.48	18.8 ± 0.54	0.526	18.8 ± 0.7	0.516	—	—	—	—
Relative forearm length	230.2 ± 22.11	237.5 ± 10.9	2.411	241 ± 14	3.595	—	—	—	—
Hand length (10-11)	14.3 ± 1.48	15.1 ± 0.44	4.324	15.0 ± 0.4	3.878	—	—	—	—
Hand breadth	182.1 ± 22.52	—	—	173.0 ± 2.0	3.377	—	—	—	—
Total leg length (13)	79.3 ± 4.03	80.6 ± 3.36	1.923	87.3 ± 7.3	7.463	—	—	—	—
Relative total leg length	901.4 ± 38.53	854.1 ± 38.2	6.702	—	—	—	—	—	—
Thigh length	55.4 ± 1.39	54.3 ± 1.04	5.116	—	—	—	—	—	—
Relative thigh length	456.2 ± 38.85	445.4 ± 22.0	2.185	—	—	—	—	—	—
Length of lower leg	30.3 ± 1.85	28.3 ± 0.77	6.967	—	—	—	—	—	—
Relative length of lower leg	364.5 ± 24.79	344.9 ± 19.54	2.014	353 ± 20	3.161	—	—	—	—
Femorotibial index	22.3 ± 1.28	22.0 ± 0.82	1.579	22.0 ± 0.2	1.962	—	—	—	—
Foot length	80.5 ± 9.27	77.6 ± 3.50	2.417	—	—	—	—	—	—
Relative foot length	241.3 ± 8.47	238.8 ± 9.52	1.492	244.1 ± 4.6	2.449	—	—	—	—
Neck circumference	14.8 ± 0.41	15.2 ± 0.38	5.556	14.6 ± 0.8	1.848	—	—	—	—
Chest circumference	351.0 ± 15.90	—	—	—	—	—	—	314 ± 15	18.869
Relative chest circumference	846.0 ± 40.20	830.5 ± 32.9	2.334	—	—	808.8 ± 53.4	4.397	747 ± 28	20.523
Upper arm circumference (rel.)	51.9 ± 2.37	52.7 ± 2.12	1.950	—	—	—	—	—	—
Upper arm circumference (contr.)	262.2 ± 20.99	—	—	—	—	—	—	229 ± 16	13.056
Thigh circumference	287.2 ± 22.48	—	—	—	—	—	—	252 ± 19	12.870
Calf circumference	491.7 ± 29.39	—	—	—	—	—	—	394 ± 30	27.241
Weight	344.8 ± 18.85	—	—	—	—	—	—	309 ± 19	15.833
Vital capacity	53.8 ± 5.03	49.2 ± 4.98	5.109	53.0 ± 4.1	1.163	51.8 ± 7.48	1.831	45.2 ± 3.4	15.815
	3.2 ± 0.48	—	—	—	—	—	—	3.4 ± 0.45	0.352

medium long and long thighs, women relatively short ones. Lower legs in men appeared absolutely longer (36.4 cm) than the lower legs in women (35.1 cm). In relative values, however, it was vice versa, although the two values fell into the category of medium long lower legs. According to the femorotibial index the lower limbs of men and women appeared proportional without any major hint of sex differences. The foot of the examined group measured on the average 24.1 cm in men and 22.3 cm in women. With respect to stature it was medium long. Like the upper limb, the whole lower limb of the examined men and women appeared as medium robust in the picture of the bicondylar width of the ankle width of the lower leg bones.

Absolute and relative parameters of the lower limb of Vietnamese men and women correspond approximately to those found by Olivier G. (1968) and Wastl J. (1965) in Vietnam and in the whole of the former Indochina (Table 9).

Circumferential dimensions. The circumference of the neck in men was 35.1 cm, i.e. more than was found in the Vietnamese by Nguyen-Quang-Quyen and Do-Nhu-Cuong (1972); the neck circumference

of Vietnamese women (30.4 cm) was, of course, substantially lower. The absolute and the relative circumference of the chest in men suggested a medium to small development of the upper part of the trunk which — judging from the data compared — is typical of the Vietnamese. As for the circumference of the upper arm, the thigh and the calf, the muscles on the two limbs were developed appropriately; in comparison with data by Nguyen-Quang-Quyen and Do-Nhu-Cuong (1972) of course to a greater extent.

Constitutional indices. The physical characteristics of the human body also includes the constitution. For determining it some body parameters are used, particularly body weight, thickness of subcutaneous fat, the Manouvrier and the Rohrer indices of robusticity. The values obtained in Vietnamese men and women are given in Table 7.

The weight of Vietnamese men was on the average 53.9 kg, of women only 44.8 kg. In comparison with data by other authors these are so far the highest values, the differences between our data and those compared were as much as 8.6 kg!

The thickness of subcutaneous fat followed on

the upper arm, below the scapula and on the hip in men and women was most developed on the hip and below the scapula, least above the triceps.

According to Manouvrier's index the examined men appeared on the average as mesatiscelic, i.e. their trunk was long in comparison with the limbs. From the distribution of the values in the categories of this index there follows, however, that besides mesatiscelic individuals there also occurred a large number of submacroscelic and subbrachyscelic individuals in our set. A similar distribution of Manouvrier's index was also found in Vietnamese women.

The Rohrer index by means of which the corpulence is expressed on the basis of stature and weight, reached in men on the average 1.25 units and in women 1.24 units. The stature of men and women in the picture of the average values of this index appeared as medium thick, i.e. medium corpulent.

With respect to the constitution type the vital capacity of men's lungs (3.2 l) appeared relatively high, in women (1.9 l) however, small.

Grip strength was adequate to the development of the muscle tissue of the upper limb.

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