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Anthropological results concerning the ethnogenesis of Hungarians

By

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Abstract: Investigations of widest range have been carried out by author during the last 20 years concerning the problems of ethnogenesis of Hungarians. Paper summarizes the obtained results from the fields of somatology, paleoanthropology and ethnic odontology. With 6 tables and 8 figures.

Somatological data were taken in widest range by author during the last twenty years from nine ethnogeographical groups of Hungarians (inhabiting 28 localities) as well as from some ethnic groups of the Soviet Union (Bashkirs, Kazakhs, Uzbeks and Ossets). He analysed further some taxonomicaly important odontoscopical traits of the above mentioned groups of Hungarians. At last he studied the brachycephalization and gracilization on apporx. 300 craniological series originating from different zones of continental Eurasia for clarifying the ethnogenetical processes passed off in the Carpathian Basin (TÓTH 1973, 1974a, b, 1977, 1979a, b, 1980). The somatoscopical and somatometrical data were sampled from more than 4000 men (aged 20-40 years). The differences existing between the studied Hungarian groups and some populations inhabiting the territory of Ural and Central Asia find a reliable expression in the applied combinational polygons (Table 1, Fig. 1-3). On the eight radius of the polygons the values of following traits are plotted: somatoscopical index, percentage of dark hair-colour and that of mixed eye-colour, extension of beard, chest-hair, bizygomatic breadth (139-148 mm), morphological facial height (125-134 mm) and cephalic index (77.0-86.0). It should be mentioned that the somatoscopical index applied formerly by DEBETS (1968) and MARK (1970) expresses a comprehensive information about the Mongoloid and Europoid components, in so far as it contains ten morphoscopical and pigmentation traits (extension of beard, extension of chest-hair, frequency of epicanthus, development of proximal part of upper eyelid-plica, eye-slant, horizontal facial profile, prominence of cheekbones, nasal root height, upper lip profile and prominence of genial tubercle). It can be ascertained that according to the main somatoscopical and somatometric characters of all ethnogeographic groups of the Hungarian men are quite different from those of the Bashkirs, Kazakhs and Uzbeks. There are well expressed differences in the major part of 14 cephalometric characters revealed not only by the combinational polygons, but by the results of Student's probability test. A comparative analysis of 28 local groups of Hungarian men resulted in the setting of three territorial (southwestern, northwestern and central) somatomorphological complexes as well as in the Central Danubian variant being composed of the three main complexes. The Central Danubian variant can be characterized by following features: dominancy of dark hair-colour and mixed eye-colour, middle extension of beard, relatively weakly developed chest-hair, straight nasal bridge, hyperbrachycephaly, mesoprosopy, leptorrhiny and medium tall stature.

According to a great number of their characters the ethnogeographical groups of Hungarian men seem to by very close to the southern Ossets from the Caucasus. It is worth value the nearly complete absence of the Mongoloid component in the Central-Danubian variant of the Carpathian anthropological zone (for the whole population is its frequency below one percent). It must

be admitted that in some individual cases an epicanthus or a strong arch of cheekbones may be present: in one of the ethnogeographical groups of the central somatomorphological complex (living in the territory of Nagykunság) among 388 individuals only 2-3 persons have been found with a well developed epicanthus. Moreover the broad face of the Europoid Ossets and the Kazakh-Kiptshaks having a high Mongoloid component convincingly demonstrates the unsuitability of the bizygomatic values for separating the Europoid and Mongoloid components. In the Central-Danubian variant the facial breadth is growing according to a West-East trend. Wide ranging comparative analysis led to the assumption of heterochrony of the social and morphogenetical processes; this fact finds its convincing expression in the disagreement of the three territorial somatomorphological complexes and the dialect areas of the Hungarians (Fig. 4). On the basis of the pigmentation characters (hair- and eye-colour) and the development of medial part of upper eyelid-plica seem the northern and southern subcontinental components of the Europoid race nearly equal participated in the anthropological composition of Hungarian men. That means that in the formation of the three somatomorphological complexes as well as in that of the Central-Danubian variant as morphological components both massive and gracilic ones took part.

Concerning the ethnic odontology we should like to mention the morphoscopical traits of the lingual surface of the upper medial incisors (average point 0-3). A clear dominancy of the values (0-1) characterizing Europoids could be established in more than 2000 individuals from the ethnogeographic groups of Hungarian men. The frequency of the shovel shaped type characteristic for Mongoloids is relatively low and the Hungarian contingent seems to be very far not only from the Mongoloid groups, but from the Europomongoloid mixed Kazakhs, too (Table 2). It is well know that the summarized percentage value of the shovel shaped forms (2+3) of the upper medial incisors varies between 0 and 15 in the Europoid populations (ZUBOV 1968), whereas in Mongoloid ones the highest frequency of shovel-shaped incisors (75-100%) has been found. The odontoscopical values characterizing the mixed groups from the zone of the Ural Mountains and Central Asia, i.e. East-Finns, Ugors, Kazakhs and Uzbeks have an intermediary position between the above mentioned extremes (Table 2). Nevertheless the frequency of shovel-shaped incisors is very high in the dental system of many people of India (Oraons, Munda, Santals) belonging to the Europoid area (Table 2). It can not be left without consideration that the odonto-anthropological traits of the southern subcontinental area of the Europod racial stock (Tadjiks, Azherbaidjans, Daghestans) has a similarity to the Hungarian contingent (Table 2). Analysing the ethnogenesis of Hungarians we have to take into consideration not only the Europo-Mongoloid odontological characteristics, but those of the Southern-Europoids, too. All of them have their parallelism in the somatological sphere.

For clarifying the ethnogenesis of Hungarian people and the development of the Central-Danubian variant a comparative analysis of the main taxonomical components has been carried out using the data from nearly 200 craniological series originating from Eurasia (53 series of these are from Hungary's territory) (TÓTH 1974a, 1977). The morphogenetical processes passed off in the Carpathian Basin during the last two millennia have been determined by the historically autochtonous as well as immigrant populations (included the conquering Hungarians, too). For the anthropological composition of the conquering Hungarians the dominancy of the complex of the Europoid traits seem to be characteristic (on the basis of the osteological remains from 42 localities - calculated as a group-mean). The analysis had to suit the requirement that racial-types are not determined by single traits, but by the complex of a great number of traits and the racial characters find their expressions most clearly in the entirety of a given population and not in its individuals (it does not mean any refusal of the visual-typological method). According to the main morphological traits of the neuro- and splanchnocranium (Table 3) the osteological remains from conquering Hungarians are significantly different from those of the West-Siberian, Kama and South-Uralian groups as well as from the series of Bolshe-Tarchan, Tankeiewka and from Kazakhstan Turks. On the contrary a well-expressed similarity can be observed between series from conquering Hungarians and those from the Northern-Caspic, Sauromats and Sarmatas. Wide ranging comparisons make possible the establishment of a broad-faced, massive North-Caspic variant of the Eastern-Protoeuropoids; this variant existed from the Early Iron-Age (Scytha-Saka Period) till the beginning of the Medieval Epoch in the morphological composition of different historical populations (included the conquering Hungarians, too). The Sauro-Sarmatic analogies find their expressions not only in the values of the two combinated indices (Table 3), but in the nearness of the craniometrical mean (Table 4). The anthropological composition of the relatively gracilized autochtonous populations settled the Carpathian Basin had been modified by the conquering Hungarians. This

process can be followed from the Arpadian Age up to the present (Table 5-6). Brachycephalization as a process is well-expressed in the Central Danubian Basin from La Tène up to our days. The average values characterizing the female series are in all of the periods higher than those from male ones. Brachycephalization was the most intensive during the final period of the Medieval Epoch (Table 5-6). In the Central Danubian Basin the massive North-Caspian variant had been absorbed considerably by the aboriginal populations (Fig. 5), but especially in central somatomorphological complex of the Hungarians it survives up to the present (considering the effects of a heterosis as negligible). The craniomorphological analogies between conquering Hungarians and Sauro-Sarmatians reinforce the hypothesis that some groups of Protougors infiltrated the ethnic millieu of the northern zone of the Caspian See already in the first millennium B.C. (Fig. 6). One part of this neometallic millieu may be identified with the Proto-Hungarians who developed during the Early Prochorovean phase in the history of Sarmatians. These hypothetical Proto-Hungarians separated themselves anthropologically from the Finnish-Ugors of the South-Uralian region as well as from the West-Siberian Protougor tribes. Taking futher in account that the area of the massive, broad-faced Protoeuropoid component was very extensive during the last two millennia B.C. (between Lower-Volga and Minussinsk Basin); on the basis of the reciprocal population-connections caused by the tribal confederations the Srubno-andronovean Europoids can be partly regarded as Protougors (TÓTH 1974a, 1977, 1979b) (Fig. 7).

The blending of the two components, i.e. that of the massive one with broad face and that of the gracilized with narrow face took place in the Central Danubian Basin during our millennium. It was the process that resulted in the formation of the Central Danubian variant. The blending finds its clear expression in the ethnogeographic groups of living Hungarians. According to the topography of the cranial-index and bizygomatic breadth conquering Hungarians and some groups of the central somatological complex (Nagykunság, South-Palócság, Taktaköz) are very near each other. The other somatological groups are much closer to the conquering Hungarians than to the summarized series from the Medieval Epoch and Modern Times. The above explained analogies prove the determining role of the anthropological composition of conquering Hungarians in the racial- and ethnogenesis of the contemporary population of Central Danubian Region (Fig. 8).

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Table 1. Averages and frequency of some principal somatological characters (men)

Ethnic groups \ Characteristics	Index of Mongoloidity (Over 20)	% of dark hair colour	% of mixed eye colour	Extension of beard average point, 1-5	Extension of chest hair average point, 1-5	Bizygomatic breadth (mm)	Morph. facial height (mm)	Cephalic index
South-West, Őrség ** (115)	9.20	82	33	2.68	2.63	143.3	128.6	84.8
South-West, Göcsej (634)	18.57	71	40	2.65	2.25	143.7	127.2	84.4
North-West, Rábaköz (247)	7.14	71	64	2.98	2.19	141.9	125.3	82.9
Tisza-Basin, Kunság (387)	12.27	77	49	2.76	2.28	144.4	126.2	84.0
Tisza-Basin, Jászság (337)	17.45	71	54	2.41	2.18	143.5	125.8	83.6
South-Palócság (with Mátyó) (291)	9.94	79	61	2.84	2.10	144.6	125.9	84,2
North-East Palócság (540)	13.88	71	56	2.94	2.00	143.7	124.7	83.8
North-Hungary, Taktaköz (448)	12.18	74	55	2.71	1.90	144.3	125.0	84.3
North-East Hungary (Szamos-hát) (311)	10.80	69	52	2.75	2.14	143.5	125.6	85.2
Central-Danubian variant (3310)	13.41	73	52	2.74	2.14	143.7	125.9	84.1
Kiptshak (Kazahstan) (106)	60.60	100	22	1.56	1.03	150.4	133.3	83.8
Southern Ossetians (100)	-2.57	98	61	3.76	3.22	149.2	131.1	84.5
Yurmata (Bashkirs) (95)	28.52	84	35	2.84	1.46	142.6	128.5	79.4
Yenei (Bashkirs) (92)	31.95	87	51	2.79	1.45	140.9	128.0	77.4
Min-Yaik (Bashkirs) (95)	33.51	92	32	2.44	1.35	143.5	130.3	78.9
Kese-Tabuen (Bashkirs) (104)	28.97	93	38	2.23	1.36	144.3	130.5	79.9
Usergan (Bashkirs) (97)	32.44	97	34	2.54	1.34	146.1	132.6	81.6
Uisuns (Kazahstan) (100)	56.88	100	13	2.28	1.13	147.3	132.2	83.5
Madiar (Kazahstan) (80)	63.80	98	22	1.81	1.05	148.7	132.5	84.7
Arguen (Kazahstan) (78)	52.42	100	12	1.77	1.07	149.4	132.8	84.1
Madzhars (Uzbekhistan) (77)	53.36	97	18	1.92	1.38	146.3	131.2	83.1
Asia (Uzbekhistan) (60)	51.75	100	10	2.10	1.41	148.5	132.2	84.1

** Number of individuals

Table 2. Some comparative data of shovel-shaped incisors in different ethnic groups (males)

Dental Traits / Groups, authors, years	Medial incisors (2+3)		Lateral incisors (2+3)	
	%	N	%	N
Mongols (Mongolia; ZOLOTARYEVA; ZUBOV 1973)	90.4	273	98.6	286
Kazahs (ZUBOV 1973)	62.6	131	56.5	131
Oraons (East-India; ZUBOV 1973)	58.4	65	48.4	64
Munda (East-India; ZUBOV 1973)	56.4	39	56.4	39
Santals (East-India; ZUBOV 1973)	57.0	72	47.2	72
Meadow Mari (ZUBOV 1973)	21.8	110	34.4	110
Komi-Zyrians (southerns; AKSIANOVA 1979)	20.2	79	37.7	77
Khantis (northerns, DAVIDOVA; AKSIANOVA 1979)	54.8	62	69.1	55
Mansis (northerns, DAVIDOVA; AKSIANOVA 1979)	52.5	162	75.8	149
Osset-Digors (DIATSHENKO; ZUBOV 1973)	8.7	103	20.2	103
Lezghin-Samours (Daghestan; GHADZHIYEV 1979)	25.3	79	24.1	79
Azherbaidjans (Shamhor; GHASHIMOVA 1979)	22.0	?	-	-
Tadjiks (Ghantshi; ZUBOV et al. 1979)	27.4	113	27.7	119
Tadjiks (summarized; ZUBOV et al. 1979)	15.9	910	22.5	915
Uzbekhs (summarized; ZUBOV et al. 1979)	23.1	501	35.2	492
Hungarians (summarized; TŐTH 1977)	17.8	2219	31.1	2060

Table 3. Some comparative indices of the neuro- and splanchnocranium (males and females together)

Characteristics / Ethnic groups	N	Preauricular facio-cerebral index	Facial flatness index
Hungarians, 10.c.AD. (TÓTH 1968, 1974a,b)	122	91.5	17.0
Sauromats, Lower Volga, Cis-Ural 7-4.BC., summarized (FIRSHTEIN 1970)	41	92.0	18.1
Sarmats, Volgograd-Astrahan groups 4.c.BC-4.c.AD. (FIRSHTEIN 1970)	122	91.9	19.6
Sarmats, Saratov region 4.c.BC-4.c.AD. (FIRSHTEIN 1970)	160	91.8	10.7
Sarmats, Cis-Ural, 4.c.BC-2.c.AD., summarized (FIRSHTEIN 1970)	54	92.6	19.0
Tankeyevka, 9-11.c. (AKIMOVA 1977)	68	90.6	31.6
Bolshe-Tarchan, 8-9.c. (TÓTH 1968, 1974a)	62	90.9	38.3
Lugovo, 8-3.c.BC. (TROFIMOVA 1968, TÓTH 1974a)	23	93.4	55.3
Pianobor-cult., 2.c.BC-3.c.AD. (AKIMOVA 1961a, TÓTH 1968, 1974a)	24	90.3	35.3
Masunino-cult., 3-7.c.AD (AKIMOVA 1961b, TÓTH 1968, 1974a)	18	90.7	36.5
Late Lomovatovo Period, 6-8.c.AD. (AKIMOVA 1968, TÓTH 1973, 1974a)	13	90.7	45.5
Birsk, Early Period, 3-4.c.AD. (AKIMOVA 1968, TÓTH 1974a)	18	91.0	42.4
Birsk, Late Period, 5-7.c.AD. (AKIMOVA 1968, TÓTH 1974a)	39	91.3	34.5
Central Ob, 11-8.c.BC. (DREMOV 1967, TÓTH 1974a)	15	94.8	34.7
Central Ob, 7-10.c.AD. (ROZOV & DREMOV 1966, TÓTH 1974a)	35	93.6	59.6
Turks, Kazahstan, 6-12.c.AD. (ISMAGULOV 1965, TÓTH 1974a)	78	94.4	40.1
Europoids, Medieval Epoch, SU (DEBETS 1961, TÓTH 1973, 1974a)	1771	89.9	10.6
Mongoloids, Medieval Epoch, Su (DEBETS, 1961, TÓTH 1973, 1974a)	94	98.2	87.7
Europo-Mongoloids, Scythian Per., SU (DEBETS 1961, TÓTH 1973, 1974a)	146	93.2	41.3

Table 4. Some comparative data of the neuro- and splanchnocranium (males)

Group, type, author, year / Characteristics	Sheyhantaur, 18-19.c.AD.		Andronovo-Bronze age		Lower Volga, Cis-Ural		Hungarians 10.c.AD.
	Central-Asiatic Interfluvial	Andronovo type	Kazahstan summarized	Minoussinsk Basin summarized	Sauromats 7-4.BC. summarized	Sarmatian 4.c.BC-4.c.AD summarized	
	GHINSBOURG, 1963		ALEXEYEV, 1967		FIRSHTEIN, 1970		
Upper facial height	72.2(24)	70.7(24)	69.1(21)	67.8(21)	71.3(25)	71.1(178)	72.5(64)
Bizygomatic breadth	132.7(24)	137.6(24)	136.6(20)	140.7(20)	138.0(24)	137.7(170)	138.4(57)
Upper facial index	54.5(24)	51.4(24)	48.3(20)	48.7(20)	51.7 ··	51.6 ··	52.4 ··
Zygomaxillar angle	130.3(24)	131.6(24)	125.1(14)	127.7(18)	129.5(18)	130.8(145)	128.1(60)
Nasalspine angle	27.0(24)	25.8(24)	31.6(15)	33.7(18)	31.5(18)	30.7(142)	29.1(51)
Orbital index (mf)	87.6(24)·	83.6(24)	74.4 ··	70.9(19)	77.3 ··	76.1(172)	78.2 ··
Frontal angle	88.0(24)	85.7(24)	86.1(12)	83.3(16)	80.8(22)	81.7(151)	82.7(51)
Nasal index	-	-	49.3 ··	51.7(20)	48.5 ··	48.1 ··	48.7 ··
Maximum cranial length	-	-	186.4(25)	186.0(22)	184.2(24)	183.6(181)	183.2(51)
Maximum cranial breadth	-	-	140.4(25)	145.0(22)	145.3(25)	146.2(178)	147.5(61)
Cranial index	85.9(24)	83.9(24)	75.4(26)	78.0(22)	78.9 ··	79.7(178)	80.5 ··

·· Calculated after mean-values by FIRSHTEIN and TÓTH.

· From dacryon - GHINSBOURGH

Table 5. Some craniometrical data from Central Danubian Basin (males)

Characteristics / MARTIN's numbers / Epochal groups	8:1	45	48
Neolith (Kisköre-Gát)	71.9 (3)	134.0 (1)	72.0 (1)
Aeneolith, Baden-culture (Hungary, summarized)	76.0 (15)	128.9 (9)	68.5 (14)
Bronze age (Mokrin, Tápé, Tiszafüred)	75.0 (59)	128.8 (28)	69.0 (45)
Scythian Period (Szabadszállás)	77.0 (19)	130.6 (5)	68.4 (7)
La Tène, 4-1.c.BC. (Hungary, S-W.Slovakia)	75.5 (22)	126.7 (17)	69.8 (15)
Sarmatians, 1-4.c.AD. (Hungary, summarized)	77.8 (19)	132.6 (18)	70.5 (17)
Roman Period, 4-5.c.AD. (Gorsium)	75.4 (34)	133.8 (32)	69.6 (32)
Avar Period, 6-9.c.AD. (Hungary, summarized)	78.7 (376)	134.3 (271)	69.8 (392)
Hungarians, 10.c.AD. (summarized)	80.5 **	138.4 (57)	72.5 (64)
Arpadian Epoch, 11-13.c. (Hungary, summarized)	76.2 (729)	132.7 (507)	70.5 (627)
Medieval Epoch, 13-16.c. (Hungary, summarized)	79.0 (107)	132.1 (68)	69.0 (103)
Modern times, 16-19.c. (Budapest-Váci ut, Zombor)	81.6 (119)	132.9 (102)	69.9 (110)

** Calculated after mean-values by TÓTH

Note - For the analysis of the epochal changes of characteristics, in addition to his own results, the author also resorted to the numerical data of ALLODIATORISZ, BARTUCZ, DEÁK, DEZSŐ, ÉRY, FARKAS, LIPTÁK, LOTTERHOF, MARCSIK, NEMESKÉRI, STEIN, WENGER (Hungary) and VLČEK (Czechoslovakia).

- Literature references not appearing in the list are given by TÓTH (1965-1974)

Table 6. Some craniometrical data from Central Danubian Basin (females)

Characteristics / MARTIN's numbers / Epochal groups	8:1	45	48
Neolith (Kisköre-Gát)	75.9 (8)	128.5 (2)	64.5 (2)
Aeneolith, Baden-culture (Hungary, summarized)	77.6 (7)	118.4 (5)	64.5 (6)
Bronze age (Mokrin, Tápé, Tiszafüred)	77.4 (69)	122.8 (34)	65.8 (52)
Scythian Period (Szabadszállás)	76.3 (21)	125.5 (2)	68.2 (4)
La Tène, 4-1.c.BC. (Hungary, S-W.Slovakia)	78.2 (13)	123.6 (9)	68.2 (8)
Sarmatians, 1-4.c.AD. (Hungary, summarized)	81.7 (15)	126.1 (13)	65.0 (14)
Roman Period, 4-5.c.AD. (Gorsium)	76.6 (26)	124.1 (25)	65.4 (26)
Avar Period, 6-9.c.AD. (Hungary, summarized)	80.4 (263)	125.3 (205)	65.6 (293)
Hungarians, 10.c.AD. (summarized)	82.4 **	130.2 (46)	67.3 (46)
Arpadian Epoch, 11-13.c. (Hungary, summarized)	76.7 (225)	124.9 (215)	66.4 (254)
Medieval Epoch, 13-16.c. (Hungary, summarized)	81.1 (84)	123.4 (53)	64.5 (67)
Modern times, 16-19.c. (Budapest-Váci út, Zombor)	82.3 (74)	124.9 (59)	65.4 (60)

** Calculated after mean-values by TÓTH

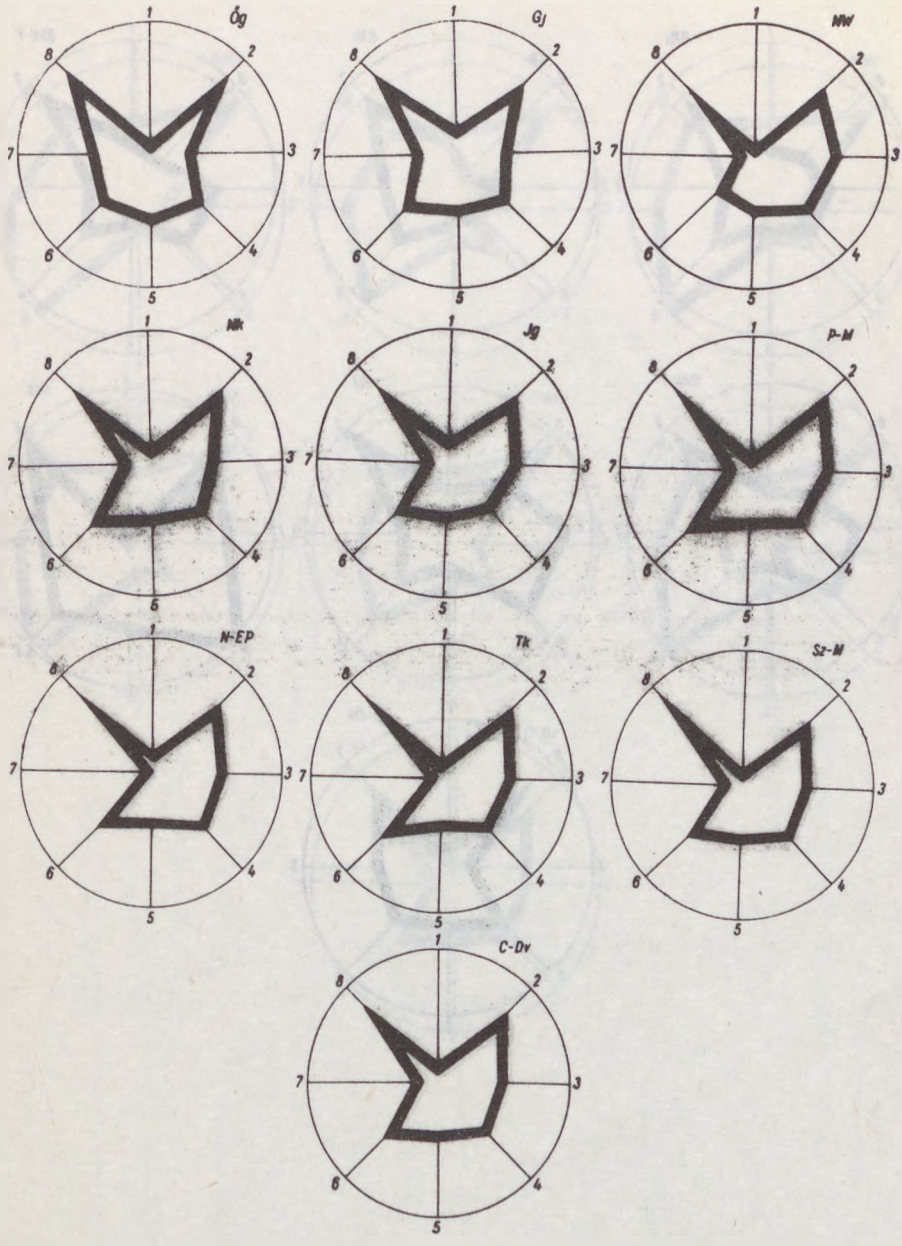


Fig. 1. Comparison of some Hungarian groups. Abbreviations: Ög = Őrség, Gj = Göcsej, NW = North-West (Rábaköz), Nk = Nagykunság, Jg = Jászság, P-M = southern Palóc and Matyó, N-EP = North-East Palóc, Tk = Taktaköz, Sz-M = Szamosmellék, CD.v. = Central Danubian variant

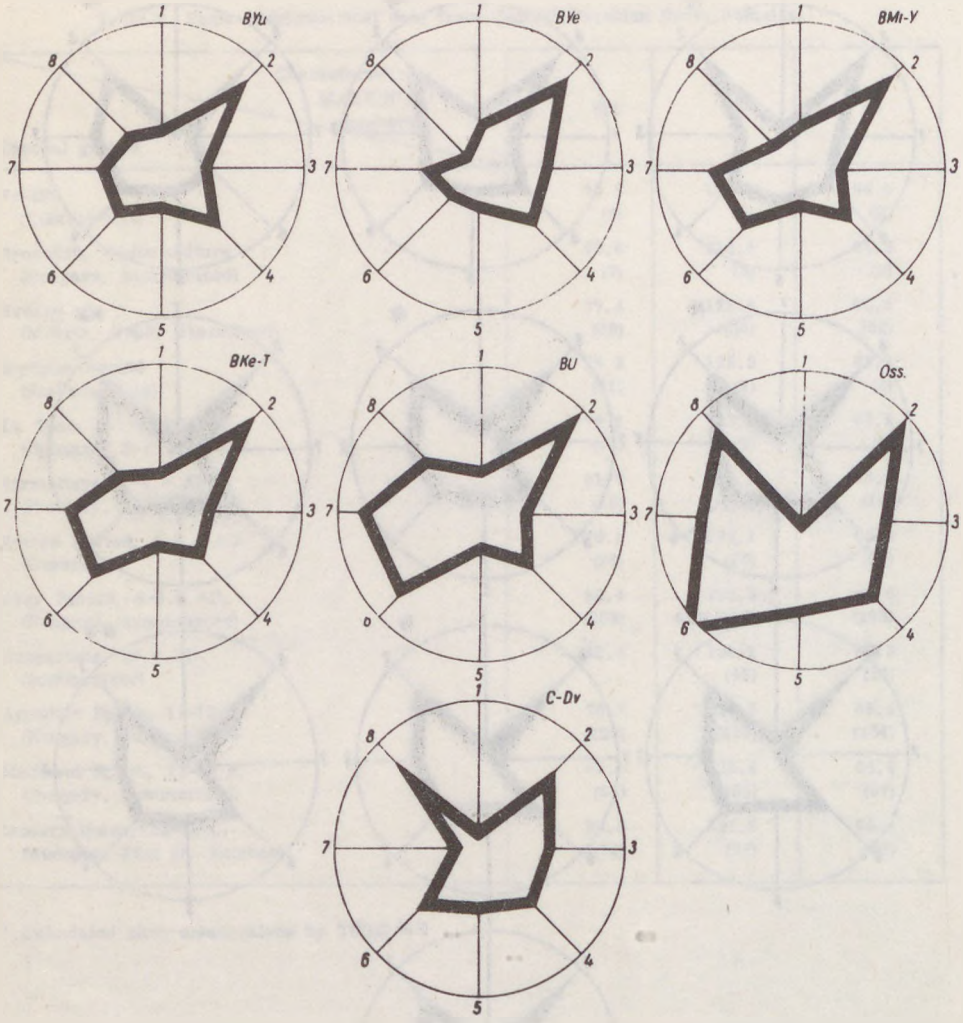


Fig. 2. Comparison of some Hungarian and other groups. Abbreviations: BYu = Bashkir-Yurmata, BYe = Bashkir-Yenei, BMi-Y = Bashkir Min-Yaik, BKe-T = Bashkir Kese-Tabuen, BU = Bashkir-Usergan, Oss = southern Ossetians, CD.v. = Central Danubian variant

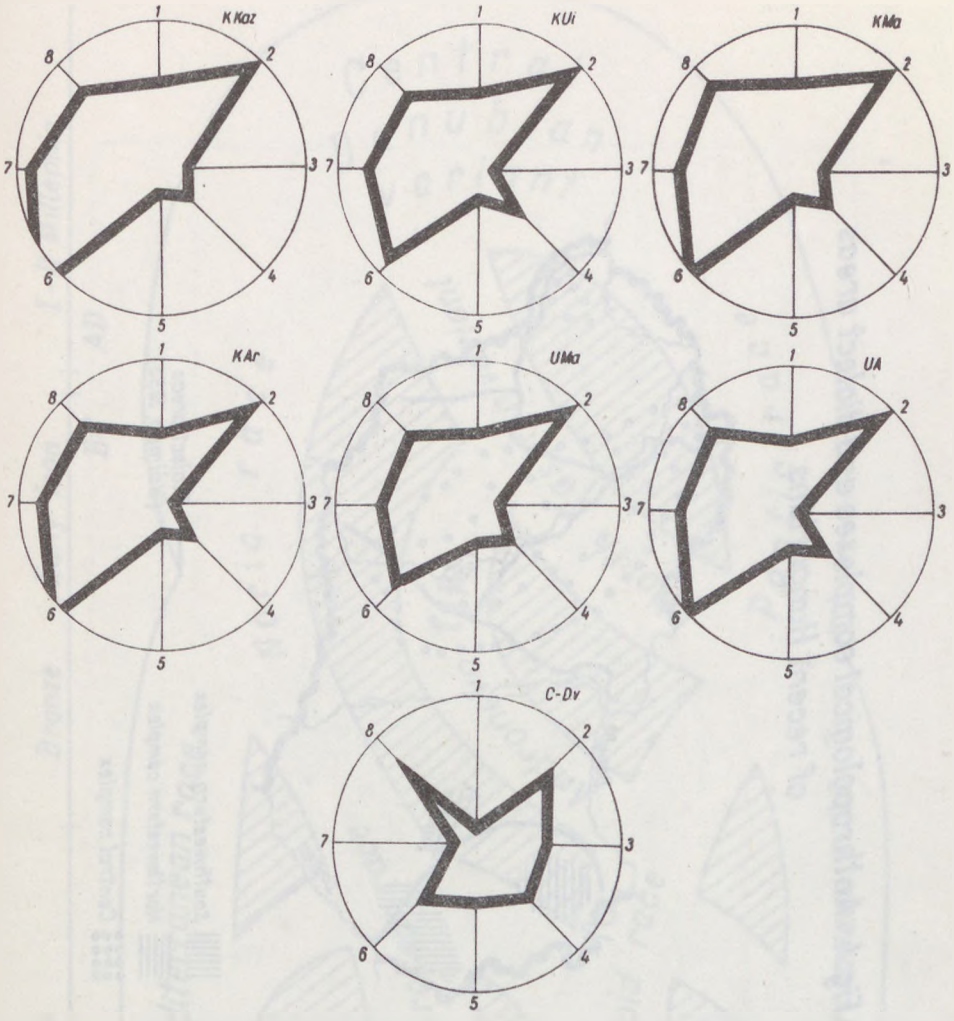
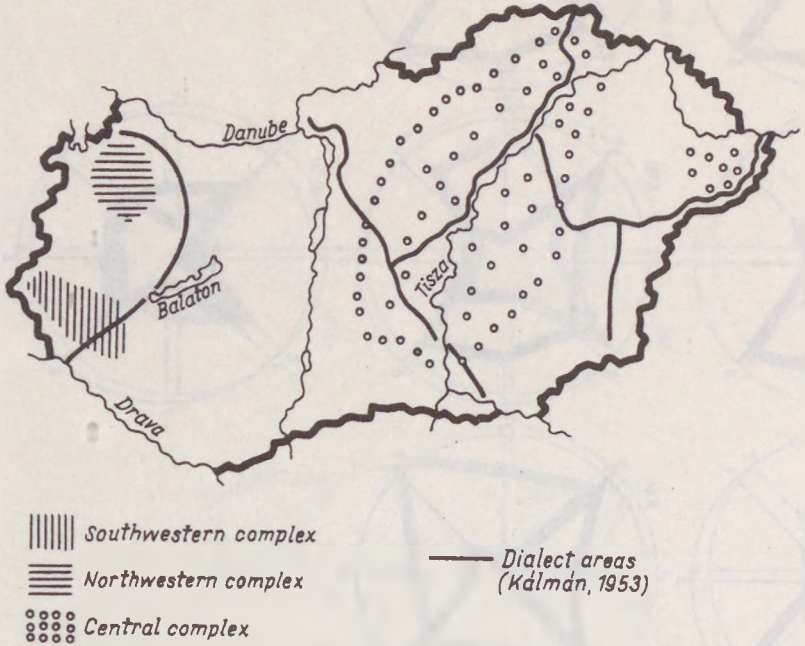


Fig. 3. Comparison of some Hungarian and other groups. Abbreviations: K Kaz = Kiptshak (Kazahstan), KUi = Kazah Uisun, KMa = Kazah Madiar, KAr = Kazah Arguen, UMa = Uzbekh Madzhar, UA = Uzbekh Asis, CD.v. = Central Danubian variant

Fig. 4. Anthropological complexes and dialect areas of recent Hungarians



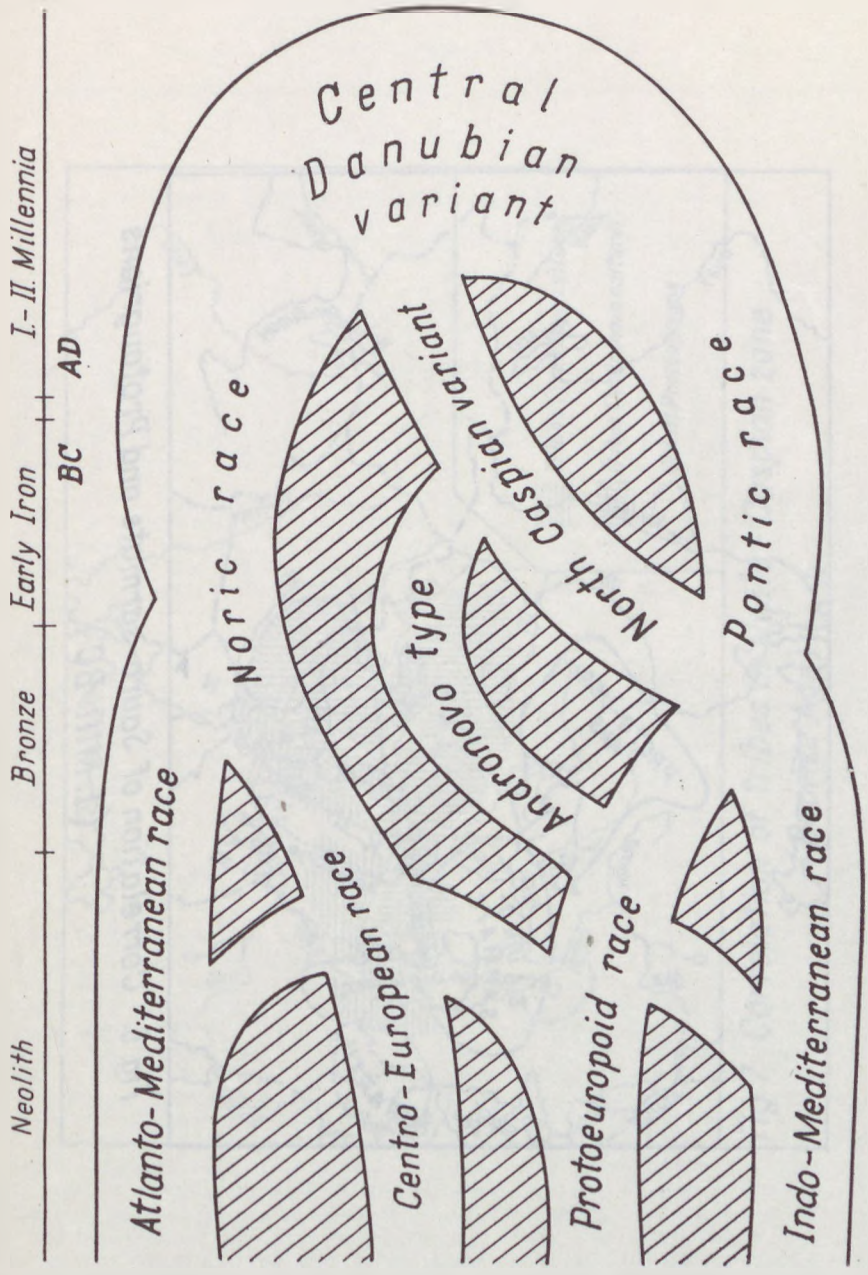


Fig. 5. Morphogenetic processes in the Central Danubian Basin

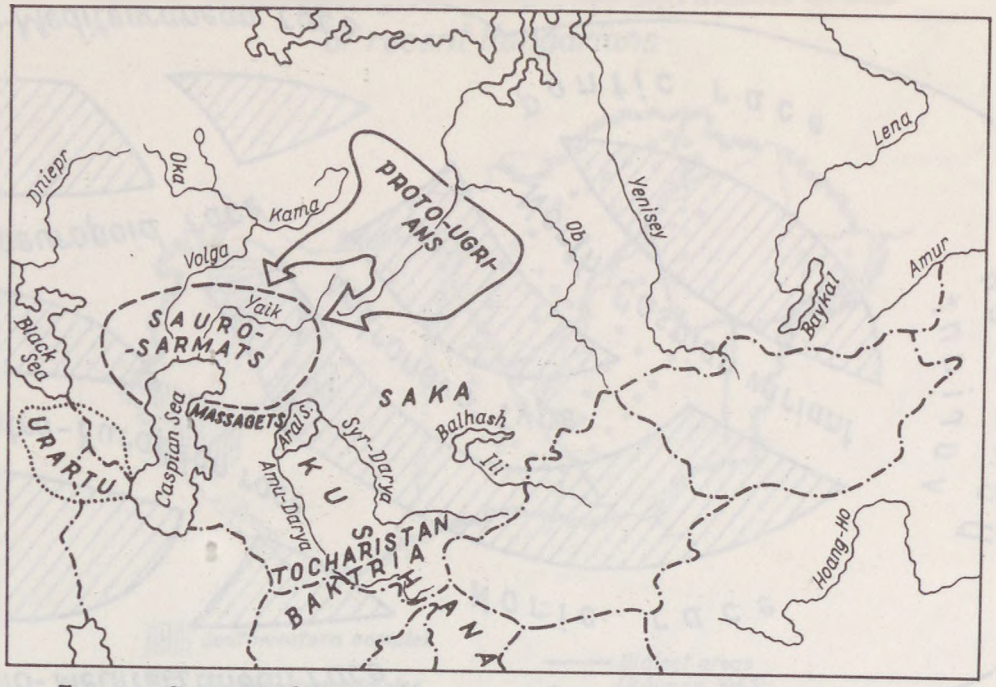


Fig. 6. Correlation of Sauro-sarmats and Protougrians (I. Mill. BC)

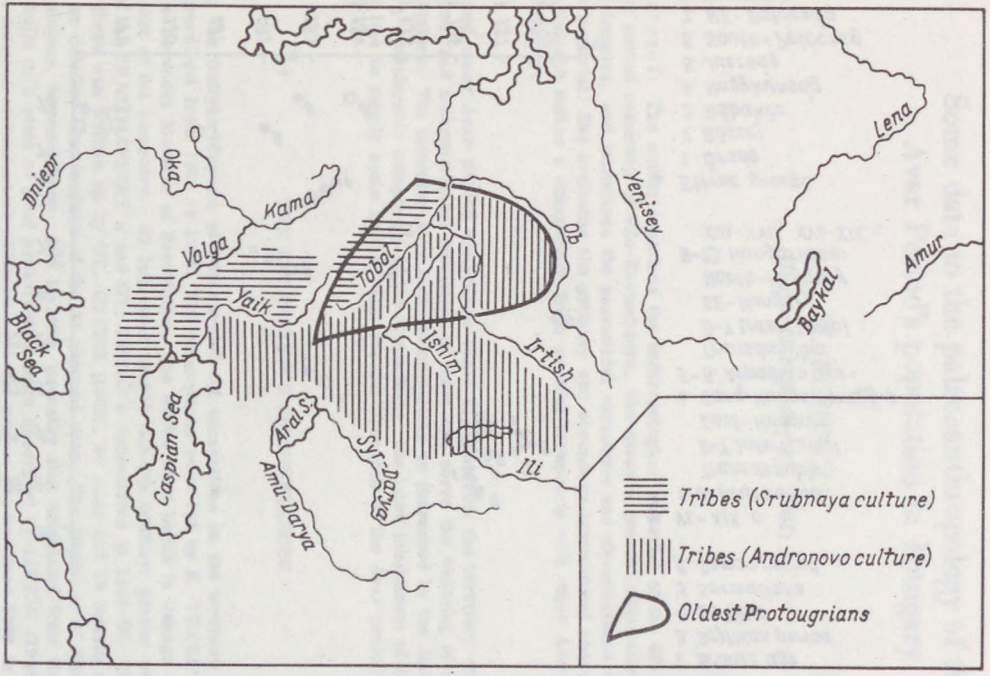
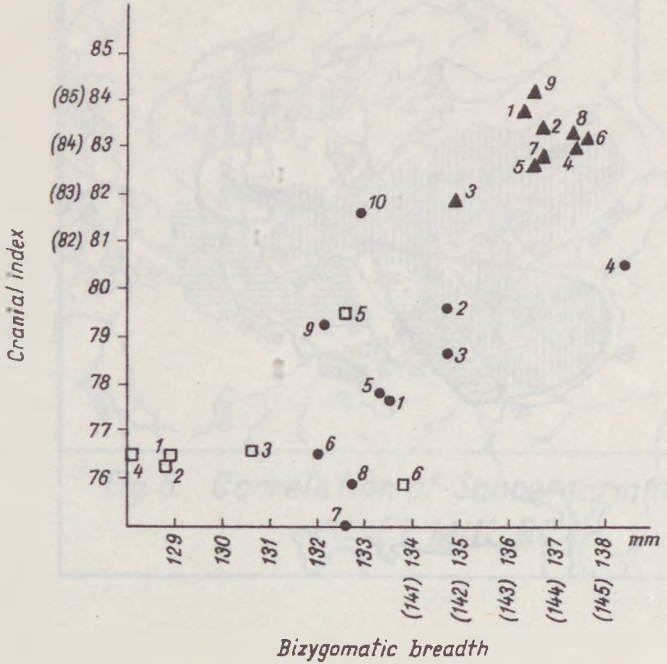


Fig. 7. Correlation of tribes in Uralo - Caspian zone (Bronze Age)

Fig. 8. Topography of craniological series and living male groups from Central Danubian Basin



□ Aeneolith - Iron Age
1. Baden - culture
2. Bronze age
3. Scythian period
4. La Tène
5. Sarmatians
6. Roman period

● VI.- XIX. c.
1-3. Avar period:
Transdanubia
D-T Interfluvial
East-Hungary
4. Conq. Hungarians, X. c.
5-8. Arpadian age:
Transdanubia
D-T Interfluvial
SE-Hungary
North-Hungary
9-10. Hungarians:
XIII.-XVI., XVI.-XIX. c.

▲ Ethnic groups
1. Őrség
2. Göcsej
3. Rábaköz
4. Nagykunság
5. Jászság
6. South-Palócság
7. NE-Palócság
8. Takťaköz
9. Szamosmellék

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Some data to the palaeoanthropology of the Avar Period's population in Hungary

By

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Abstract: The author examines the anthropological material of the 401 graves of the Avar period cemetery of Vác-Kavicsbánya. She gives a general characterization of males and females, and introduces the anatomical variations and abnormalities which occur in this material. She evaluates the primary and secondary taxonomical characteristics. At the end she makes a comparison from several viewpoints with other Avar period series of Hungary.

A good many Avar period cemeteries came to light from the territory of our country. The archeological and anthropological treatment of them can serve the widening of our knowledge of Avar prehistory. The importance of these examinations is increased by the fact that the Avars made up a considerable component of the Hungarians, the later inhabitants of the Carpathian-basin. We would like to supply some further data for the research of the Avar period's anthropological problems.

THE EXCAVATION'S CIRCUMSTANCES

The Vak Bottyán Museum of Vác carried out excavations on the territory of the Concrete Plant's gravel-pit from 1969 to 1976. The excavations were led by S. TETTAMANTI, archeologist of the Ferenczy Museum of Szentendre. The works were begun in linkage with the earlier uncovered part of the cemetery. 82 late Avar period (8th-9th century) graves were found as the results of A. KRALOVÁNSZKY's and GY. DEZSŐ's excavations in 1958-59. The osteological material of these was written up by GY. GYENIS (1968). 20 male and 19 female skeletons were suitable for detailed examinations of the 70 rescued ones. The series is of Europid character. The 3 skeletons, rescued by Á. SÓS in 1952, probably also originated from this cemetery. Of these 2 skulls in a state of good preservation were described by LIPTÁK (1956).

The detailed archeological elaboration of the graves dug up since 1969 is in process (TETTAMANTI). By preliminary information the cemetery can be ascribed to the 7th-8th centuries. The graves are mostly orientated to Northwest-Southeast and in some cases to West-East. The rate of disturbing was found to be almost 50 percent. The cemetery is very rich in grave goods.

The excavations of this cemetery were finished in 1976. The overall number of uncovered graves is 575. A part of the cemetery is inaccessible so an estimated group of about 100 graves cannot be brought to light. As a consequence of these we must be very cautious when evaluating the results of anthropological examination.

The material of 401 graves was transported to the Anthropological Department of the Hungarian Natural History Museum for treatment. Later it will be stored by the Vak Bottyán Museum of Vác.

MATERIAL AND METHOD

From the osteological material of 401 graves - examined by me - skulls and skeletal bones were found in 316 cases. I could examine only skulls from 28 graves and only postcranial material from 57 ones. The total number of skulls found is 344. 119 of these are undetermined sex (infans and juvenis age groups and group of undeterminable age). There are 94 male and 131 female skulls. It follows from the broken condition of the material that only 24 male and 22 female skulls - all in all 46 individuals - were suitable for minute metrical and morphological analysis. Taxonomical analysis was possible to be done on 39 skulls - on 23 male and 16 female ones. I have accomplished the possible morphoscopical examinations on the broken, not measurable skulls.

Though postcranial material came to light from 373 graves we could take the measurements necessary for the calculation of stature on the skeletal bones of only 73 individuals. The stature of 14 out of 24 males with well preserved skulls could be calculated. I can give the stature value of 13 out of 22 females with well preserved skulls. I measured the skeletal bones of 46 individuals (23 males, 23 females) whose skulls - because of their broken and defective state - were unsuitable for morphometrical analysis.

The distribution of the population by sex, age and preservation can be found in Table 1. Table 2 demonstrates the distribution of all skulls in the series by similar viewpoints.

We established the age of adults at the time of death on the basis of the ossification of cranial sutures' endocranial surface and the grades fixed by VALLOIS for the ectocranial surface. We took into consideration the degree of abrasio according to KÖRBER. We examined the ossification of epiphysises and the surface changes of the facies symphyseos of os pubis according to NEMESKÉRY & HARSÁNYI (in FARKAS 1972). In case of children the order of deciduous and permanent teeth's eruption forms the basis of determination. We considered the closing of the synchondrosis sphenooccipitalis in separating of the juvenile group from the adults. We applied the age-group system of MARTIN & SALLER (1957) at the evaluation of results. We determined sexes by the anatomical characteristics showing sexual dimorphism on the skulls and on the skeletal bones.

The skull's absolute measurements were taken by MARTIN's method (1928). We proceeded by the DEBETZ & TÓTH methodology (in FARKAS 1972) with the determination of special facial flatness. In our calculations we determined the averages of individual dimensions and indices (M), the range of variations (V_{min}-V_{max}) and the dispersion (s). We used DEBETZ's categories (ALEXEYEV & DEBETZ 1964) in the classification of anthropometrical characteristics. We performed the taxonomical analysis of primary characteristics on the basis of DEBETZ's (ALEXEYEV & DEBETZ 1964) and TÓTH's (1958, 1962, 1967, 1968, 1969) works. We evaluated secondary characteristics according to LIPTÁK's (1965, 1969) taxonomical method.

We determined stature by two methods, on one hand on the basis of tables containing MANOUVRIER's (1892) data given by MOLLISON (1938), on the other hand by using the BREITINGER (1938) & BACH (1965) method. We calculated cranial capacity by WELCKER's method (in FARKAS 1972).

We accomplished distance-calculations according to PENROSE (1954) in our biometrical examinations. We employed for the comparison of our series with other Avar period ones ALEXEYEVA's (1966) special indices and the praeauricular faciocerebral indices (PFC) of the chosen cemeteries according to DEBETZ (1964). The combined examination of male and female series is possible by the application of sexual dimorphical coefficiences given by DEBETZ (ALEXEYEV & DEBETZ 1964).

We evaluated the special facial flatness data by utilizing the facial flatness index which was determined by the method of DEBETZ & TÓTH (in FARKAS 1972).

PALEODEMOGRAPHICAL ANALYSIS

Summing up the partial results we can state for the whole cemetery that 62 individuals belonged to Infans I age-group, 35 individuals belonged to Infans II age-group. All in all these

make up 24.2% of the population (Tables 1 and 2).

The number of children in comparison with the number of adults is small and irrealistic. This is especially true in comparison with ACSÁDI's (1965) average for the Arpadian period by which the proportion of individuals who died in Infans I age was 33.7%. The relatively small number of individuals of Infans I can be explained probably not by favourable mortality but by burial customs (ÉRY 1967). One of the theories is that not all the children were buried in the community's cemetery. One of it's evidences - though not an unconditional one - is a single child grave found near a house at the excavation of Transdanubian Avar settlement (MAKKAY 1966). It is possible that girls had not the same economic and social value as boys and so they were not buried in the common cemetery always. The determination of sex by histo-chemical method can help us to solve this problem (ÉRY 1967).

The number of males is 107 and that of females is 145. We can tell on the basis of distribution by age that 39.3% of the males died in adult and 59.8% in mature age. 62.1% of the females died in adult age and only 33.8% lived to mature age. This rate could develop as a result of maternity (ACSÁDI 1965).

GENERAL ANTHROPOLOGICAL ANALYSIS

Brain-cases of males according to the mean-values are medium long, medium wide and medium high. They are dolichocranic, orthocranic, acrocranic, metriometopic according to the calculated indices. The characteristics of facial skeletons are as follows: medium wide zygomatic arc with narrow bizygomatic breadth. Faces are of medium height, upper faces are low. Orbitum are medium wide and low. Nasal apertures are medium wide, low. Facial skeletons according to the indices are mesoprosopic and euryen. Orbitum are chamaeconch. Noses are mesorrhine. Palates are mesostaphyline (Tables 3 and 4).

Brain-cases of females according to the mean-values are medium long, medium wide and medium high. They are mesocranic, orthocranic, metriocranic and metriometopic by the calculated indices. The characteristics of facial skeletons on the basis of the mean-values: medium wide zygomatic arc with medium bizygomatic breadth. Faces are medium height, upper faces are low. Orbitum are medium wide and low. Nasal cavities are medium wide, medium high. Facial skeletons are mesoprosopic and euryen according to the indices. Orbitum are chamaeconch. Noses are mesorrhine. Palates are brachystaphyline (Tables 3 and 5).

It is verifiable on the basis of the results of the morphological marks' examination that the male skulls' circumferences in norma verticalis are - in almost equal numbers - birsoid and sphenoid. Glabella is generally markedly developed. The most frequent is degree 3. Arcus superciliaris is strong. Protuberantia occipitalis externa is medially developed. Processus mastoideus is strongly or medially developed. Apertura piriformis is anthropin in 44.7% of the cases. Fossa praenasalis can be seen at 36.8%. Spina nasalis anterior is medially developed, usually of degrees 3 and 4. Fossa canina is flat or medium deep. Alveolar prognathy is mostly moderate. Abrasion of teeth is considerable in 32.1%.

Females' skulls circumference in norma verticalis is pentagonoid in the majority of cases. Glabella is weakly developed, most frequently of degrees 1 and 2. Arcus superciliaris is mostly flat, protuberantia occipitalis externa is weakly developed, the proportion of degrees 0 and 1 is almost the same. Processus mastoideus is usually small. Apertura piriformis is anthropin in 55.6%, fossa praenasalis can be seen in 33.3%. Spina nasalis anterior is medially developed, most frequently of degree 3. Two contrasting groups occured when we studied fossa canina: flat in 32.4% and deep in 29.7%. Alveolar prognathy is moderate and expressed in the same proportions. Teeth are less worn than that of males: there is no abrasion in 60% or only the abrasion of masticatory surfaces has begun. This difference can be the result of the lower mortality age of females (Table 6).

Stature of males on the average is great medium calculated by BREITINGER's method (high is the most frequent by distribution). Calculated by MANOUVRIER we got a medium stature value (small medium is the most frequent category by distribution). Stature of females on the average is high on the basis of BACH's method (the rate of great medium is the highest by distribution). A small medium value occured by MANOUVRIER's method (small medium being the most frequent by distribution too). The two methods produce strikingly different, contradictionary results. It would be a mistake to consider any of them absolutely valid. However the comparison of series

and individuals within those series which were elaborated by authors utilizing these methods and categories doesn't lead us to false results (Tables 4 and 5).

ANATOMICAL VARIATIONS AND ABNORMALITIES

We recorded the presence of 13 characteristics. We studied the fragmentical unmeasurable material as well. We calculated the percentage of total number of cases of each individual characteristic on the basis of the cemetery's total number of graves (401), though quite frequently the bone conditionally carrying a given characteristic is absent and so the lack or existence of the anomaly cannot be verified. The outcomes of our studies are summarized in Table 7. The given percent values are valid for the individual characteristics' number of occurence.

Sutura metopica is perceptible on 19 skulls (6 males, 12 females, 1 Juvenis), this is 4.7% of the population. This rate is closely resembling that of WENGER's (1974) 5.7% average calculated for series of the Avar period in Hungary.

Os apicis occurs all in all on 16 skulls (4 males, 10 females, 2 Juvenis), this is 4.0% of the population. This is higher then the average of Avar period series in Hungary (WENGER 1974). In our case the frequency of occurence is greater at the females as contrasted with WENGER's experiences.

When examining ossa wormiana we grouped the bones occuring within these by sutures. We can find it most often in the lambdoid suture, at 12.7% of the population. This is followed by the occurence of it in the arrow suture (1.7%), at the incisura parietalis (1.0%) and at last in the crown suture (0.7%). We may state that it is more frequent at males than at females in our cemetery. The rate of ossa wormiana - occuring in all sutures - is 16.2%, somewhat higher than the average of the Avar age in Hungary, which is 14.3% (WENGER 1974).

Os epiptericum could be found on 3 skulls (1 male, 2 Juvenis), that is 0.7% of the population. Our value significantly differs from the one published by WENGER (1974), which is 2.9%.

Bathrocephaly occured in 8 cases, in 2.0%. It is perceptible generally in a moderate form.

Weakly developed torus palatinus sagittalis could be found on 2 male skulls. This is 0.5% of the population.

Os bregmaticum was noticeable on 1 male skull. This is 0.2% of the population, less than the average 0.5% given for Avar period series in Hungary (WENGER 1974).

Both third molars are peg-shaped on 1 female skull (grave 188). This is 0.2% of the population. The right upper medial incisivus of the juvenile aged skull of grave No. 145 is shovel shaped. It is a pity that the skull is fragmentic and incomplete and because of these unsuitable for detailed morpho-taxonomical examination. However, the nasal region's profiling makes Europid character presumable. A great difference revealed itself in the occurence of this type of dental variation between Europids and Mongolids. DEZSŐ (1968) has pointed out the racial diagnostical importance of shovel shaped teeth in Hungarian literature. The moderate form of shovel shaped tooth can be observed in very high percentage in the Finnish population to the contrary of the fact that serological and other examinations indicated only a very minimal presence of Mongoloid elements. Futher research activities are necessary for the total disclosure of this problem (KOSKI & HAUTALA 1952). However, it should be noticed, that the evaluation of odonthological characteristics was consideraly refined during the last 20 years.

Perforatio fossae olecrani humeri appeared at 27 individuals, that is 6.7% (3 males, 23 females, 1 Juvenis).

Processus supracondyloideus can be found on the humerus of 2 individuals, 1 male and 1 female.

Sacrum bifidum occured on the rump-bones of 33 individuals (8.2%). Division: 20 males, 11 females, 2 Juvenis.

Sacralisatio was the reason of the synostosis of the last lumbal vertebra and the sacrum of 4 males. This is 1.0% of the population.

On the basis of the occurence of the examined anathomical variations it can be stated that anomalies are more frequent on female skulls and skeletal bones (91 cases, 50.3%) than on male ones (77 cases, 42.5%) in the Avar period cemetery of Vác-Kavicsbánya.

TAXONOMICAL ANALYSIS

The comparative evaluation of the group of characteristics is necessary to establish racial diagnosis. For the sake of a more accurate process we analysed individual characteristics one by one too, keeping in view their differences from the taxonomical point of view.

1. The evaluation of primary taxonomical characteristics

Aiming at completeness of anthropological examination one cannot omit the analysis of primary taxonomical characteristics (TÓTH 1958). The purpose of this is to separate Europoid and Mongoloid components. Our examinations covered 18 male and 16 female skulls (Tables 8 and 9).

Nasomalar angle (Martin 77) values were similar to those of Mongoloids on 1 male (grave 215: 145.6) and 2 female skulls (grave 170: 144.3; grave 353: 150.6). The averages of both the male and the female series seem to be similar to that of Europoids.

Zygomaxillar angle (ZM) values give basis to the statement, that skulls examined are of Europoid character by both the individual data and the averages.

Dacryal subtense (DS) value of 1 male skull (grave 212) is close to the mean value of the group averages of Europoids and Mongoloids (10.9). Females show a greater rate of similarity to Mongoloids. DS values approach the average of Mongoloids in 4 cases (graves 162, 230, 289, 352) and in 2 cases (graves 157, 350) they approach the mean value of group averages. As far as averages are concerned males as well as females are similar to Europoids.

Simotical subtense (SS) values of 3 males (graves 203, 215, 262) and 2 females (graves 170, 350) were found to be close to that of Mongoloids. The skull of Grave No. 212 is intermediate between Europoids and Mongoloids (3.6). Averages are of Europoid character.

Dacryal index (DS:DC) values of the male skull of Grave No. 202 and the female skull of Grave No. 214 are similar to the mean value group averages of Europoids and Mongoloids. The averages are close to that of Europoids.

Simotical index (SS:SC) value of the male skull of Grave No. 202 is surprisingly low, 22.1, showing a very marked Mongoloid effect. 4 female skulls are also closer to Mongoloids (graves 148, 170, 214, 290). The examined fragment of the population is similar to Europoids.

Nasalspine angle (Martin 75_1) values show Mongoloid effects on 5 male skulls (graves 117, 169, 203, 212, 326). The measured values of 25.0° of the male skull of Grave No. 316 and on the female skull of Grave No. 129 approach the mean value of the group averages of Europoids and Mongoloids. 4 female skulls (graves 120, 157, 170, 214) are similar to Mongoloids. The mean values point towards an Europoid character.

Index of incisure maxillo-malar (IMMS:IMMC) provides important complementary information to data of facial flatness examinations (TÓTH 1962). Deeper and shorter maxillo-malares are characteristic for Europoids and flatter and longer ones are characteristic for Mongoloids. In our cemetery both the male and female series are of Europoid character, but the IMMS:IMMC values of 3 males (graves 215, 316, 491) and 1 female tend towards of Mongoloids.

Index of malar arc (S:C) examinations of 2 male skulls (graves 169, 316) and 2 female skulls (graves 148, 353) found Mongoloid characteristics. The male and female series are both of Europoid character on the basis of averages. The examination of the S:C is not suitable in itself for the separation of primary taxonomical components. However, together with the other data of facial flatness it can usefully refine the examination's outcomes (TÓTH 1964, 1968).

Bizygomatic breadth (Martin 45) values of males as well as females indicate that medium wide face is characteristic for both sexes. Although great bizygomatic breadth is an evidence of Mongoloid character by some earlier publications, it does not prove Mongoloid influence in itself according to the examinations of TÓTH (1967).

Fossa canina's depth's position within the system of taxonomical analysis was written up by TÓTH (1967) in his methodical work. He established that as fossa canina has a considerably great intra- and interracial variability it cannot be interpreted as a primary taxonomical character. However, it might provide valuable supplementary data within the character-complex. In our case the values of males as well as females have a great extent of variations. The shallowest fossa caninae were found on the male skulls of Grave No. 198, 204 (1.8) and on the female skull of Grave No. 157 (1.5). It is medium deep at both sexes on the basis of mean values.

Facial flatness index examinations also confirm the Europoid character of our cemetery. Its value turned out to be 6.2

Summing up the experiences we may state that Europoid characteristics dominate the osteological material of the Avar period cemetery of Vác-Kavicsbánya. The examination of primary taxonomical characteristics on some skulls produced values approaching those of Mongoloids, but only in the case of two or three characteristics per individuals. Moderate scale Mongoloid influence can be noticed on the male skull of Grave No. 215 and on the female skulls of Grave No. 157 and 170.

2. Analysis of secondary taxonomical characteristics

We used the so called distribution on the basis of the ruling component method (LIPTÁK 1954a) in the process of our type analysis. The results of individual diagnosis made it possible for us to shape up the general anthropological character of the cemetery examined. The advantage of this method is that individual finds can be summarized by viewpoints chosen at will (LIPTÁK VÁMOS 1969).

We could carry out morphotaxonomical examinations on 39 skulls of good preservation. 23 of these were male skulls and 16 female ones. We took into consideration stature values obtained by the BREITINGER (1938) BACH (1965) method (Table 10). The characterization of individual taxons can be found in LIPTÁK's university handbook (1969).

This series shows the characteristics of the Nordoid group with the greatest frequency within the Europid great race. 5 males and 7 females belong to this group. Nordic characteristics are mixed with those of an undetermined type on the male skulls of Graves No. 117 and 169 and on the female skulls of 5 graves (No. 157, 244, 289, 345, 350) (n-x). The characteristics of type crA can be observed on 1 male (grave 431) and 1 female (grave 238) skull (N-crA). The female skull of Grave No. 214 can be classified into the n-cr(x) group because it bears Cromagnoid as well as Nordoid race characteristics.

6 males and 4 females can be classified as Brachycrans. The characteristics of the Pamirian race can be found on 2 male skulls (graves 297, 491). The female skull of Grave No. 233 is a representative of the Armenoid race (a). The male skulls of Graves No. 123 and 313 and the female skull of Grave No. 290 belong to the undetermined Brachycrans. We used the designation br-x in 4 cases, in which the combination of several characteristics can be observed, but none of them is dominant.

The Cromagnoid group is represented by 7 skulls, of which 5 are males and 2 are females. The characteristics of the type crA are dominant on the male skull of Grave No. 316. In the cases of 2 males (graves 128, 198) and 1 female (grave 170) the characteristics of this type are mixed other, undetermined characteristics (crA-x). The crB group is represented by the male skull of Grave No.215 and the female skull of Grave No. 129. The crB characteristics are mixed with other ones on the male skull of Grave No. 267 (crB-x).

The Gracile Mediterranean type (m) is present in the greatest number from the Mediterranean group: the male skulls of Graves No. 204, 232, 234. The characteristics of an other undetermined type also appear on the male skull of Grave No. 156 and on the female skull of Grave No. 162 (m-x). We can see clearly the characters of the Atlanto-Mediterranean type (am) on the male skull of Grave No. 284 and we can see them mixed with the characteristics of another type on the female skull of Grave No. 210 (am-x).

3 individuals (7.7%) with extremely low skulls could be found in our series (Hyperchamaecrans on the basis of the value of the length-height index) and we gave them the Chamaecran Europids collective designation. The male of Grave No. 334 and the female of Grave No. 120 are both of large-medium stature and are Mesocranians. The male skull of Grave No. 202 is a bit fragmentic, so the value of the cranial index is absent, but the characteristic skull form of Chamaecranians is clearly visible. All the three skulls are of Europid character, though two primary taxonomical characteristics of the male skull of Grave No. 202 and one of the female skull of Grave No. 120 indicate Mongoloid influence. As Chamaecrania is characteristic for the majority of Mongolid race their frequent occurence on Mongolid types is understandable. Some ancient Europid races could have its part in the formation of the similarly high rate which is perceptible on Europoid types (LIPTÁK 1954a). These can be found in several series of the Avar period, for example their rate is 14.5% in the series of Szeged-Kundomb (LIPTÁK & MARCSIK 1966) and 19.1% in the series

of Sükösd (KŐHEGYI & MARCSIK 1971). The occurence of Chamaecrans in Avar period series calls for further examinations - because of its Race- and Ethnogenetical significance.

The low number of skulls suitable for analysis warns us to be cautious when summarizing the results of taxonomical examinations (9.7% of the population, 15.5% of the adult males and females). It can be stated, that the Avar period cemetery of Vác-Kavicsbánya is of Europid character. The order of main race components is: Nordoids (30.8%), Brachycranians (25.6%), Cromagnoids and Mediterraneans (both 17.9%), Chamaecran Europoids (7.7%). The osteological material of our cemetery is heterogeneous on the basis of these. The male and female series show some dissimilarities, but the differences are insignificant. The order of the types' frequency is the same as that of the whole cemetery in the case of females, while the number of Brachycrans is the greatest in the case of males, but the other types very closely follow it. The share of Chamaecrans is the least at both sexes.

COMPARATIVE ANALYSIS

We compared the osteological material of our cemetery with 21 other Avar period series. Several viewpoints dictated the choice of these cemeteries. We took in consideration the case numbers of series beside the distribution in space and time. We chose 9 Transdanubian cemeteries, 9 ones from between the Danube and the Tisza and 3 ones from beyond the Tisza on the basis of these. These were used between the 6th and the 9th Centuries. We carried out the comparison by utilizing several methods.

THE RESULTS OF TAXONOMICAL EXAMINATIONS

The majority of Europids is characteristic for the anthropological series found and written up the Avar period. In the order of their rate of share Brachycrans, Nordoids, Cromagnoids and Mediterraneans make up the more important race components. The population of the 10th-12th centuries can be characterized with the order: Nordoids, Mediterraneans, Cromagnoids and Brachycrans (LIPTÁK & VÁMOS 1969).

On the basis of this the Avar period cemetery of Vác-Kavicsbánya is a transition between the Avar period's Europid population and the populations of the Arpadian age. The males reflect more of the Avar period's average population than the females or the cemetery as a whole do. The comparison was made more difficult by the fact, that a number of authors used methods differing from LIPTÁK's taxonomical method that I applied, and they didn't always specify their system.

Considering the full image of our series the cemetery shows no identity with any of the comparative series. The material of the 6th-7th century Előszállás-Bajcsihegy, which is characterized by the lack of Mongoloid elements and by the great frequency of the Nordic type, can be declared similar. However, the ratio of Mediterraneans and Brachycrans is different. The Fehértó-A and Homokmégy-Halom late Avar period cemeteries are analogous to our one on the basis of the frequency sequence of the more important taxons appearing. But there is an important difference too, namely that Mongoloid elements also occure in these series, if only in small percentage. The same types constitute the material of the cemeteries of Alattyán, Tiszavasvár and Szeged-Kundomb as that of Vác-Kavicsbánya. However, the incidence sequence of the taxons occuring is different. The Brachycran elements are dominant, these are followed by the Cromagnoid and Nordic types and in the least quantity by the Mediterranean group. Considering their anthropological aspects these cemeteries reflect the most the average population of the Avar period. Our male series are closer to them than our cemetery as a whole. The males of Vác-Kavicsbánya show similarities especially to the series of Szeged-Kundomb, which is characterized by the greatest percentage of Brachycrans, by the almost equal percentages of Cromagnoids and Nordoids and by the appearence of Chamaecrans. Our cemetery produces the greatest dissimilarities in comparison with the Avar period series of Madaras-Téglavető, in which the percentage of Mongoloids is 58% and the sequence of Europid components is: Cromagnoids, Brachycrans, Mediterraneans. The Üllő I cemetery is also different, which is characterized by frequency sequence of Chinid-Mediterranean-Cromagnoid.

An interesting comparison could be executed with the 7th-8th century cemetery of Váchartyán

(BÁTAI 1952), which is the closest in time and space too. But the author, refering to the small quantity of the material, gives no detailed typological classification. Anyway, the occurence of Mongolids (Chinid) points out the difference of these two series.

THE RESULTS OF EXAMINATIONS BY PENROSE'S METHOD

By the method of PENROSE (1954) the joint evaluation of 12 measurements (MARTIN 1, 5, 8, 9, 17, 40, 45, 48, 51, 52, 54, 55) is possible. The "generalized PENROSE-distance" (D^2_p) gives the individual distance of each of the 21 Avar period cemeteries taken into comparison from the Avar period population of Vác-Kavicsbánya. We have tried to select comparative series with 10 or more cases. We made the calculations in each case, where the authors did not (Tables 11 and 12).

As ÉRY (1970) pointed to the fact, that this method doesn't give enough information for the classification of finer taxonomical differences. For this purpose the more detailed examination of the facial region is necessary.

The male series of Keszthely (2.23), Szebény (3.46), Fészerlak-Puszta (3.56), Környe (4.08) and Csákberény (4.09) come closest to the males of our cemetery. The cemeteries of Előszállás-Bajcsihegy (9.22), Üllő I (9.29), Kecel (9.63), Üllő II (9.94) and Tiszavasvári (12.54) are far from them. There is the least similarity to the male series of Madaras-Téglavető (17.85). The distance of the cemetery of Váchartyán is 6.84 and this can be stated relatively close.

Greater distances and partly different sequence were found at the female series. The female series of Pókaszepetk (3.30), Csákberény (4.02), Ártánd (4.23), Kékesd (4.28) and Keszthely (4.47) come closest to our female series. There is a similarity of smaller degree to the female series of Tiszavasvári (9.32), Üllő I (10.42), Környe (10.70), Szentes-Kaján (11.57). The farthest is the cemetery Madaras-Téglavető (12.26) in the case of females too, but the female series are closer to each-other than the male series. The distance of the females of Váchartyán is 6.94, so the series of both sexes of this cemetery are in an almost equal distance from our ones.

THE TOPOGRAPHICAL REPRESENTATION OF ABSOLUTE MEASUREMENTS

We represented the mutual relations of absolute measurements (MARTIN 8, 45, 48) and three indices (8:1, 52:51, 54:55) and we examined the similarity of the 21 comparative series to our cemetery (Fig. 1-10). We took the averages have been calculated for male and female series.

On the basis of this the males of Váchartyán, Környe, Keszthely are closest to the male series of our cemetery. The male series of Előszállás-Bajcsihegy is similar as far as the correlation of the cranial index-zygomatic arch width and that of the upper-face height-zygomatic arch width are concerned. However, this series is the least similar concerning the relation of the upper-face height-orbital cavity index and that of the nasal index-orbital cavity index. The male series of Madaras-Téglavető, Tiszavasvári, Ártánd are the least similar.

The females of Vác-Kavicsbánya present the greatest similarity the females of Szebény and Csákberény. It is interesting that similar experience can be obtained with the female series of Előszállás-Bajcsihegy to that of the situation with males. While similarity can be seen in skull's habitus as a whole, we can find differences in face's arrangement (eyes, noses). The females of Váchartyán are less similar, than the males. The female series of Szentes-Kaján, Tiszavasvári and Ártánd differ the most.

RESULTS OBTAINED ON THE BASIS OF ALEXEYEVA'S SPECIAL INDICES

We drew into the orbit of analysis the male and female series of 21 Avar period cemeteries (Tables 13 and 14).

The males show the highest degree of similarity to the males of Fészeklak-Puszta, Környe and Kékesd on the basis of the relations of cranial height-breadth-length and the upper face-skull height. The Avar period male groups of Keszthely, Pókaszepetk, Szekszárd-Palánk and Szentes-

Kaján are less similar. It differs the most from the male series of Madaras-Téglavető (Figure 11).

The females of Fészerlak-Puszta, Ártánd, Kékesd produce the greatest similarity to the females of Vác-Kavicsbánya. The female series of Pókaszepetk, Környe, Keszthely are different from our female series. The female series of Madaras-Téglavető differs the most from our ones (Figure 13). The cemetery of Váchartyán shows little similarity at both sexes.

The male series of Üllő II, Szekszárd-Palánk, Keszthely and Fészerlak-Puszta are very closely related to our male series on the basis of the relations of cranial height-orbital height and nasal breadth-facial breadth. The male groups of Váchartyán, Madaras-Téglavető, Ártánd and especially markedly of Előszállás are different (Figure 12).

In the case of female series, the finds of Pókaszepetk are very similar to those of Vác-Kavicsbánya. The series of Fészerlak-Puszta, Keszthely, Üllő II cemeteries are still relatively close to our one. The series of Környe, Váchartyán, Madaras-Téglavető and Előszállás are fairly far from our one (Figure 14).

As a summary we can state that the male and female series of the Vác-Kavicsbánya indicate similarities and differences mostly with the same cemeteries, as far as ALEXEYEVA's special indices are concerned. Considering all the four indices we can find proximity to the populations of Fészerlak-Puszta and Kékesd and difference to those of Madaras-Téglavető and Előszállás-Bajcsihegy.

COMPARISON OF FACIAL FLATNESS MEASUREMENTS

We managed to take under the comparative examination based on the evaluation of primary taxonomical characteristics the data of 13 cemeteries (TÓTH 1970) beside the material of Vác-Kavicsbánya and the average values calculated for the Europoids, the Mongoloids, the Avars of the 7th-8th centuries (TÓTH 1958) and for the conquering Hungarians (TÓTH 1965) (Tables 15 and 16, Figures 15-26). The facial flatness examination of Avar period series occuring in comparison by other methods has not been carried out yet.

On the basis of primary characteristics the males of Vác-Kavicsbánya indicate similarity to the male groups of Környe, Üllő I and Csákberény. The male series of Szebény is less similar, but the cemeteries of Váchartyán, Alattyán and Előszállás are the most different.

The female series shows the closest resemblance to the female groups of Homokmégy-Halom, Előszállás-Bajcsihegy, Kecel I and Alattyán, while Ártánd and Üllő I are far from it. The females of Váchartyán are also different.

It is perceptible at both sexes that there is no similarity to the conquering Hungarians and to the Mongoloids. An interesting comparison presents itself between our cemetery and the Avar and Europoid average population. Vác-Kavicsbánya is generally closer to them, than to the conquering Hungarians and the female series occurs as a transition between the average Avar and Europoid population, in more than one connections.

The evaluation of primary characters does not verify the supposition based on the frequency sequence of occuring taxons, in the sense of which our cemetery would be a transition between the Europid type Avar period population and the population of the Árpád-period. One of the reasons of this can be, that while we compared averages in the case of primary characteristics, the taxonomical analysis is based on the results of individual diagnosis.

THE RELATION OF PFC AND FACIAL FLATNESS INDEX

Considering value of the praeauricular facio-cerebral index (PFC), which turned out to be 88.2 in the case of our cemetery, the series of Vác-Kavicsbánya resemble the Europoids, more closely the bulkier and wider face type, which is characteristic for Northern territories. TÓTH (1974) isolates a more gracile, narrower faced Southern group beside the bulkier Northerners within the Europoid and Mongoloid groups, on the basis of PFC values. Our series resembles the cemeteries of Kékesd and Környe from the comparative series (Table 17).

The relationship of PFC and facial flatness index is represented by Figure 27. Beside PFC and facial flatness index data of Europoids (Middle Ages) those of Europo-Mongoloids (Sarmatian

period), of Mongoloids (Early Iron Age) (DEBETZ 1961) and of the Conquering Hungarians (DEBETZ 1964, TÓTH 1965, 1969) also were taken under examination.

It can be stated, that our cemetery is relatively isolated and different to the series studied. Proximity can be found only to the material of Kékesd and Környe. The values of the Northern and Southern Europoid average populations are also not very much different. The cemeteries of Váchartyán and Üllő I, the Conquering Hungarians and naturally the Europo-Mongoloids and Mongoloids are alien to our series.

We could not contain the material of Vác elaborated by GYENIS (1968) in the comparison carried out by the above viewpoints. The small number of cases makes the use of the comparative methods selected by us impossible. However, we carried out the comparison on the basis of measurement- and index-averages published by that author. As a result it can be stated, that males have shorter, higher and wider skulls in the earlier uncovered part of the cemetery. The females show more resemblance with the females of the later part of the cemetery by the indices of the brain-case, but they are also of a wider head type. It can be stated for the series of both sexes, that the population of the part of the cemetery written up by GYENIS is narrower faced and has higher orbits than the population buried in the part of the cemetery examined by me. The comparison of the stature is not informative because of the utilization of different methodics. Both parts of the cemetery are of Europid character. It was impossible for us to carry out a more refined taxonomical comparison.

When comparing the results obtained from the comparative examination of several viewpoints the male group of the Avar population of Vác-Kavicsbánya presents the most marked similarity with the male groups of Környe, Keszthely and Fészerlak-Puszta. The males of Váchartyán are also similar on the basis of the secondary characteristics' topographical analysis. However this is not supported by the taxonomical analysis and evaluation by other methods. We can find the greatest difference at the male series of Madaras-Téglavető and Előszállás-Bajcsihegy.

The females of Vác-Kavicsbánya show the greatest similarity to the female groups of Pókaszepetk, Csákberény and Homokmégy-Halom. The female series of Madaras-Téglavető and Tiszavasvári are the most different.

All the cemeteries indicating similarities - except Homokmégy-Halom - can be found in Transdanubia. Considering the division by time we can see that both early Avar (for example Környe) and late Avar (for example Homokmégy-Halom) period populations are represented among the similar series.

When judging our results we must be made cautious by the fact that the quantity of comparable material is little because of the fragmentary character of Vác-Kavicsbánya's Avar period series. We cannot admit some genetical connections with any certainty even in the cases of the similar series, because the population of the Carpatian-basin in the 7th and 8th centuries was characterized by large scale heterogenity.

The bone remains of an Avar period population with Europid character, which settled down have been brought to light by the excavation of our cemetery.

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Table 1. Distribution of sex, age and preservation

Types of material	Age groups	Male	Female	Undet. sex	Total	
					N	%
Cranium and post-cranium	Infans I	-	-	47	47	11.7
	Infans II	-	-	27	27	6.7
	Juvenis	1	4	18	23	5.7
	Adultus	33	74	-	107	26.7
	Maturus	58	43	1	102	25.4
	Senium	-	1	-	1	0.3
	Undeterminable	-	-	9	9	2.2
	Total:	92	122	102	316	78.8
Cranium only	Infans I	-	-	7	7	1.8
	Infans II	-	-	2	2	0.5
	Juvenis	-	-	1	1	0.3
	Adultus	1	6	1	8	2.0
	Maturus	1	3	-	4	1.0
	Senium	-	-	-	-	-
	Undeterminable	-	-	6	6	1.5
	Total:	2	9	17	28	7.0
Postcranial skeleton	Infans I	-	-	8	8	2.0
	Infans II	-	-	6	6	1.5
	Juvenis	-	-	5	5	1.3
	Adultus	8	10	1	19	4.7
	Maturus	5	3	1	9	2.2
	Senium	-	-	-	-	-
	Undeterminable	-	1	9	10	2.5
	Total:	13	14	30	57	14.2
Total		107 (26.7%)	145 (36.2%)	149 (37.1%)	401	

Table 2. Distribution of craniums by sex, age and preservation

Age groups	Measurable		Unmeasurable			Total	
	Male	Female	Male	Female	Undet.	N	%
Infans I	-	-	-	-	54	54	15.9
Infans II	-	-	-	-	29	29	8.6
Juvenis	1	2	-	2	19	24	6.8
Adultus	9	13	25	67	1	115	33.0
Maturus	14	6	45	40	1	106	31.0
Senium	-	1	-	-	-	1	0.3
Undeterminable	-	-	-	-	15	15	4.4
Total	24 (7.0%)	22 (6.4%)	70 (20.3%)	109 (31.7%)	119 (34.6%)	344	

Table 3. Distribution of measurements and indices according to ALEXEYEV & DEBETZ

Martin No.	Classification	♂	♀
	very short	1	-
	short	4	3
1.	medium	9	10
	long	5	5
	very long	4	3
	very short	1	1
	short	4	6
5.	medium	10	5
	long	3	4
	very long	2	2
	very narrow	4	1
	narrow	7	1
8.	medium	10	13
	wide	1	6
	very wide	1	1
	very narrow	1	-
	narrow	3	5
9.	medium	15	13
	wide	5	2
	very wide	-	2
	very narrow	1	2
	narrow	6	1
10.	medium	7	9
	wide	8	5
	very wide	2	5
	very low	-	1
	low	8	4
17.	medium	7	6
	high	5	7
	very high	1	1
	very small	3	-
	small	5	-
38.	medium	9	10
	large	3	5
	very large	-	2
	very short	2	3
	short	8	7
40.	medium	7	3
	long	-	2
	very long	2	1
	very narrow	1	2
	narrow	5	8
43.	medium	8	4
	wide	7	3
	very wide	-	1

Martin No.	Classification	♂	♀
	very narrow	1	2
	narrow	4	3
45.	medium	5	4
	wide	3	3
	very wide	-	-
	very narrow	3	1
	narrow	9	7
46.	medium	8	7
	wide	-	2
	very wide	-	-
	very low	-	1
	low	4	3
47.	medium	5	9
	high	2	2
	very high	-	2
		1	1
	very low	8	4
	low	7	9
48.	medium	4	2
	high	1	2
	very high	-	-
	very narrow	1	1
	narrow	2	6
51.	medium	11	8
	wide	8	2
	very wide	1	1
		-	1
	very low	7	5
	low	11	4
52.	medium	4	6
	high	1	2
	very high	-	-
	very narrow	3	1
	narrow	5	2
54.	medium	9	7
	wide	4	6
	very wide	-	2
		1	-
	very low	2	1
	low	7	5
55.	medium	7	8
	high	4	4
	very high	-	1
	very short	1	2
	short	6	6
62	medium	7	6
	long	6	3
	very long	-	1

Table 3. (continuation 1)

Martin No.	Classification	♂	♀
	very narrow	4	-
	narrow	3	4
63.	medium	9	5
	wide	4	7
	very wide	-	3
		1	-
	very narrow	1	4
	narrow	2	1
65.	medium	5	5
	wide	3	4
	very wide	-	1
	very narrow	-	2
	narrow	3	5
66.	medium	4	8
	wide	3	2
	very wide	1	-
		1	1
	very low	5	7
	low	6	10
69.	medium	4	2
	high	1	-
	very high	1	-
	very small	-	2
	small	6	3
72.	medium	9	9
	large	5	2
	very large	-	1
	very small	7	7
	small	8	4
73.	medium	5	5
	large	-	2
	very large	-	-
	very small	-	1
	small	2	1
74.	medium	5	7
	large	7	6
	very large	6	2
	very small	-	-
	small	4	-
75/1.	medium	4	4
	large	5	5
	very large	-	4
		1	-
	very long	4	-
	long	8	7
8:1	medium	4	10
	short	5	3
	very short	-	1

Martin No.	Classification	♂	♀
		-	1
	very low	2	-
	low	5	2
17:1	medium	8	12
	high	6	3
	very high	-	-
	very low	2	1
	low	1	2
17:8	medium	8	8
	high	4	8
	very high	5	-
	very narrow	1	1
	narrow	3	3
9:8	medium	5	13
	wide	13	4
	very wide	1	1
	very wide	1	1
	wide	1	2
47:45	medium	2	4
	narrow	3	4
	very narrow	-	-
		-	1
		-	1
	very wide	3	3
	wide	6	3
48:45	medium	2	4
	narrow	2	-
	very narrow	-	1
		-	1
	very low	5	4
	low	12	3
52:51	medium	4	10
	high	2	-
	very high	-	-
	very narrow	2	-
	narrow	3	6
54:55	medium	9	3
	wide	4	6
	very wide	2	3
		1	-
	very narrow	2	-
	narrow	5	2
63:62	medium	7	6
	wide	1	5
	very wide	4	5

Table 4. Parameters of male series

Martin No.	N	V	M	s
1	23	168-198	183.35	7.40
1c	23	160-193	180.78	7.61
5	20	93-109	101.90	3.92
8	23	125-150	138.57	5.66
9	24	87-102	95.96	3.55
10	24	107-134	118.75	5.32
17	21	128.143	134.76	4.72
20	22	107-119	113.73	3.21
32	20	71- 88	80.10	4.68
32-	20	64- 79	72.15	4.56
40	19	89-115	97.16	5.89
43	21	98-108	104.71	2.99
45	13	123-140	132.31	5.09
46	20	84- 99	92.95	3.52
47	11	109-128	117.55	6.52
48	21	53- 74	64.66	4.81
51	23	39- 45	42.13	1.63
52	23	29- 36	32.39	1.67
54	21	21- 28	25.14	1.80
55	21	42- 56	50.33	3.47
62	20	39- 50	45.75	2.79
63	21	31- 50	39.38	4.01
65	11	108-125	118.36	5.34
66	11	91-110	99.91	6.16
69	18	23- 39	30.17	3.55
70	19	51- 76	64.16	6.13
71a	21	28- 38	31.19	2.84
72	20	78- 86	81.75	2.43
73	20	77- 86	81.45	2.44
74	20	67- 88	78.20	6.07
75	13	46- 67	55.69	5.88
75/1	13	19- 33	26.54	4.72
8:1	22	66.1- 82.6	76.23	8.19
17:1	21	68.2- 76.9	73.69	5.46
17:8	20	86.7-108.0	97.35	11.41
9:8	23	59.2- 74.4	69.43	6.92
47:45	7	79.8- 96.6	89.93	12.50
48:45	13	45.0- 56.5	50.81	6.91
52:51	23	68.9- 85.7	76.63	8.71
54:55	21	40.7- 66.7	50.09	11.41
63:62	19	66.0-109.1	86.87	21.18
Stature acc. to MANOUVRIER	37	153.2-175.8	164.80	9.96
Stature acc. to BREITINGER	35	162.5-180.6	169.29	7.47

Table 5. Parameters of female series

Martin No.	N	V	M	s
1	21	164-185	174.38	6.05
1c	21	159-189	174.52	7.36
5	18	89-103	96.44	4.45
8	22	125-147	137.09	4.50
9	22	89-103	93.41	3.54
10	22	104-125	115.14	5.10
17	19	115-136	128.68	5.00
20	22	101-116	110.36	3.96
32	18	70- 91	82.33	4.70
32-	18	67- 86	77.44	3.89
40	16	80-103	91.19	5.71
43	18	92-109	99.22	4.05
45	12	114-130	122.58	5.37
46	17	82- 96	89.59	3.96
47	17	91-121	108.88	7.68
48	18	52- 69	61.28	4.55
51	18	35- 43	40.00	1.81
52	18	23- 37	32.00	3.22
54	18	21- 29	25.05	2.10
55	19	44- 54	48.58	2.43
62	18	37- 48	43.28	3.08
63	19	34- 44	39.05	2.61
65	15	100-121	111.40	6.80
66	17	83-101	91.47	5.00
69	20	16- 30	25.70	3.20
70	20	52- 63	57.25	3.45
71a	21	21- 37	28.14	3.80
72	17	75- 87	81.24	3.15
73	18	76- 88	81.33	3.77
74	17	60- 85	74.94	6.04
75	14	45- 61	55.07	4.55
75/1	13	22- 34	27.54	3.95
8:1	21	75.0- 89.3	79.02	6.65
17:1	18	63.5- 78.1	73.67	6.13
17:8	19	81.0-100.0	94.74	8.72
9:8	22	62.8- 73.7	68.18	5.16
47:45	12	77.7-106.1	90.16	13.56
48:45	12	40.0- 60.5	50.42	9.58
52:51	18	65.7- 86.9	80.11	12.18
54:55	18	43.8- 62.0	51.77	10.02
63:62	18	76.3-106.0	91.94	16.40
Stature acc. to MANOUVRIER	36	145.0-161.6	152.69	8.97
Stature acc. to BACH	36	155.1-167.2	159.88	5.82

Table 6. Distribution of morphological characteristics

Characteristics		Male		Female		Total	
		N	%	N	%	N	%
Norma verticalis	Ovoid	5	12.5	6	18.2	11	15.0
	Pentagonoid	9	22.5	17	51.5	26	35.6
	Ellipsoid	1	2.5	-	-	1	1.4
	Sphenoid	12	30.0	5	15.2	17	23.3
	Birsoid	13	32.5	4	12.1	17	23.3
	Romboid	-	-	1	3.0	1	1.4
	Total:	40		33		73	
Glabella	Broca 1	-	-	28	54.9	28	28.0
	Broca 2	-	-	18	35.3	18	18.0
	Broca 3	19	38.8	4	7.8	23	23.0
	Broca 4	7	14.3	1	2.0	8	8.0
	Broca 5	13	26.5	-	-	13	13.0
	Broca 6	10	20.4	-	-	10	10.0
	Total:	49		51		100	
Arcus superciliaris	Broca 1	1	1.8	49	79.0	50	42.4
	Broca 2	19	33.9	12	19.4	31	26.3
	Broca 3	36	64.3	1	1.6	37	31.3
	Total:	56		62		118	
Protuberantia occipitalis externa	Broca 0	1	2.2	21	42.0	22	22.9
	Broca 1	6	13.0	19	38.0	25	26.0
	Broca 2	15	32.6	8	16.0	23	24.0
	Broca 3	15	32.6	2	4.0	17	17.7
	Broca 4	5	10.9	-	-	5	5.2
	Broca 5	4	8.7	-	-	4	4.2
	Total:	46		50		96	
Processus mastoideus	Harsányi -2	4	5.9	41	48.8	45	29.6
	Harsányi -1	10	14.7	24	28.6	34	22.4
	Harsányi 0	15	22.0	11	13.1	26	17.1
	Harsányi +1	25	36.8	6	7.1	31	20.4
	Harsányi +2	14	20.6	2	2.4	16	10.5
	Total:	68		84		152	

Table 6. (continuation)

Characteristics		Male		Female		Total	
		N	%	N	%	N	%
Nasal aperture	1. Infantile	2	5.3	1	2.8	3	4.1
	2. Sulc. praenas.	5	13.2	3	8.3	8	10.8
	3. Fossa praenas.	14	36.8	12	33.3	26	35.1
	4. anthropine	17	44.7	20	55.6	37	50.0
	Total:	38		36		74	
Spina nasalis anterior	Broca 1	-	-	1	12.5	1	4.2
	Broca 2	3	18.8	3	37.5	6	25.0
	Broca 3	6	37.5	3	37.5	9	37.5
	Broca 4	4	25.0	1	12.5	5	20.8
	Broca 5	3	18.7	-	-	3	12.5
	Total:	16		8		24	
Fossa canina	Very small (1)	3	6.8	4	10.8	7	8.6
	Small (2)	17	38.6	12	32.4	29	35.8
	Medium (3)	11	25.0	4	10.8	15	18.5
	Large (4)	8	18.2	11	29.7	19	23.5
	Very large (5)	5	11.4	6	16.2	11	13.6
	Total:	44		37		81	
Alveolar prognathy	Vertical (1)	7	23.3	1	4.0	8	14.5
	Moderate (2)	18	60.0	12	48.0	30	54.5
	Expressed (3)	5	16.7	12	48.0	17	30.9
	Total:	30		25		55	
Teeth wear	Körber 1	14	15.5	26	28.9	39	22.4
	Körber 2	24	28.6	28	31.1	52	29.9
	Körber 3	19	22.6	22	24.4	41	23.6
	Körber 4	27	32.1	14	15.6	41	23.6
	Körber 5	1	1.2	-	-	1	0.5
	Total:	84		90		174	

Table 7. Anatomical variations and abnormalities

Variations		Male	Female	Juv.	Total
Sutura metopica		6 (31,6)	12 (63,1)	1 (5,3)	19
Os apicis		3	8	–	11
Os apicis bipartitum		–	2	1	3
Os apicis tripartitum		1	–	–	1
Os apicis quadripartitum		–	–	1	1
	Total:	4 (25,0)	10 (62,5)	2 (12,5)	16
Ossa Wormiana in sutura lambdoidea	left side	5	10	1	16
	right side	8	3	1	12
	both sides	11	11	1	23
	Total:	24 (47,0)	24 (47,0)	3 (5,9)	51
Ossa wormiana in sutura coronalis	left side	1	1	–	2
	right side	1	–	–	1
	Total:	2 (66,7)	1 (33,3)	–	3
Ossa Wormiana in sutura sagittalis		3 (42,9)	4 (57,1)	–	7
Ossa Wormiana at incisura parietalis	left side	–	1	1	2
	right side	1	–	–	1
	both sides	–	1	–	1
	Total:	1 (25,0)	2 (50,0)	1 (25,0)	4
Os epiptericum	left side	–	–	1	1
	right side	1	–	–	1
	both sides	–	–	1	1
	Total:	1 (33,3)	–	2 (66,7)	3
Bathrocephalia		5 (62,5)	2 (25,0)	1 (12,5)	8
Torus palatinus		2	–	–	2
Os bregmathicum		1	–	–	1
Pin teeth	both sides	–	1	–	1
Shovel shaped		–	–	1	1
Perforatio fossae olecrani humeri	left side	2	7	–	9
	right side	–	7	1	8
	both sides	1	9	–	10
	Total:	3 (11,1)	23 (85,2)	1 (3,7)	27
Processus supracondyloideum	left side	–	1	–	1
	right side	1	–	–	1
	Total:	1 (50,0)	1 (50,0)	–	2
Sacrum bifidum	craniale	4	–	–	4
	caudale	12	11	2	25
	caud + cran	2	–	–	2
	whole	2	–	–	2
	Total:	20 (60,6)	11 (33,3)	2 (6,1)	33
Sacralisatio		4	–	–	4

Table 8. Parameters of the facial flatness - Males

No.	Characteristics	N	V	M	s
1.	Bi-malar chord (43_1)	17	88.0-103.4	97.10	4.10
2.	Bi-malar subtense	17	15.9- 23.7	19.47	2.43
3.	Zygomaxillar chord	17	83.5- 98.9	92.24	3.72
4.	Zygomaxillar subtense	17	21.2- 29.1	25.65	2.40
5.	Dacryal chord (DC)	18	17.9- 26.4	21.50	2.53
6.	Dacryal subtense (DS)	18	10.9- 14.3	12.67	1.04
7.	Simotical chord (SC)	18	5.2- 18.1	9.72	2.97
8.	Simotical subtense (SS)	18	3.0- 6.9	5.06	1.30
9.	Malar chord (C)	14	46.1- 59.0	52.29	3.95
10.	Malar subtense (S)	14	6.5- 11.9	9.64	1.23
11.	Incisure maxillo-malar chord (IMMC)	16	19.0- 29.4	24.00	2.53
12.	Incisure maxillo-malar subtense (IMMS)	16	2.1- 13.2	7.06	3.09
13.	Dacryal index (ID)	18	49.8- 79.3	60.00	7.78
14.	Simotical index (IS)	18	22.1- 69.6	53.72	10.82
15.	Malar arc index (S:C)	14	13.8- 21.7	18.07	1.86
16.	IMM index (IMMS:IMMC)	16	7.7- 56.5	30.06	12.96
17.	Nasomalar angle	17	130.0-145.6	136.70	4.15
18.	Zygomaxillar angle	17	112.5-130.2	122.10	5.27
19.	Fossa canina	18	1.8- 8.8	4.56	3.60

Table 9. Parameters of the facial flatness - Females

No.	Characteristics	N	V	M	s
1.	Bi-malar chord (43_1)	16	85.0- 99.8	92.69	4.10
2.	Bi-malar subtense	16	11.5- 23.3	17.56	2.66
3.	Zygomaxillar chord	15	81.6- 95.9	88.93	4.17
4.	Zygomaxillar subtense	15	19.5- 30.8	24.47	2.34
5.	Dacryal chord (DC)	16	16.1- 25.2	20.25	3.00
6.	Dacryal subtense (DS)	16	9.4- 14.7	11.63	1.55
7.	Simotical chord (SC)	16	7.1- 13.8	9.63	2.03
8.	Simotical subtense (SS)	16	3.0- 6.1	4.63	1.03
9.	Malar chord (C)	14	45.0- 53.0	47.21	2.64
10.	Malar subtense (S)	14	7.0- 12.9	9.21	1.72
11.	Incisure maxillo-malar chord (IMMC)	15	15.6- 28.8	22.67	3.54
12.	Incisure maxillo-malar subtense (IMMS)	15	4.4- 13.9	6.93	2.80
13.	Dacryal index (ID)	16	41.7- 75.2	57.63	7.92
14.	Simotical index (IS)	16	35.7- 68.2	49.56	8.77
15.	Malar arc index (S:C)	14	15.4- 25.5	19.00	2.76
16.	IMM index (IMMS:IMMC)	14	18.6- 53.6	26.36	8.71
17.	Nasomalar angle	16	130.0-150.6	138.25	5.07
18.	Zygomaxillar angle	15	110.0-129.1	122.47	5.89
19.	Fossa canina	16	1.5- 8.5	4.56	3.70

Table 10. Taxonomical analysis

Types		Male	Female	Total
Nordoids	n	2	-	2
	n-x	2	5	7
	n-crA	1	1	2
	n-cr(x)	-	1	1
		5 (12.8%)	7 (17.9%)	12 (30.8%)
Brachycranials	p	2	-	2
	ar	-	1	1
	undet. br	2	1	3
	undet. br-x	2	2	4
		6 (15.4%)	4 (10.3%)	10 (25.6%)
Cromagnoids	crA	1	-	1
	crA-x	2	1	3
	crB	1	1	2
	crB-x	1	-	1
		5 (12.8%)	2 (5.1%)	7 (17.9%)
Mediterraneans	m	3	-	3
	m-x	1	1	2
	am	1	-	1
	am-x	-	1	1
		5 (12.8%)	2 (5.1%)	7 (17.9%)
Chamaecranic - Europids		2 (5.1%)	1 (2.6%)	3 (7.7%)
	Total:	23 (59.0%)	16 (41.0%)	39

Table 11. Size-, shape- and generalized PENROSE-distance of different male series from Vác-Kavicsbánya

No.	Series	C_Q^2	C_H^2	D_p^2
Vác-K-males				
1.	Alattyán-Tulát, 7-8th c.	0.26	0.70	7.68
2.	Ártánd, 8-9th c.	0.27	0.58	5.84
3.	Csákberény, 6-7th c.	0.004	0.26	4.09
4.	Előszállás-Bajcsihegy, 6-7th c.	0.17	0.72	9.22
5.	Fehértó-A, 9th c.	0.08	0.49	6.77
6.	Fészerlak-Puszta, 8th c.	0.40	0.54	3.56
7.	Homokmégy-Halom, 8-9th c.	0.06	0.58	8.37
8.	Kecel I, 8th c.	0.02	0.63	9.63
9.	Keszthely, 7-8th c.	0.14	0.25	2.23
10.	Kékesd, 8-9th c.	0.17	0.51	5.94
11.	Környe, 6-7th c.	0.07	0.32	4.08
12.	Madaras-Téglavető, late avar	0.07	1.19	17.85
13.	Pókaszepetk, 7th c.	0.02	0.36	5.41
14.	Szebény, 8th c.	0.05	0.26	3.46
15.	Szeged-Kundomb, medium avar	0.02	0.38	5.59
16.	Szekszárd-Palánk, early avar	0.21	0.59	6.71
17.	Szentes-Kaján, 7-8th c.	0.19	0.66	8.06
18.	Tiszavasvári, early avar	1.42	1.92	12.54
19.	Üllő I, 8th c.	0.004	0.60	9.29
20.	Üllő II, 8th c.	0.0002	0.64	9.94
21.	Váchartyán 7-8th c.	0.02	0.45	6.84

Table 12. Size, shape- and generalized PENROSE-distance of different female series from Vác-Kavicsbánya

No.	Series	C_Q^2	C_H^2	D_p^2
Vác-K females				
1.	Alattyán-Tulát, 7-8th c.	0.13	0.52	6.53
2.	Ártánd, 8-9th c.	0.24	0.46	4.23
3.	Csákberény, 6-7th c.	0.03	0.28	4.02
4.	Előszállás-Bajcsihegy, 6-7th c.	0.06	0.45	6.31
5.	Fehértó-A, 9th c.	0.09	0.49	6.55
6.	Fészerlak-Puszta, 8th c.	0.34	0.65	6.06
7.	Homokmégy-Halom, 8-9th c.	0.003	0.40	6.21
8.	Kecel I, 8th c.	0.01	0.49	7.49
9.	Keszthely, 7-8th c.	0.70	0.83	4.47
10.	Kékesd, 8-9th c.	0.19	0.42	4.28
11.	Környe, 6-7th c.	0.02	0.70	10.70
12.	Madaras-Téglavető, late avar	0.06	0.83	12.26
13.	Pókaszepetk, 7th c.	0.16	0.34	3.30
14.	Szebény, 8th c.	0.16	0.56	6.83
15.	Szeged-Kundomb, medium avar	0.006	0.33	5.04
16.	Szekszárd-Palánk, early avar	0.12	0.52	6.59
17.	Szentes-Kaján, 7-8th c.	0.31	0.98	11.57
18.	Tiszavasvári, early avar	1.36	1.66	9.32
19.	Üllő I, 8th c.	0.02	0.68	10.42
20.	Üllő II, 8th c.	0.01	0.39	6.03
21.	Váchartyán, 7-8th c.	0.01	0.45	6.94

Table 13. Some comparative indices of the neuro- and splanchnocranium
Males

Series	N	17x100 / (1+8):2	48x100 / 17	52x100 / 17	54x100 / 45
1. Alattyán-Tulát	110	78.4	53.2	26.1	19.3
2. Ártánd	37	80.8	52.2	24.8	17.5
3. Csákberény	16	81.5	52.9	25.6	18.1
4. Előszállás-Bajcsihegy	34	80.7	53.0	27.1	19.9
5. Fehértó-A	79	81.8	53.9	26.2	19.2
6. Fészerlak-Puszta	10	85.2	49.1	24.9	19.0
7. Homokmégy-Halom	36	81.4	54.2	24.8	18.6
8. Kecel I	26	79.4	54.5	25.3	18.9
9. Keszthely	18	82.6	50.9	24.1	18.7
10. Kékesd	20	84.1	50.9	25.6	19.2
11. Környe	14	83.6	50.5	23.9	19.4
12. Madaras-Téglavető	18	80.8	58.3	25.8	18.0
13. Pókaszepetk	23	86.3	49.2	22.3	19.5
14. Szebény	29	81.6	52.1	25.1	18.7
15. Szeged-Kundomb	64	79.1	53.2	25.4	18.9
16. Szekszárd-Palánk	25	83.0	51.6	24.1	18.8
17. Szentes-Kaján	50	84.8	51.9	25.6	19.4
18. Tiszavasvári	21	85.9	51.9	25.1	19.0
19. Üllő I	54	80.0	54.9	25.1	19.3
20. Üllő II	28	79.7	53.8	24.3	18.9
21. Váchartyán	10	80.4	52.2	25.8	18.5
22. Vác-Kavicsbánya	24	83.7	48.0	24.0	19.0

Table 14. Some comparative indices of the neuro- and splanchnocranium
Females

Series	N	17x100 / (1+8):2	48x100 / 17	52x100 / 17	54x100 / 45
1. Alattyán-Tulát	101	78.1	52.9	27.0	19.7
2. Ártánd	27	81.5	49.8	25.4	19.0
3. Csákberény	7	81.4	51.7	27.2	19.1
4. Előszállás-Bajcsihegy	30	82.2	51.8	27.5	21.2
5. Fehértó-A	78	80.0	54.1	27.5	19.9
6. Fészerlak-Puszta	16	83.0	50.9	26.0	20.4
7. Homokmégy-Halom	34	79.2	52.5	25.8	19.2
8. Kecel I	19	78.5	53.2	26.3	19.2
9. Keszthely	25	81.7	50.9	26.1	20.4
10. Kékesd	10	84.2	49.8	26.5	20.7
11. Környe	6	83.3	51.3	25.1	18.3
12. Madaras-Téglavető	23	77.2	56.9	28.3	20.0
13. Pókaszepetk	18	85.1	48.9	24.7	20.4
14. Szebény	10	81.3	50.6	26.5	19.4
15. Szeged-Kundomb	68	79.2	52.5	26.1	19.2
16. Szekszárd-Palánk	35	82.7	51.5	25.7	19.1
17. Szentes-Kaján	22	81.7	53.6	28.2	19.8
18. Tiszavasvári	29	85.2	50.9	26.1	20.6
19. Üllő I	45	79.6	54.2	26.3	19.5
20. Üllő II	34	80.4	52.9	25.7	19.7
21. Váchartány	14	78.8	52.2	26.8	18.3
22. Vác-Kvicsbánya	22	82.6	47.6	24.9	20.4

Table 15. Comparison of some male series

Series	NM	ZM	DC	DS	SC	SS	75_1
1.+ Alattyán-Tulát	138.6	126.8	22.0	12.3	9.8	5.2	31.0
2.+ Ártánd	137.9	124.9	20.3	13.0	9.4	5.0	34.3
3.+ Csákberény	137.5	124.0	20.5	12.8	8.9	4.9	33.5
4.+ Előszállás-Bajcsihegy	140.8	126.3	22.2	11.8	9.1	4.8	29.6
5.+ Homokmégy-Halom	139.6	126.2	21.0	12.6	9.2	4.8	31.7
6.+ Kecel I	138.1	124.9	21.2	13.1	10.1	5.2	34.2
7.+ Kékesd	139.5	126.6	20.7	12.8	9.7	4.7	30.5
8.+ Környe	136.7	123.0	20.6	13.2	9.4	5.1	28.0
9.+ Szebény	139.5	123.4	21.0	13.0	8.7	4.9	29.0
10.+ Szentes-Kaján	138.8	124.9	20.7	12.8	9.6	5.0	30.1
11.+ Üllő I	138.4	122.5	22.0	12.7	8.7	4.6	28.5
12.+ Üllő II	138.3	126.2	22.4	12.7	9.9	5.1	30.0
13.+ Váchartyán	145.3	125.8	21.1	11.1	7.4	3.6	25.8
14. Vác-Kavicsbánya	136.7	122.1	21.5	12.7	9.7	5.1	26.5
15. Avars (7-8th c.) (TÓTH 1958)	138.3	124.8	21.5	12.5	9.4	4.9	29.0
16. Europoids (TÓTH 1958)	137.0	125.4	-	13.0	-	5.0	33.0
17. Mongoloids (TÓTH 1958)	148.6	141.6	-	8.3	-	2.2	17.6
18. Conquering Hungarians (TÓTH 1965)	139.1	128.2	20.8	12.7	8.8	4.9	29.1

Table 16. Comparison of some female series

Series	NM	ZM	DC	DS	SC	SS	75_1
1.+ Alattyán-Tulát	138.1	124.7	21.1	11.3	9.4	4.5	28.7
2.+ Ártánd	140.9	127.7	21.2	11.4	9.4	4.2	25.7
3.+ Csákberény	140.4	124.0	19.8	10.6	8.5	4.0	26.5
4.+ Előszállás-Bajcsihegy	136.4	123.0	20.4	11.5	9.6	4.5	30.8
5.+ Homokmégy-Halom	138.6	122.5	20.6	11.4	9.1	4.5	31.0
6.+ Kecel I	137.8	122.1	20.4	11.4	9.2	4.2	29.0
7.+ Kékesd	139.5	125.2	21.1	10.8	9.6	3.9	31.6
8.+ Környe	137.0	122.7	18.6	11.2	7.9	4.2	22.6
9.+ Szebény	140.2	121.1	22.2	11.0	11.0	4.7	34.0
10.+ Szentes-Kaján	137.6	123.6	20.3	11.7	9.4	4.4	28.4
11.+ Üllő I	141.4	127.9	20.5	10.2	8.6	3.9	21.5
12.+ Üllő II	139.1	125.3	20.9	11.4	9.2	4.3	27.1
13.+ Váchartyán	140.5	125.4	20.1	10.2	9.0	4.4	28.5
14. Vác-Kavicsbánya	138.3	122.5	20.3	11.6	9.6	4.6	27.5
15. Avars (7-8th c.) (TÓTH 1958)	140.0	125.8	20.7	10.7	9.0	4.2	25.6
16. Europoids (TÓTH 1958)	137.0	125.4	-	13.0	-	5.0	33.0
17. Mongoloids (TÓTH 1958)	148.6	141.6	-	8.3	-	2.2	17.6
18. Conquering Hungarians (TÓTH 1965)	140.9	131.2	20.1	11.3	9.2	4.1	25.9

+ TÓTH 1970

Table 17. Comparison of the PFC and IC values of some series

No.	Series	N	PFC	IC
1+	Alattyán-Tulát, 7-8th c.	211	91.7	4.7
2+	Ártánd, 8-9th c.	64	90.5	5.8
3+	Csákberény, 6-7th c.	21	91.3	5.5
4+	Előszállás-Bajcsihegy, 6-7th c.	64	90.4	7.0
5+	Homokmégy-Halom, 8-9th c.	70	91.8	4.2
6+	Kecel I, 8th c.	45	92.2	-1.8
7+	Kékesd, 8-9th c.	30	88.6	11.2
8+	Környe, 6-7th c.	20	88.8	3.4
9+	Szebény, 8th c.	39	91.3	1.8
10+	Szentes-Kaján, 7-8th c.	72	90.3	3.2
11+	Üllő I, 8th c.	83	93.5	19.7
12+	Üllő II, 8th c.	48	91.4	7.1
13+	Váchartyán, 7-8th c.	25	92.9	22.8
14.	Vác-Kavicsbánya, 7-8th c.	46	88.2	-6.2
15.	Europoids; Medieval Epoch North Region SU (DEBETZ 1961)	1771	89.9	10.6
16.	Europoids; Medieval Epoch, South Region SU (DEBETZ 1961)	251	90.0	4.1
17.	Europo-mongoloids; Sarmatian period, North Region SU (DEBETZ 1961)	277	91.6	34.0
18.	Mongoloids; Early Iron Age, SU (DEBETZ 1961)	25	97.7	85.8
19.	Conquering Hungarians (10th c.) (DEBETZ 1964, TÓTH 1965, 1969)	122	91.5	17.0

+TÓTH 1973

Sequences of series of Figures 1-14 are the same as in Table 13

Sequences of series of Figures 15-26 are the same as in Table 15

Sequences of series of Figure 17 is the same as in Table 17

Figs. 1-2. Comparison of male series

Figs. 3-4. Comparison of male series

Figs. 5-6. Comparison of male and female series

Figs. 7-8. Comparison of female series

Figs. 9-10. Comparison of female series

Figs. 11-12. Correlation of male series

Figs. 13-14. Correlation of female series

Figs. 15-16. Comparison of some male series

Figs. 17-18. Comparison of some male series

Figs. 19-20. Comparison of some male series

Figs. 21-22. Comparison of some female series

Figs. 23-24. Comparison of some female series

Figs. 25-26. Comparison of some female series

Fig. 27. Comparison of some craniological series

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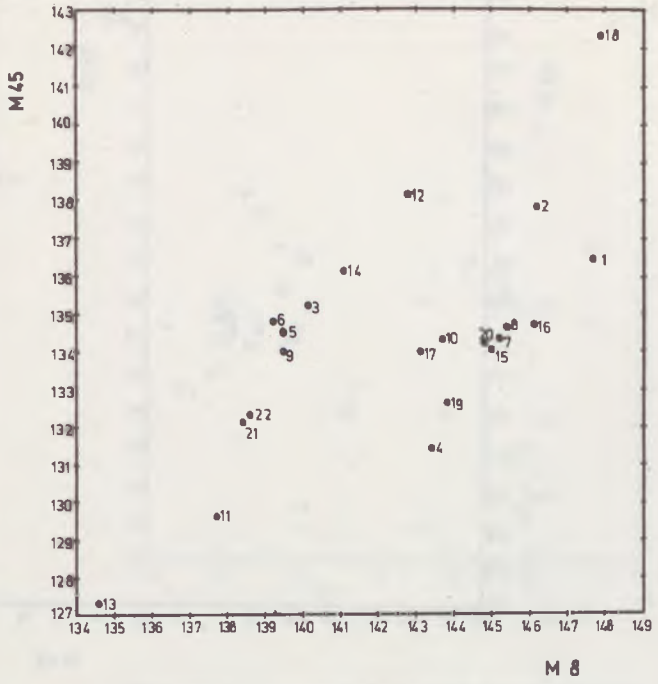
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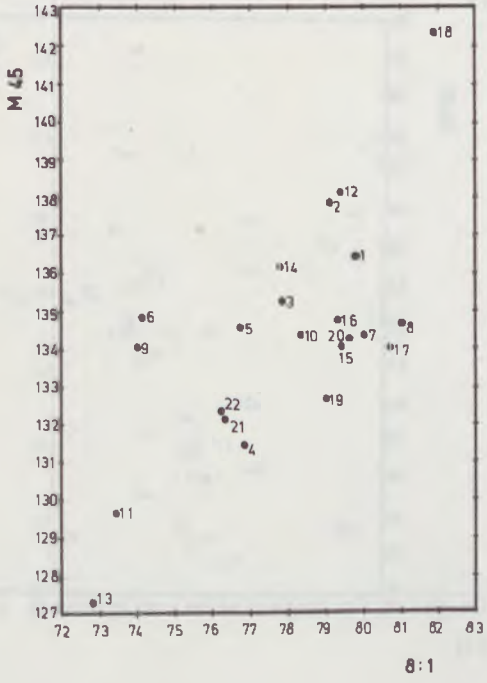
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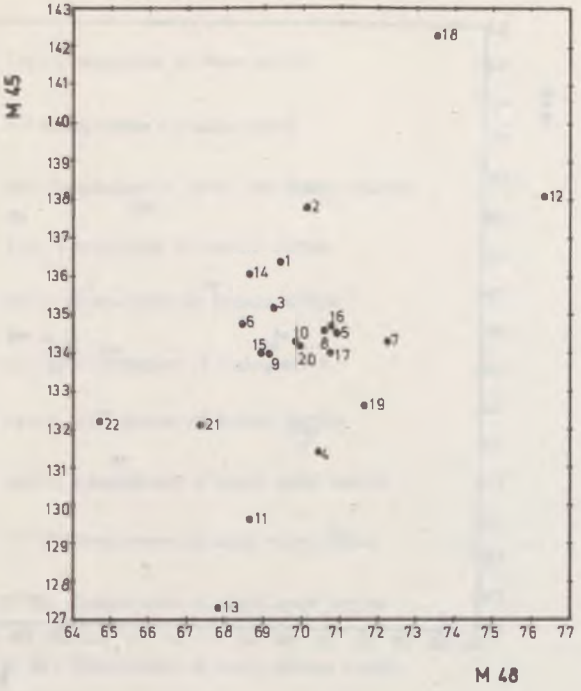

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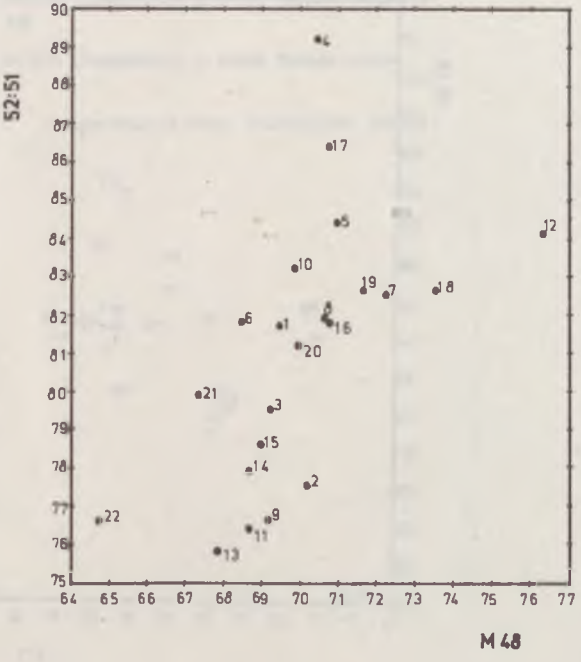

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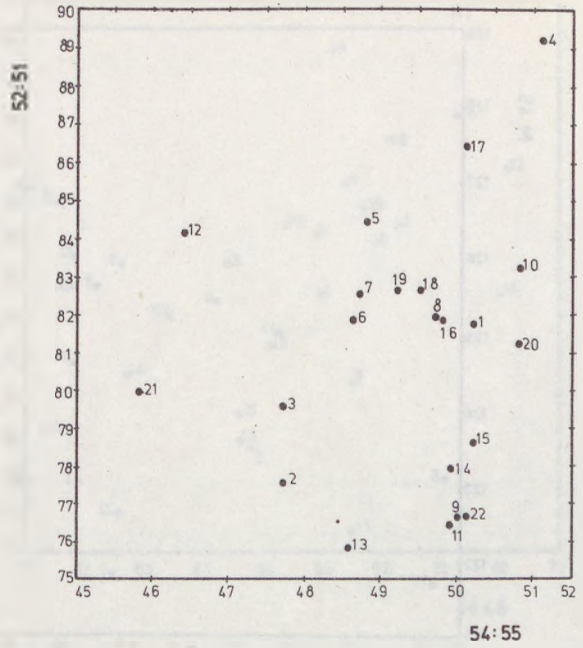
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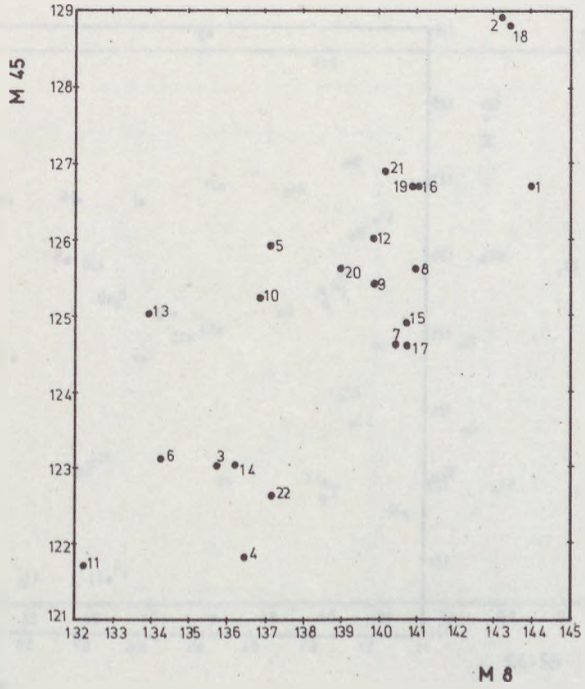
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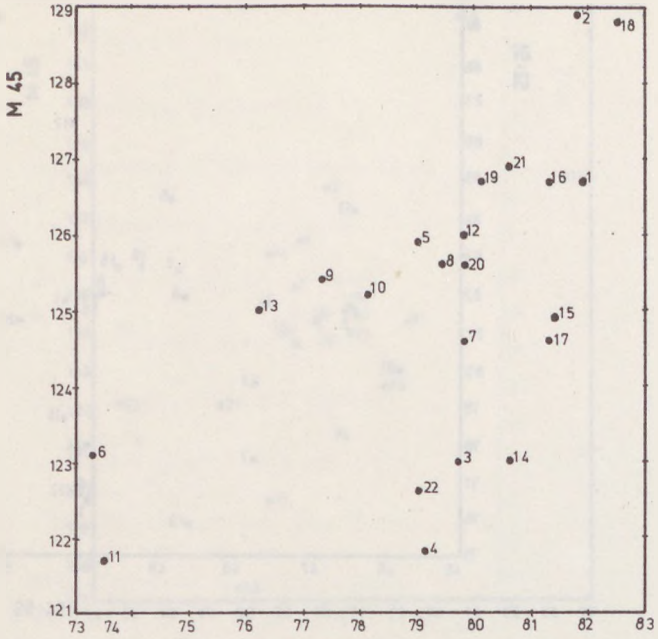
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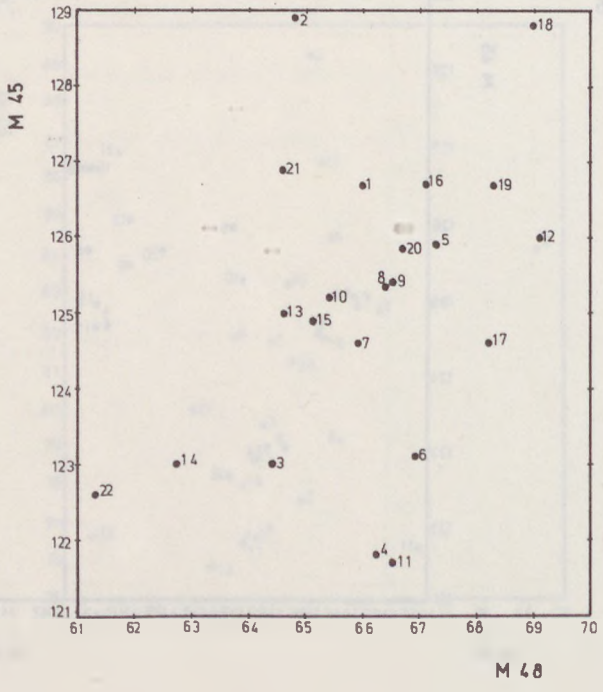
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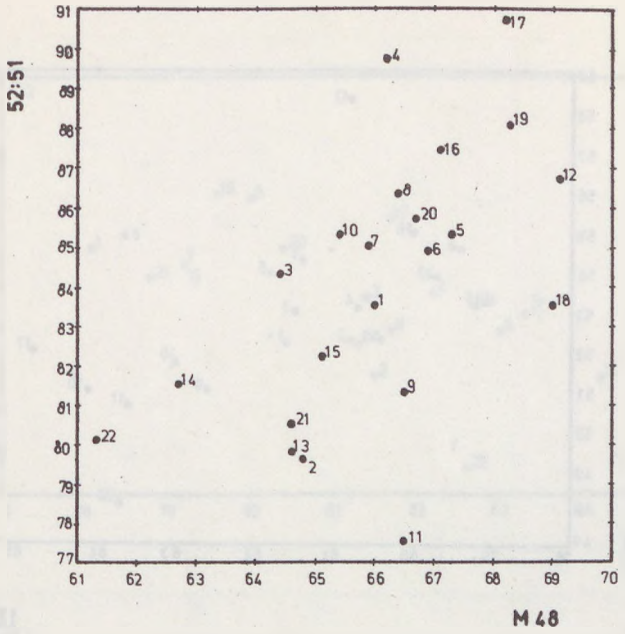
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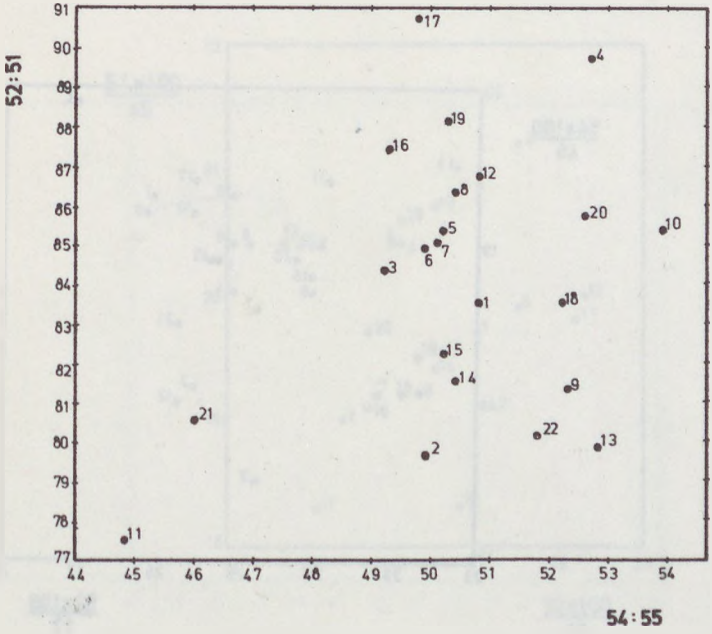
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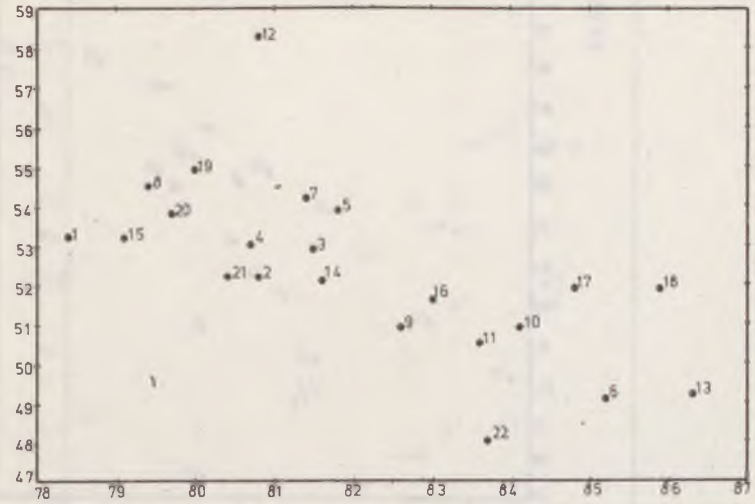

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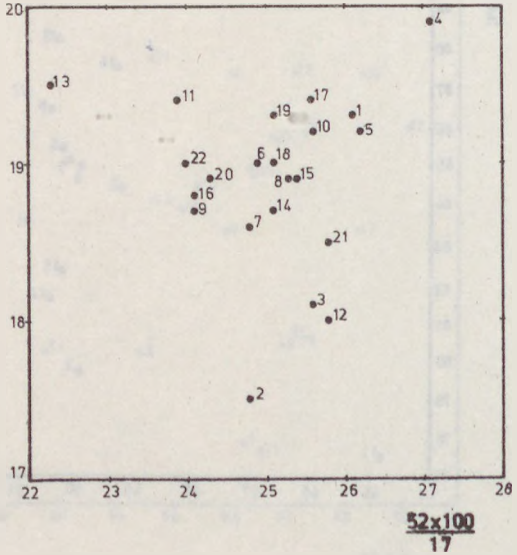

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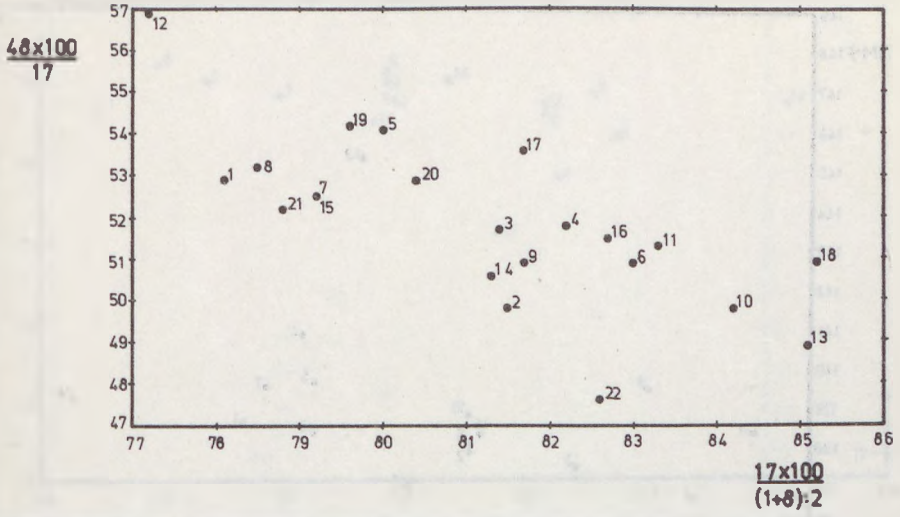
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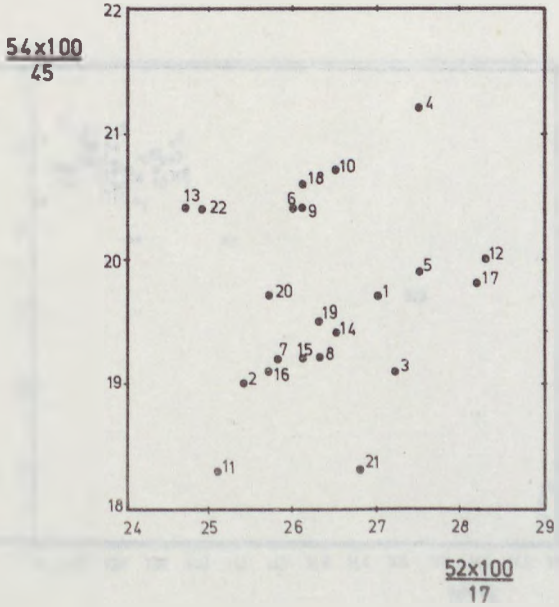
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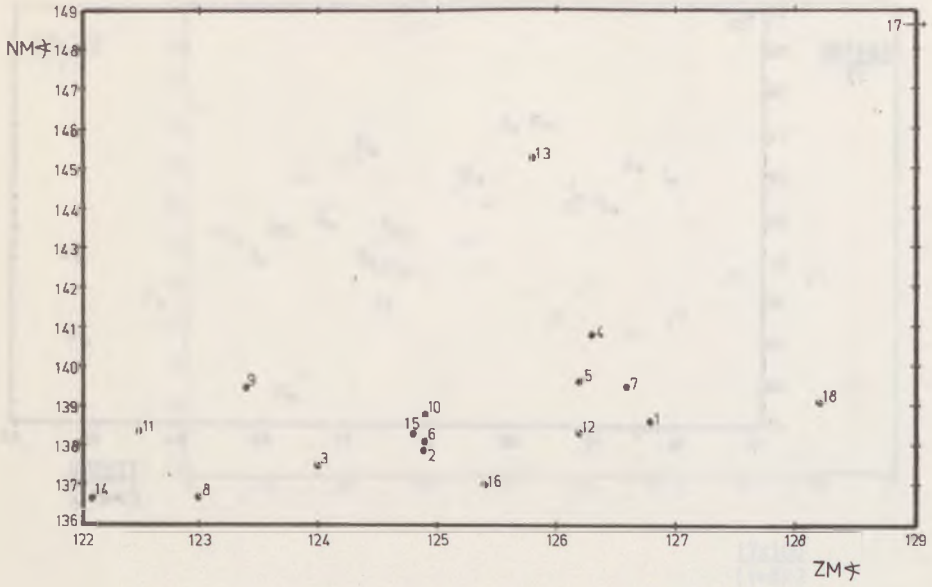
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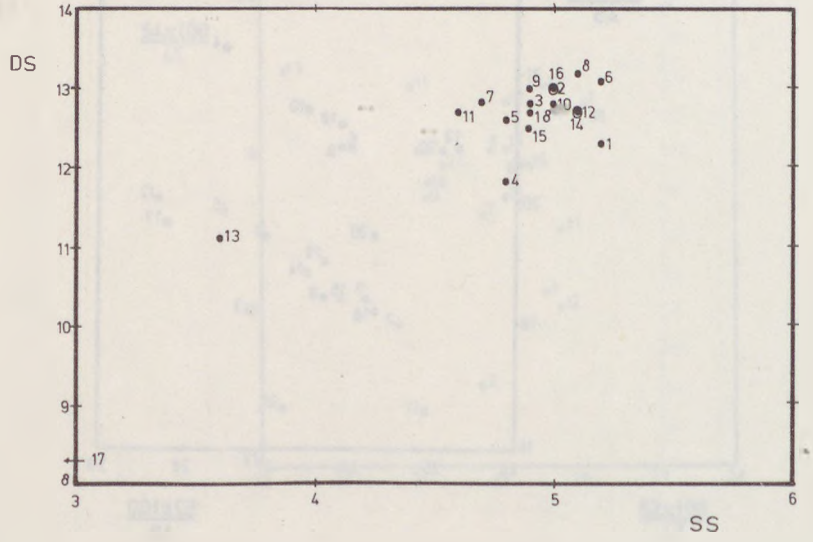
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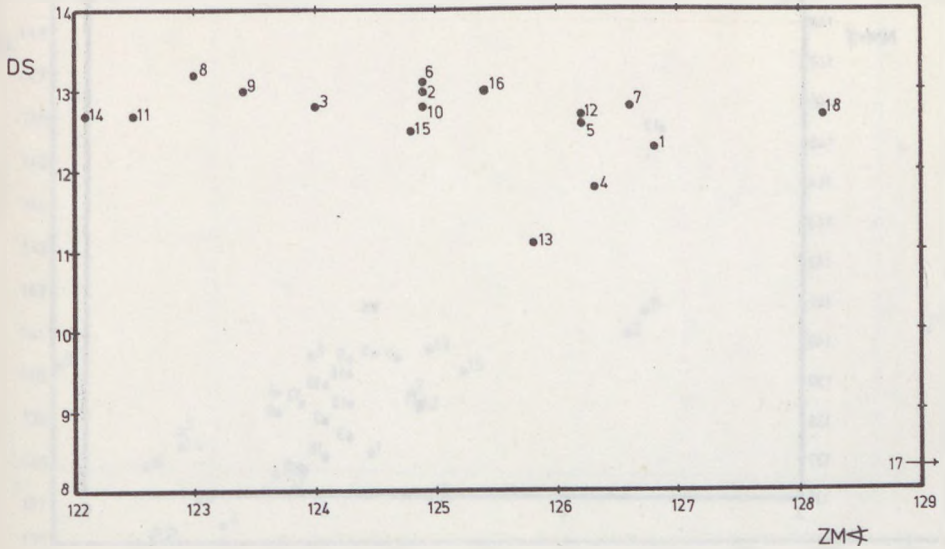
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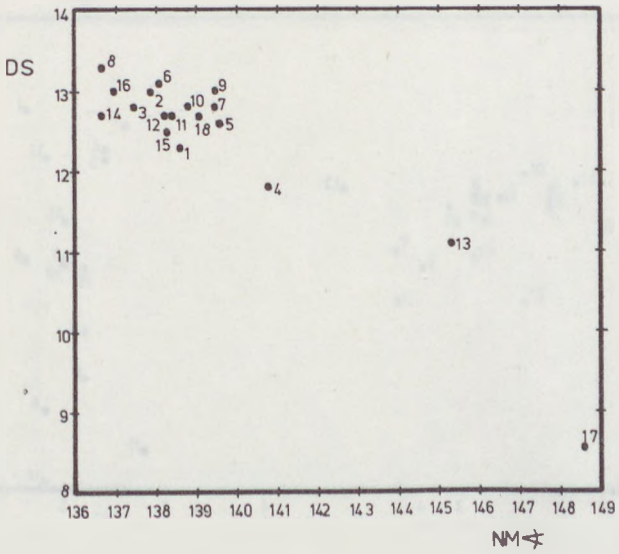
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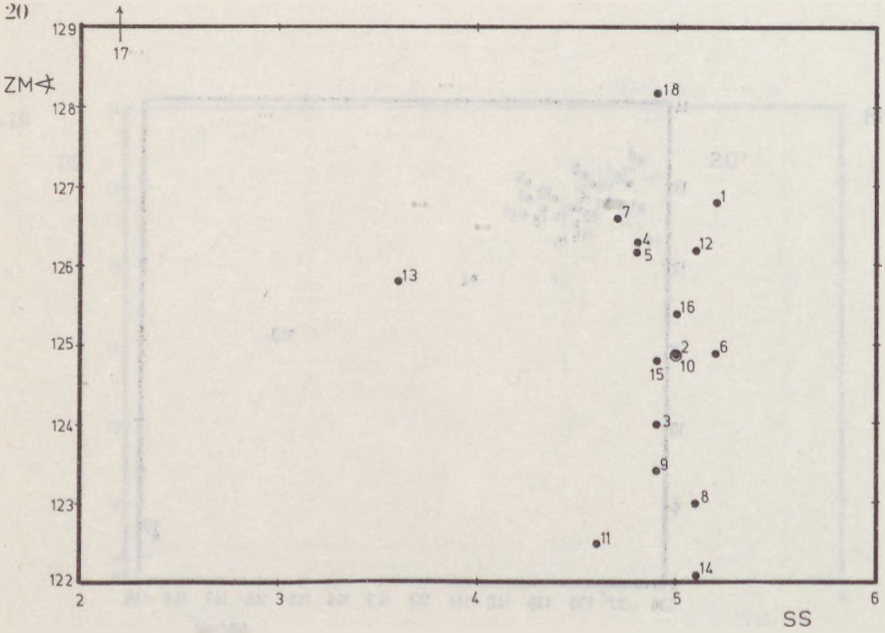
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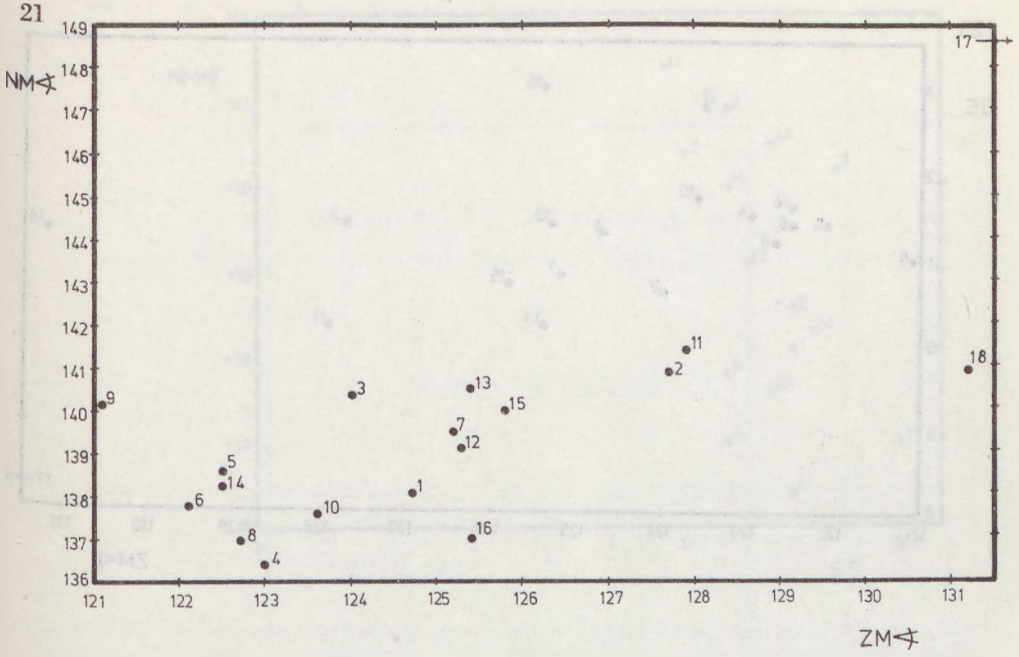
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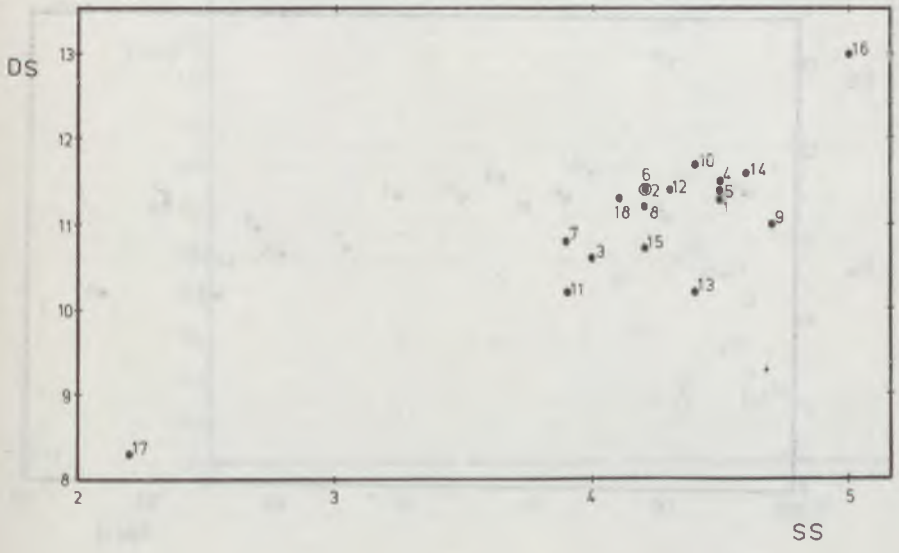
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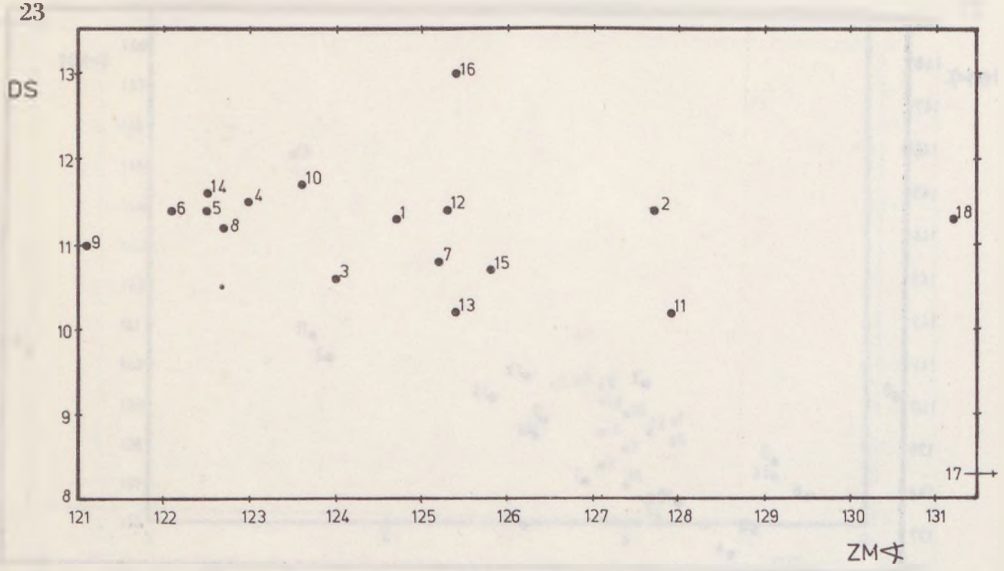
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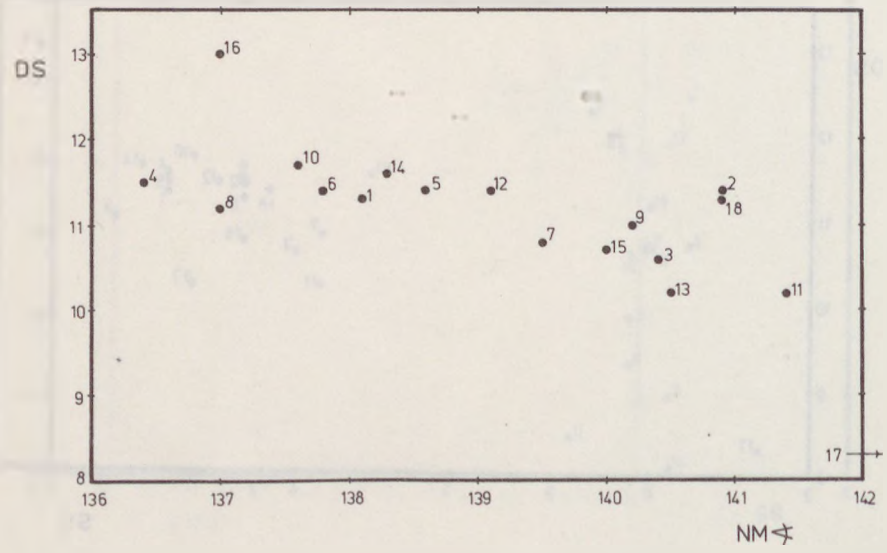
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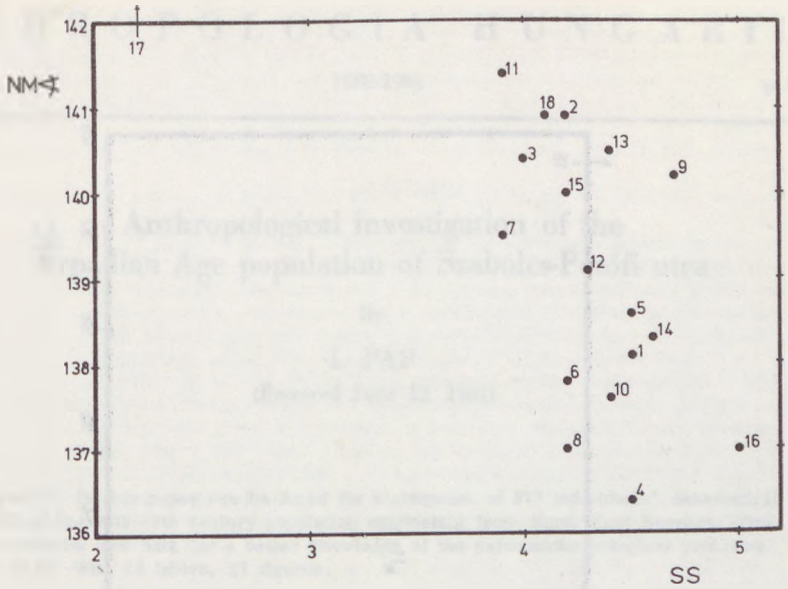
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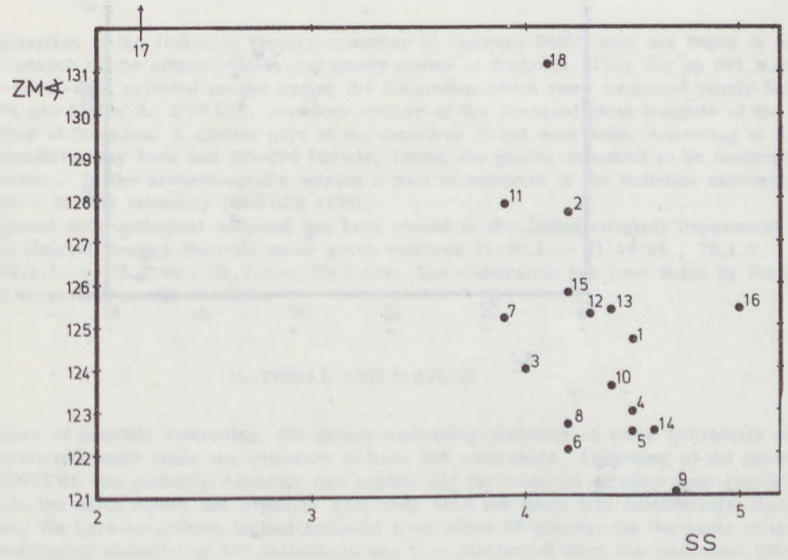
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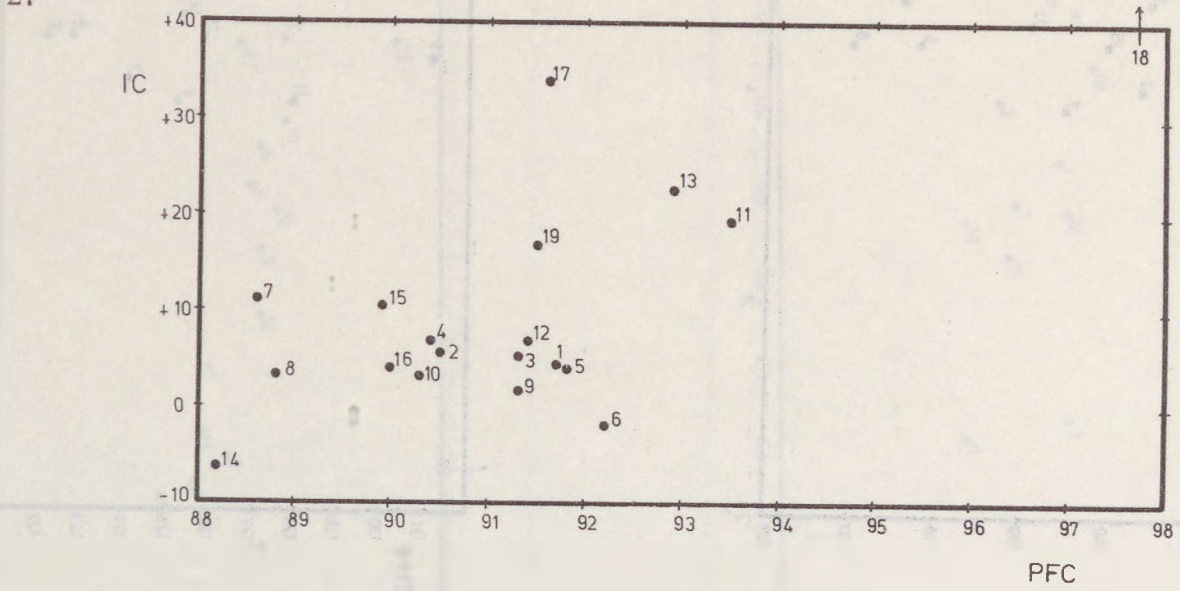
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ANTHROPOLOGIA HUNGARICA

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Anthropological investigation of the Arpadian Age population of Szabolcs-Petőfi utca

By

I. PAP

(Received June 12, 1981)

Abstract: In this paper can be found the elaboration of 377 individuals' osteological material of the 10th-12th century population originating from North-East Hungary. The author provides new data for a better knowledge of the palaeoanthropological problems of this area. With 15 tables, 27 figures.

There are only two Arpadian Age cemeteries have been elaborated up till now (Gáva-Vásártér, Tiszalök-Rázompuszta) from this territory of North-East Hungary abounding in archaeological sites of the age of Conquering Hungarians. Therefore it is very important to study the anthropological findings of the Arpadian Age population of this area.

THE CIRCUMSTANCES OF THE EXCAVATION

The excavation of the 10th-12th century cemetery of Szabolcs-Petőfi-utca has begun in connection with the search of the administration and power centre at Szabolcs. They dug up 391 mainly South-West—North-East oriented graves during the excavation which were continued yearly between 1969 and 1974 and led by L. KOVÁCS, research worker of the Archaeological Institute of the Hungarian Academy of Sciences. A certain part of the cemetery is not excavated. According to KOVÁCS, the cemetery may have had 500-600 burials, taking the graves supposed to be destroyed into consideration. In the archaeologist's opinion a part of servants of the Szabolcs earthwork have been buried in this cemetery (KOVÁCS 1976).

The rescued anthropological material has been placed in the Anthropological Department of the Hungarian Natural History Museum under grave numbers 71.16.1. - 71.16.35., 72.1.1. - 72.1.145., 72.4.1. - 72.4.60., 79.3.1. - 79.3.144. The elaboration has been made by the graves numbers because of easier to work.

MATERIAL AND METHOD

An account of possible destroying, the graves containing skeletons of some individuals and the further scattered bones made the cemetery to have 403 individuals. According to the investigations of LENGYEL two probably Arpadian Age graves and the material of other four graves had been taken into the earth before the Arpadian Age, they were not taken into consideration during the elaboraton. We have no anthropological material from other 20 graves. On the basis of these things the osteological material of 377 individuals has been elaborated from the excavated 391 graves.

125 of them are those of children and juvenile ones. Of the 244 grown-ups, 26 male and 14 female crania have been suitable morphological and metrical analysis. We were able to measure 51 males' and 46 females' postcranial skeleton. We have analysed the primary taxonomical characters on 16 male and 9 female crania, the secondary taxonomical characters on 14 male and 8 female ones.

Because of their being fragmentary and incomplete 8 individuals' age and sex are indeterminable.

We have identified the sex on the basis of the anatomical characters of the cranium and the skeleton.

In case of children we have made the age at the time of the death by investigating the eruption of deciduous and permanent teeth. In establishing the age in case of grown-ups we have taken into consideration the ossification os sutures on the endocranial surface of the cranium and the VALLOIS' grades of the suture ossification of the ectocranial surface as well as degree of abrasio (after KÖRBER). We have considered the ossification of the epiphyses on the postcranial bones, as well as the surface changing of the facies symphyseos ossis pubis (FARKAS 1972). In the relating evaluations, we have taken into consideration the MARTIN & SALLER (1957) age groups.

In taking of absolute measurements we have followed the MARTIN-technique (1928). In the examination of facial flatness we have used the DEBETS & TÓTH method (FARKAS (1972). Measurements and indices have been classified according to ALEXEYEV & DEBETS (1964) and facial profile has been evaluated according to the works of DEBETS (ALEXEYEV & DEBETS 1964) and TÓTH (1958, 1967, 1968, 1969). In the analysis of secondary taxonomical characters we have used LIPTÁK's works (1954, 1957, 1965, 1969). In taking of measure of long bones we have followed the ALEXEYEV-method (1966).

Table 1. Distribution of sex, age and preservation

Characterization of the material	Age group	♂	♀	Undet. sex	Total
Cranium and skeleton	Infans I.	-	-	42	42
	Infans II.	-	-	17	17
	Juvenis	-	-	30	30
	Adultus	50	70	-	120
	Maturus	42	23	-	65
	Senium	2	1	-	3
	Total	94	94	89	277
Cranium	Infans I.	-	-	16	16
	Infans II.	-	-	3	3
	Juvenis	-	-	3	3
	Adultus	2	5	-	7
	Maturus	3	-	-	3
	Total	5	5	22	32
Skeleton	Infans I.	-	-	5	5
	Infans II.	-	-	4	4
	Juvenis	-	-	5	5
	Adultus	17	15	-	32
	Maturus	6	8	-	14
	Total	23	23	14	60
Undeterminable		-	-	8	8
Total		122	122	133	377

In the comparison of the different series we have applied the combination of measurements and indices, the various taxonomical analysis given by several authors. We compared the diameter avarages of some series, applying ALEXEYEVA's special indices (1966), as well as the praeauricular faciocerebral index values of DEBETS (1964) and the facial flatness index (DEBETS & TÓTH method, in FARKAS 1972).

SEX AND AGE DETERMINATION

The determination of sex and age have been examined by biochemical method in case of 391. The investigations have been made by LENGYEL.

The determination of sex have been examined both of methods (morphological and biochemical) in 245 cases. From these 8 cases were inconsistent (Table 2). According to the biochemical determination 3 male and 5 female skeletons proved to have contrasted sex identification by the morphological analysis. The agreement of the two methods is 96.73%.

The age could be identified in 366 cases by both methods. Here we experienced contradiction in the cases of 11.2% (Table 2). The trends of the dissimilar data in these 41 cases is quite homogeneous, so in 33 cases the morphological, and 8 cases the biochemical analysis gave higher age. The divergence was fully opposite only 1 case, when an individual belonging to the infans II. group by the biochemical method, proved to be adultus by the morphological investigation. In the other cases the determined age-groups were joined with one and other marginally. According to LENGYEL's opinion the different values of both methods could be caused by decompositional factors and pathological changes.

The morphologically and chemically analysed age-group were in keeping with each other in 61.54% in the anthropological material of an Early-Bronze Age cemetery, having been examined by LENGYEL & FARKAS (1972). In our cemetery this rate is 88.80%. According to the authors' opinion the data of chemical identification may be accepted when they agree with each other in 76.92%. They have found an agreement in such measure in adultus age.

According to LENGYEL (in: SZABÓ 1980), the average reliable value of data is 75-80% in the sex and 65-70% is in the identifying of the age. Our cemetery shows higher values than reliable one were indicated above (sex: 96.73%, age: 88.80%).

On the basis of all those, in those cases when the sex or the age is undecied or could not be determined exactly, we used the result of the biochemical investigation. In other cases we have taken into consideration the results of morphological investigations.

PALAEODEMOGRAPHICAL ANALYSIS

The distribution of sex and age of our material can be found in the Table 1.

It can be established, that the proportion of the children and the juvenile-group altogether (33.16%) is the most higher in the age-group of infans I. (16.71%). In spite of this it does not reach the 33.7% proportion, elaborated by palaeodemographical investigations of ACSÁDI (1965). This fact can be explained with the uncompletely excavation of the cemetery in one hand, and the other hand with the destroying of children's graves in greater part (TÓTH 1961).

The number of male and female skeletons are equal at the adultus. The most people had died in their adult age, but the proportion of deaths is more unfavourable at the females than the males. The 73.77% of females and the 56.56% of males had died in their adult age, and the 41.8% of males and the 25.41% of females had been living to the maturus age.

GENERAL ANTHROPOLOGICAL ANALYSIS

Males: Brain-case according to the mean-values is mediumlong-long, mediumwide, mediumhigh. Brain-case according to the calculated indices is dolichocranic (but according to the distribution hyperdolicho-, dolicho- and mesocranic are in nearly equal), orthocranic, metriocranic (but acrocranic is in 43%), metriometopic (Tables 4, 5). Circumference of most of skulls in norma

verticalis is pentagonoid and ovoid. Glabella is medially developed, generally of degre 3. Arcus superciliaris is strong. Protuberantia occipitalis externa is medially developed, generally of degrees 2 and 3. Processus mastoideus is medially or strongly developed (Table 3).

Facial skeleton's characteristics as follows: zygomatic arc is narrow or mediumwide with medium bizygomatic breadth. Face is mediumhigh, upper face is also (low and mediumlow face is nearly same rate). Orbita is wide (wide and very wide is in nearly same rate), low. Nose is mediumwide (narrow is the most frequent), mediumhigh (low nose is in nearly same rate). According to the indices, facial skeleton is mesoprosopic, mesen. Orbita chamaeconch (but hypercha-maecorch is the most frequent). Nose is mesorrhine. Palate is brachystaphyline (Tables 4, 5). Orbita is usually rectangular, but the subrectangular form is frequent. Lower edge of nasal aperture is mostly anthropine, but the infantile form is frequent. Spina nasalis anterior is medially - strongly developed, generally of degre 4. Fossa canina is mostly deep. Alveolar prognathy is moderate or expressed (Table 3).

Females: Brain-case is long according to the mean-values (mediumlong and long crania are the most frequent), mediumwide, mediumhigh. Brain-case on the basis of calculated indices is dolichocranic (hyperdolicho-, dolicho- and mesocranic skulls in almost the ratio), chamaecranic, metriometopic (Tables 4, 5). Skull circumference in norma verticalis is mainly ovoid and pentagonoid. Glabella is weakly developed, generally of degrees 1 and 2. Arcus superciliaris is limited or flat, protuberantia occipitalis externa is weakly developed, of degrees 0 and 1. Processus mastoideus is mainly small (Table 3).

Facial skeleton's characteristics as follows: mediumwide - narrow zygomatic arc with medium bizygomatic breadth. Face is mediumhigh and low, upper face is mediumhigh. Orbita is wide or mediumwide, low. Nose is mediumwide, mediumhigh. According to the indices facial skeleton is mesoprosopic, mesen. Orbita is hyperchamaeconch. Nose is chamaerrhine, but the lepto-, meso-, chamae- and hyperchamaerrhine nose is in the same rate. Palate is brachystaphyline (Tables 4, 5). Orbita is mainly rectangular os subrectangular. Lower edge of nasal aperture is mostly anthropine, but the infantile form is frequent. Spina nasalis anterior is medially developed, generally of degre 3. Fossa canina is very deep or medium deep. Alveolar prognathy is moderate (Table 3).

Characterization of the long bones: Both of sides humeri of the male and female are eurybracher, gracile. The left humeri are rounder and more gracile. Ulnae are eurolen - by the mean-values - in both of sides of males and females. But the platolen ulna is frequent. Both femora of males and the right female femur is without pilaster. Both of sides male femora and the right female one is platymer. The left female femur is hyperplatymer, frequently platymer. The male femora are more robust than the female ones. Graciility of the male femora is the same both of sides, but the right female one is more gracile. Both tibiae of male euryknem, on the left side is frequently mesocnem. The right female tibia is euryknem or mesocnem. The male left tibia is more gracile than the female one. It must be stated that the female right tibia is more robust than both tibiae of male. Parameters of the long bones are in the Table 6.

ANATOMICAL VARIATIONS AND ABNORMALITIES

On the crania: Sutura metopica occurs on 6 cases. On 1 male, 4 female and 1 infans I. age crania. Os apicis can be seen on 6 cases. On 3 male and 1 female crania is onepartitum, on 1 female cranium bipartitum, on 1 juvenile cranium is tripartitum. Morepartitum os incae occurs on 1 female cranium. We find wormiana bones in the most frequence at the sutura lambdoidea. On the right side 5, on the left side 11, on both of sides 24 cases. It must be stated, that because of their bad preservation we cannot see the whole suture. We find wormiana bones at sutura coronalis 2, at sutura sagittalis 4, above the processus mastoideus 3 cases. We find sutura abnormality of the nasal bones on 1 male and 1 female crania. Summing up the above, it can be stated the anatomical variations and abnormalities occured on the 3 infans I., 2 infans II., 6 juvenile individuals' crania and in 56 cases on the grown-up' crania. More frequently on the male (30), than the female (26) crania (Table 7).

Variation of the teeth: The right upper laterale incisivus of the juvenile No. 209 and the left upper third molaris can be seen as pin-tooth. We find overnumber teeth on the 308. grave number male' mandible (between the right caninus and the first premolaris) and on his maxilla (between the right laterale incisivus and caninus; but the right maxilla part is missing).

The variation and abnormalities on the postcranial skeletons are as follows: Perforatio fossae olecrani humeri can be found in 21 cases. More frequently on the female than the male skeletons despite of their worse possibility of studying. Sacrum bifidum occurs in 12 cases. More frequently on the male than the female skeleton. Their possibility of studying is near equal. Sacralisation is observable on 3 male sacri (Table 7). Exostosis is very frequent. It can be seen in our material only on male (in 5 cases on the cranium, in 3 cases on the long bones).

PATHOLOGICAL CHANGES, TREPHINATIONS

Among the changes caused by undeterminable disease is relatively frequent the atrophia in our material. It can mostly be seen on the alveoli of gap-toothed mandible. Osteoprosis changes can be observed on more individuals' vertebrae, as well as on 3 female crania. Cribra orbitalia can be seen on 2 infans II. and 1 female orbita. Both of sides cribra orbitalia is shown on 1 infans I., 1 male and 1 female cranium.

Status post fractum can only be seen on the female skeletons. On the right ulna of No. 75 female, on the left ulna of No. 346 one, on the left radius of No. 143 one, on the left tibia of No. 254 female are fractura completa with dislocatio. Can be seen fractura on the nasal region of the No. 113 female.

From the diseases of articulations the arthritis deformans is also very frequent occuring mainly on the male skeletons, in our material. Beyond the arthritis deformans trails of suppuration can also be observed on os sacrum of No. 21 male. An intense arthritis deformans can be experienced on the left capitulum humeri, on the left circumferentia articularis radii and on the left incisura trochlearis ulnae of No. 89 male. An extensive deformation can be found on the extremitas sternalis claviculae of No. 189, mainly on the right and less on the left side. The same deformation is observed on the right circumferentia articularis radii of No. 345 male and on the left processus condylaris radii of No. 387 male. Spondylitis deformans or spndylosis can be seen on 14 male and 5 female skeletons. Spondylarthritis ankylopoetica (BECHTEREW-disease) was developed as a result of chronic illness on the skeleton of No. 198 male.

Impressiones digitate can be observed on the internal surface of No. 114 male cranium.

Carcinoma metastasis can be seen on the cranium of No. 324 female.

Among the diseases of teeth caries occurs frequently on the juvenile and the grow-ups (both males and females). Trails of cystae can be seen in mandible or maxilla in many cases.

We have found deformations caused by shocking or cutting on 3 male skulls. Especially interesting is the skull No.86, which has a trail of 65 mm length cutting on the right side of it's os frontale. There can be seen an about 35 mm lenght aperture and trails of considerable growth of callus. There is a cavity finger tip on the skull No. 203 above the left orbita of os frontale and on other oval-form can be seen along sutura sagittalis of the skull No. 320.

An oval-form (13x11 mm) symbolical trephination can be seen at bregma in sutura sagittalis of the female skull of 155. graves. There is a supposed symbolical trephination (25x22 mm) on the rigth os parietale of the female skull No. 324, a little right from sutura sagittalis, about 70 mm far from the meeting-point of sutura lambdoidea and sutura sagittalis.

ANALYSIS OF PRIMARY TAXONOMICAL CHARACTERISTICS

We considered the complex analysis of the characteristics the most important but we also analysed the characteristics individually to check the connect of registering of the principial race components (Tables 8, 9).

The value of nasomalar angle is Mongoloid-like on 2 male (93., 164. graves) and 1 female (No. 178) crania. According to the averages both the male and female series are Europoid.

The value of zygomaxillar angle is intermedier between the Europoid and Mongoloid values in 3 male crania (No. 91, 140, 151). All averages of male and female are Europoid.

According to the dacryal subtense the value of 4 male (No. 90, 93, 116, 352) and 3 female (No. 134, 147, 354) is nearer to the Mongoloid values. On the basis of averages both males and females series are intermedier between the Europoid and Mongoloid averages.

The value of simotical subtense is intermedier on 2 male (No. 93, 116) and 1 female (No. 178) cranium. Both the male and female series' averages are Europoid.

According to the dacriyal index 3 male (No. 116, 191, 300) and 1 female (No. 178) are Mongoloid-like. Both mean-values of the male and female series are intermedier.

According to the simotical index 1 female cranium (No. 178) is intermedier. The averages (both males and females) are Europoid.

The value of nasalspine angle is Europoid.

The value of the index of malar arc as a complementary character is similar to the Mongoloid value on 3 male crania (No. 93, 140, 349). The averages (both males and females) are intermedier.

The index of incisure maxillo-malar is a complementary morphological characteristic for the refinement of the analysis. According to the index the mean-values are Europoid.

Analysing all craniological characteristics together, Mongoloid influence can be found on 2 male (No. 93, 116) crania and 1 female (No. 178) cranium. However this influence is not dominant either on them.

ANALYSIS OF SECONDARY TAXONOMICAL CHARACTERS

Results concerning male and female series can be found in Table 10.

Cromagnoid group. The No. 140, 382 male and the No. 354 female skulls belong to the Cromagnoid-A type. The skull of No. 147 female is also Cromagnoid, mixed with other taxa (Cr-x).

Nordoid group. The skull of No. 191 male is Protonordoid. Nordoid type is represented by 3 male (No. 90, 116: n-x, No. 198) and 1 female (No. 155) crania. Mostly Nordoid-like with Brachycran elements is the No. 388 female cranium (n-br).

Mediterranean group. The skulls of No. 151, 300 males and 104, 298 females belong to this group.

Brachycranial group. 3 male skulls (No. 91, 93: p-x, No. 164) belong to the Pamirian type. The Dinaric type is represented by 3 male (No. 343, 349, 352), and 1 female (No. 134) crania. The No. 178 female skull belongs to the undeterminable Brachycranial type.

Summing-up the results of taxonomical analysis, we can state the dolichocranial elements take the major part of our material (together 63.64%). The nordoid group is 27.28%. The frequency of the Cromagnoid and Mediterranean groups is equal (18.18%). The majority of skulls (36.37%) belong to the Brachycranial taxonomical group. The frequency order of types is the same as above in the male group, but all above mentioned taxonomical groups have just as many skulls at the female series. However, it must not neglect the fewer cause number of females.

COMPARATIVE ANALYSIS

We have compared the anthropological material of our cemetery with the male and female series of 22 Arpadian Age, 3 other series from the period of Hungarian Conquest and 4 (A, B, C, D) groups of Hungarians of the 10th century (ÉRY 1978), as well as the Arpadian Age Hungarians' geographic groups (TÓTH 1974, 1980).

According to the results of taxonomical examinations, our cemetery is quite similar with the cemeteries of Kál and Tengelic, with Gáva-Vásártér and with the B-group (Upper-Tisza region). But, contrasted with the last ones, the population of Szabolcs does not contain Europo-mongoloid elements. On the basis of sequence of main race-components, our material is mostly similar to the cemetery of Téglás-Angolkert. But no similarity can be demonstrated with the cemetery of Tiszalök-Rázompuszta, which lies geographically close to it.

According to the topographical data (MARTIN 8, 45, 48, 8:1, 52:51, 54:55) the male series is near to the cemeteries of Zenta-Paphalom, Kardoskút-Fehértó, Téglás-Angolkert, Kál, Jászdózsa-Kápolnahalom, Gáva-Vásártér (Figs. 1-5), the female series is near to the cemetery of Kardoskút-Fehértó, Gáva-Vásártér, Téglás-Angolkert, Kál and B-group (Figs. 6-10).

The material of Szabolcs could only be compared by the primary taxonomical characters with few Arpadian Age cemeteries. We compared our material with the Conquering Hungarians (TÓTH 1965) as well (Table 14). According to the primary characters the greatest topographical similarity to Szabolcs male series is shown by the series of Nagykőrös, to the female series is

shown by the series of Esztergom (Figs. 21-26). The closeness of Conquering Hungarians is notable at both (male and female) series.

According to the ALEXEYEVA's special indices the male series of Szabolcs is near to the cemeteries of Szatymaz-Vasútállomás, Jászdózsa-Kápolnahalom, Pusztapáka-Kiskunfélegyháza, Cegléd, Székesfehérvár-Bikasziget (Table 11, Figs. 11-12), the female series of Szabolcs is near to the cemeteries of Kardoskút-Fehértó, Veszprém-Kálváriadomb, Székesfehérvár-Sóstó, Téglás-Angolkert (Table 12, Figs. 13-14).

According to the PFC and IC the cemetery of Szabolcs is near to the cemeteries of Nagykőrös, Orosháza-Rákócziteleр and Conquering Hungarians (Tables 13, 15, Fig 27). It was possible to compare our material with a few number of Arpadian Age series, because the index of facial flatness is determined only on a few of them.

Summarizing the above mentioned facts, the Arpadian Age population of Szabolcs-Petőfi utca (male and female) is mostly similar to the series of Téglás-Angolkert and Gáva-Vásártér and absolutely dissimilar from the population of Tiszalök-Rázompuszta, lying close by geographical mean. The similarity of the male group to the Northern Hungary geographic male population, as well as the cemetery of Kál; and female group to the cemetery of Kardoskút-Fehértó is remarkable.

The survival of the brachycran elements of the Conquering Hungarians can be followed in our cemetery, and the mixing with the dolichocranial elements of autochton people or of the common strata of Conquering Hungarians, as well.

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Table 2. Distribution of sex and age

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
1.	♂	31-40	♂	ad.
2.	♀	16-20	♀	ad.
3a.	♂	0- 2	-	inf.I.
3b.	♀	31-40	♀	ad.
4a.	♂	31-40	♂	ad.
4b.	♀	31-40	♀	ad.
5.	♀	26-30	♀	ad.
6.	♂	11-15	-	juv.
7.	♀	36-40	♀	ad.-mat.
8.	♀	6-10	-	inf.(II.?)
9.	♀	21-30	♀	ad.
10.	♂	31-40	♂	ad.-mat.
11.	♂	31-40	♂	ad.
12.	♀	16-20	♀	ad.
13.	♂	26-30	♂	ad.
14.	♀	26-35	♀	ad.-mat.
15.	♀	31-40	♀	mat.
16.	♀	0- 5	-	inf.I.
17.	♂	26-31	♂	ad.
18.	♂	21-30	♂	ad.
19.	♂	31-40	♀	ad.
20.	♂	41-50	♂	mat.
21.	♂	31-40	♂	mat.
22.	♀	46-55	♂	mat.
23.	♀	6-10	V	V
24.	♀	21-30	♀	ad.
25.	♂	66-75	♂	sen.
26.	♂	31-40	♂	ad.
27.	♀	21-25	♀	ad.
28.	♂	26-35	♂	mat.
29.	♂	26-30	♂	ad.
30.	♀	31-40	♀	mat.
31.	♂	0- 5	-	inf.I.
32.	♂	30-40	♂	ad.
33.	♂	6-10	-	inf.II.
34.	♀	0- 3	-	inf.I.
35.	♀	26-30	♀	ad.
36.	♀	11-15	-	juv.
37.	♂	0- 3	-	inf.I.
38.	♀	16-20	-	juv.
39.	♂	0- 5	-	inf.(I.-II.?)
40.	♂	0- 3	-	inf.I.
41.	♀	36-45	♀	mat.
42.	♂	31-40	♂	mat.
43.	♂	36-45	V	V
44.	♂	51-60	♂	mat.
45.	♂	31-40	♂	ad.
46.	♀	0- 5	-	inf.I.
47.	♀	21-25	V	V
48.	♂	21-25	♂	ad.-mat.

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
49.	♀	11-15	V	V
50.	♀	46-55	♀	mat.
51.	♂	26-30	♂	ad.-mat.
52.	♂	41-50	♂	mat.
53.	♀	21-25	♀	ad.
54.	♂	0- 5	-	inf.I.
55.	♀	21-25	V	V
56a.	♀	31-40	♀	ad.
56b.	♀	16-20	(♀)	juv.
57.	♂	46-55	V	V
58.	♀	61-70	V	V
59.	♂	0- 5	-	inf.I.
60.	♀	0- 3	-	inf.I.
61.	♀	26-30	V	V
62.	♂	16-21	V	V
63.	♂	36-45	♂	mat.
64.	♀	0- 3	-	inf.I.
65.	♂	0- 5	-	inf.I.
66.	♀	16-20	-	juv.
67.	♀	0- 2	V	V
68.	♀	21-26	-	juv.
69.	♀	31-40	♀	ad.-mat.
70a.	♀	26-30	♀	ad.
70b.	V	V	-	grown-up
70c.	V	V	-	grown-up
70d.	V	V	-	juv.
70e.	V	V	-	inf.II.
71a.	♂	16-20	-	juv.
71b.	♀	6-10	V	V
72.	♀	11-15	-	juv.
73.	♀	26-30	♀	ad.
74.	♂	41-50	♂	mat.
75.	♀	26-30	♀	ad.
76.	♀	31-40	♀	ad.
77.	V	V	♀	ad.
78.	♀	21-30	♀	ad.
79.	♀	0- 3	-	inf.II.
80.	♂	0- 5	-	inf.I.
81.	♀	0- 5	-	inf.I.
82.	♂	26-35	♂	ad.
83a.	♀	0- 5	-	inf.I.
83b.	V	V	-	inf.II.
84.	♀	0- 5	-	inf.I.
85.	♀	31-40	♀	ad.-mat.
86.	♂	25-31	♂	ad.
87.	♀	41-50	♀	ad.
88.	♀	11-15	♀	ad.
89.	♂	46-55	♂	ad.
90.	♂	55-60	♂	mat.
91.	♂	61-70	♂	sen.

Table 2. (Cont. 1)

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
92.	♀	6-10	-	inf.II.
93.	♂	35-40	♂	mat.
94.	♀	31-40	♀	ad.
95.	♂	31-40	♂	ad.
96.	V	V	V	V
97.	♂	31-40	♂	ad.-mat.
98.	♂	41-50	♂	mat.
99.	♀	21-30	♀	ad.
100.	♀	26-31	♀	ad.
101.	♀	0- 5	-	inf.I.
102.	♂	21-36	(♂)	juv.
103.	♀	16-20	(♀?)	juv.
104.	♀	31-40	♀	mat.
105.	♂	51-60	♂	ad.
106.	♀	26-35	♂	ad.
107.	♀	16-20	(♀)	juv.
108.	♀	31-40	♀	ad.-mat.
109.	♂	46-55	♂	mat.
110.	♀	21-35	♀	ad.
111.	♂	6-10	-	inf.II.
112.	♀	21-30	♀	ad.
113.	♀	26-35	♀	ad.
114.	♂	31-40	♂	ad.
115.	♂	31-40	♂?	ad.-mat.
116.	♂	21-25	♂	ad.
117.	♀	0- 5	-	inf.I.
118.	♂	12-16	-	juv.
119.	♀	11-15	-	juv.
120.	♂	36-45	♂	ad.-mat.
121.	♀	21-25	♀	ad.
122.	♀	26-30	♀	ad.
123.	♂	8-10	-	inf.II.
124.	♂	36-45	♂	mat.
125.	♂	31-40	♂	ad.-mat.
126.	♂	6-10	-	-
127.	♂	31-40	♂	mat.
128.	♂	31-40	♂	mat.
129.	♀	36-45	♀	ad.-mat.
130.	♂	31-40	♂	mat.
131.	♀	26-35	♀	ad.
132.	♂	31-40	♂	ad.
133.	♂	41-50	♂	ad.
134.	♀	31-40	♀	ad.
135.	♂	36-45	♂	mat.
136.	♂	31-40	♂	mat.
137.	♀	26-35	♀	ad.
138.	♀	41-50	♀	mat.
139.	♂	31-40	♂	ad.
140.	♂	41-50	♂	mat.
141.	♂	26-35	♂	ad.

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
142.	♀	31-40	♀	ad.
143.	♀	36-45	♀	mat.
144.	♀	26-30	♀	ad.
145.	♀	36-45	♀	mat.
146.	♂	36-45	♂	mat.
147.	♀	36-45	♀	mat.
148.	♂	26-30	♂	ad.
149.	♂	31-40	♂	mat.
150.	♂	31-40	♂	ad.
151.	♂	26-35	♂	ad.
152.	♂	31-40	♂	ad.-mat.
153.	♂	0- 5	-	inf.I.
154.	♂	31-40	♂	ad.
155.	♀	31-40	♀	ad.
156.	♀	16-20	(♀)	juv.
157.	♀	41-50	♀	ad.
158.	♂	31-40	♂	ad.
159.	♀	0- 5	-	inf.II.
160.	♂	26-35	♂	ad.
161.	♂	16-20	♂	ad.
162.	♀	0- 5	-	inf.I.
163.	♂	41-50	♂	mat.
164.	♂	36-45	♂	ad.
165.	♀	51-60	♀	mat.?
166.	♀	26-30	♀	ad.
167.	♂	0- 5	-	inf.I.
168.	♀	21-30	♀	ad.
169.	♂	0- 5	-	inf.I.
170.	♀	11-15	-	inf.II.
171.	♀	11-15	-	juv.
172.	♀	16-20	-	juv.
173.	♀	31-40	♀	ad.
174.	♀	31-40	♀	ad.
175.	♂	11-15	(♂)	juv.
176.	♀	31-40	♀	ad.
177.	♂	16-20	(♂)	juv.
178.	♀	41-50	♀	mat.
179.	♂	11-15	-	juv.
180.	♂	46-55	♂	mat.
181.	♀	11-15	-	juv.
182.	♂	36-45	♂	mat.
183.	♂	36-45	♂	mat.
184.	♂	31-40	♂	ad.-mat.
185.	♂	35-40	V	V
186.	♂	31-40	♂	ad.-mat.
187.	♂	0- 5	-	inf.I.
188.	♀	6-10	-	inf.I.
189.	♀	41-50	♀	mat.
190.	♀	16-20	-	juv.
191.	♂	31-40	♂	ad.

Table 2. (Cont. 2)

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
192.	♂	26-35	♂	ad.
193a.	♂	41-50	-	-
193b.	♂	0- 5	-	inf.I.
194.	♀	6-10	-	inf.II.
195.	♀	31-40	♀	ad.
196.	♀	31-40	♀	ad.
197.	♂	21-25	♂	mat.?
198.	♂	31-40	♂	mat.
199.	♂	26-35	♂	ad.
200.	♀	21-25	♀	ad.
201.	♀	0- 2	-	inf.I.
202.	♂	41-50	♂	mat.
203.	♂	31-40	♂	mat.
204.	♀	6-10	-	inf.I.
205.	♂	36-45	♂	mat.
206.	♀	21-26	♀	ad.
207.	♂	11-15	-	juv.
208.	♀	31-40	♀	ad.
209.	♂	14-20	(♂)	juv.
210.	♂	26-35	V	V
211.	♀	16-20	(♀)	juv.
212.	♀	11-15	(♀)	juv.
213.	♀	26-30	♀	ad.
214.	♀	36-45	♀	ad.-mat.
215.	♀	16-20	(♀)	juv.
216.	♀	26-30	-	-
217.	♂	0- 5	-	inf.I.
218.	♂	0- 5	-	inf.I.
219.	♀	41-50	♀	mat.
220.	♂	31-40	♂	ad.
221.	♂	0- 2	-	inf.I.
222.	♀	0- 2	-	inf.I.
223.	V	V	♀	mat.
224.	♂	8-10	-	inf.II.
225.	♀	36-45	♀	mat.
226.	♀	16-20	(♀)	juv.
227.	♂	0- 1	-	inf.I.
228.	♀	11-15	-	juv.
229.	♂	36-45	♂	ad.
230.	♀	0- 5	-	inf.I.
231.	♂	31-40	♂	ad.
232.	♀	26-30	♀	ad.
233.	♀	41-50	♀(?)	-
234.	♂	31-40	♀	ad.
235.	♂	26-30	♂	ad.
236.	♂	51-60	♂	mat.
237.	♀	16-20	♀	ad.
238.	♀	6-10	-	inf.II.
239.	♀	36-45	♀	mat.
240.	♂	6-10	-	inf.I.

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
241.	♀	0- 5	-	inf.I.
242.	♀	41-50	♀	mat.
243.	♂	26-30	♂	mat.
244.	♀	31-40	♀	ad.
245.	♀	31-40	♀	ad.
246.	♂	26-35	♂	ad.
247.	♀	41-50	♀	ad.-mat.
248.	♀	21-26	♀	ad.
249.	♀	0- 3	-	inf.I.
250.	♀	26-35	♀	ad.
251.	♂	0- 5	-	inf.I.
252.	♂	31-40	♂	ad.
253.	♀	26-30	♀	ad.
254.	♀	31-40	♀	mat.
255.	♀	21-25	♀	ad.
256.	♀	16-20	(♀)	juv.
257.	♀	11-15	-	inf.II.
258.	♂?	0- 5	-	inf.I.
259.	♀	41-50	♀	mat.
260.	♀	26-30	♀	ad.
261.	♀	31-35	♀	ad.
262.	♀	26-35	♀	ad.
263.	♂	46-55	♂	mat.
264.	♀	36-45	♀	mat.
265.	♂	26-30	♂	ad.
266.	♀	31-40	♀	ad.-mat.
267.	♂	26-30	♂	ad.
268.	♂	31-35	♂	ad.
269.	♀	6-10	-	inf.II.
270.	♂	0- 5	-	inf.I.
271.	♀	41-50	♀(?)	-
272.	♀	26-30	♀	ad.
273.	♀	41-50	♀	mat.
274.	♂	36-45	♂	ad.
275.	♀	0- 5	-	inf.I.
276.	♀	31-40	♀	ad.
277.	♂	26-30	♂	ad.
278.	♂	46-55	♂	mat.
279.	♂	11-16	-	juv.
280.	♂	26-35	♂	ad.
281.	♀	21-25	-	juv.
282.	♀	0- 3	-	inf.I.
283.	♀	0- 5	-	inf.I.
284.	♂	0- 5	-	inf.I.
285.	♂	36-45	♂	mat.
286.	♂	0- 5	-	inf.I.
287.	♂	31-40	♀	ad.
288.	♀	0- 5	-	inf.I.
289.	♀	6-10	-	inf.(II.?)
290.	♀	41-50	♀	mat.

Table 2. (Cont. 3)

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
291.	♀	0- 3	-	inf.I.
292.	♀	0- 5	V	V
293.	♀	11-15	-	inf.II.
294.	♂	31-40	♂	mat.
295.	♂	41-50	♂	mat.
296.	♀	6-10	-	inf.II.
297.	♀	31-35	♀	ad.
298.	♀	31-40	♀	mat.
299.	♀	21-26	♀	ad.
300.	♂	31-40	♂	mat.
301.	♀	0- 3	V	V
302.	♀	0- 5	-	inf.I.
303.	♂	11-15	(♂)	juv.
304.	♂	36-45	♂	ad.
305.	♀	16-20	(♀)	juv.
306.	♀	0- 3	-	inf.I.
307.	♀	31-35	♀	ad.
308.	♂	21-26	♂	ad.
309.	♂	41-50	♂	mat.
310.	♀	0- 5	-	inf.I.
311.	♂	31-40	♂	ad.
312.	♀	11-15	(♀)	juv.
313.	♂	41-50	♂	ad.
314.	♀	6-10	-	inf.II.
315.	♂	26-35	♂	mat.
316.	♂	0- 5	-	inf.I.
317.	♂	0- 5	-	inf.I.
318.	♀	0- 5	-	inf.I.
319.	♂	11-15	V	V
320.	♀	31-40	♂	ad.
321.	♂	36-45	♂	mat.
322.	♀	11-15	-	inf.II.
323.	♀	21-26	♀	ad.
324.	♀	31-40	♀	ad.
325.	♂	0- 5	-	-
326.	♀	0- 1	-	inf.I.
327.	♀	31-40	♀	ad.
328.	♀	26-30	♀	ad.
329.	♂	0- 5	V	V
330.	♀	21-25	♂	ad.
331.	♀	26-30	♀	ad.
332.	♀	0- 5	-	inf.I.
333.	♀	6-10	-	inf.I.
334.	♀	26-30	♀	ad.
335.	♀	16-20	(♀)	juv.
336.	♂	0- 5	-	inf.I.
337.	♂	31-40	♂	mat.
338.	♀	0- 5	-	inf.I.
339.	♂	41-50	♂(?)	ad.

Grave No.	Biochemical		Morphological	
	Sex	Age	Sex	Age
340.	♂	41-50	♂	mat.
341.	♂	6-10	-	inf.(I.?)
342.	♂	26-30	♂	ad.
343.	♂	36-45	♂	mat.
344.	♀	21-26	♀	ad.
345.	♂	36-45	♂	mat.
346.	♀	26-30	♀	mat.
347.	♀	0- 5	-	inf.I.
348.	♂	41-50	♂	mat.
349.	♂	26-30	♂	ad.
350.	♂	0- 5	-	inf.I.
351.	♀	31-40	-	-
352.	♂	41-50	♂	mat.
353.	♂	0- 5	-	inf.I.
354.	♀	21-35	♀	ad.
355.	♀	11-16	-	inf.II.
356.	♀	16-20	-	juv.
357.	♀	36-45	♀	ad.
358.	♀	36-45	♀	ad.
359.	♂	21-30	♂	ad.
360.	♂	21-25	♂	ad.
361.	♀	26-35	-	-
362.	♀	25-30	♀	ad.
363.	♀	26-35	♀(?)	ad.?
365.	♀	46-55	♀	mat.
366.	♀	6-10	-	inf.II.
367.	♀	31-40	♀	ad.
368.	♂	6-10	-	inf.II.
369.	♀	21-26	♀	ad.
370.	♂	31-40	♂	ad.-mat.
372.	♂	31-40	V	V
373.	♀	0- 5	-	inf.I.
374.	♀	11-15	-	inf.II.
375.	♀	26-35	♀	ad.
376.	♀	16-20	V	V
377.	♂	41-50	♂	mat.
378.	♀	26-35	♀	ad.
380.	♀	21-30	♀	ad.
381.	♂	31-40	♂	mat.
382.	♂	41-50	♂	mat.
383.	♀	31-40	♂	ad.
384.	♀	51-60	♀	sen.
385.	♂	31-40	♂	ad.
386.	♂	26-30	♂	ad.
387.	♂	21-30	♂	ad.
388.	♀	31-40	♀	ad.
389.	♀	11-15	-	juv.
Scatt.I.	V	V	♀	ad.
Scatt.II.	V	V	♀	mat.

Table 3. Distribution of morphological characters

Characteristics		♂	♀	Total
Norma verticalis	ovoid	9	7	16
	pentagonoid	11	6	17
	ellipsoid	-	-	-
	sphenoid	-	-	-
	spheroid	1	-	1
	romboid	7	4	11
Glabella	Broca 1	3	26	29
	Broca 2	13	7	20
	Broca 3	20	6	26
	Broca 4	12	-	12
	Broca 5	1	-	1
	Broca 6	-	-	-
Arcus superciliaris	flat	2	17	19
	discernible	15	28	43
	strong	38	4	42
Protuberantia occ. ext.	Broca 0	2	13	15
	Broca 1	14	14	28
	Broca 2	17	5	22
	Broca 3	15	-	15
	Broca 4	2	-	2
	Broca 5	-	-	-
Processus mastoideus	small	15	46	61
	medium	25	14	39
	strong	21	1	22
Orbita	rounded	1	3	4
	subrectangular	9	8	17
	rectangular	13	6	19
Nasal aperture	infantile	6	8	14
	sulcus praenas.	4	1	5
	fossa praenas.	2	1	3
	anthropine	25	33	58
Spina nasalis anterior	Broca 1	-	-	-
	Broca 2	2	1	3
	Broca 3	3	7	10
	Broca 4	7	-	7
	Broca 5	-	-	-
Fossa canina	very small	3	1	4
	small	3	-	3
	medium	-	2	2
	large	7	-	7
	very large	3	3	6
Alveolar prognathy	vertical	7	4	11
	moderate	9	6	15
	expressed	9	6	15

Table 4. Parameters of the male and female series - Cranium

MARTIN No.	Males			
	N	V	M	s
1	23	168-198	183.13	6.29
1c	24	172-195	182.71	5.59
5	16	90-109	101.69	5.28
8	22	130-150	139.23	5.36
9	24	91-105	96.21	3.48
10	20	111-131	119.25	4.76
17	18	120-146	133.00	6.22
20	17	108-119	113.71	2.81
32	13	73- 88	83.08	4.75
32-	13	67- 81	75.38	4.56
40	11	87-104	96.55	5.67
43	16	93-112	104.31	4.39
45	9	124-140	134.11	5.30
46	16	84-101	94.68	4.21
47	12	109-122	117.17	4.26
48	16	63- 76	69.94	4.01
51	17	42- 48	44.06	1.60
52	17	30- 38	32.59	1.74
54	19	19- 31	24.63	2.63
55	17	46- 54	50.71	2.45
62	18	40- 51	45.72	3.41
63	14	38- 46	41.50	2.41
65	7	110-134	121.57	8.90
66	13	91-119	105.15	8.37
68	12	70- 85	77.92	4.97
68/1	12	52- 69	60.42	4.54
69	20	23- 37	30.30	3.44
70	16	63- 80	70.13	5.20
71a	22	29- 37	33.09	2.62
72	13	79- 90	84.23	3.69
73	13	81- 95	86.08	4.31
74	13	63- 85	75.54	6.71
75	5	44- 61	56.00	7.04
75/1/	5	14- 38	24.60	8.60
79	12	105-139	122.58	8.81
8: 1	21	68.95- 87.06	76.26	5.02
17: 1	16	67.57- 78.07	73.19	3.32
17: 8	16	87.58-104.29	95.63	5.55
9: 8	22	62.16- 76.12	69.00	3.66
47:45	8	78.42- 96.77	88.13	5.93
48:45	8	46.76- 56.45	52.19	3.04
52:51	17	68.18- 86.36	74.00	4.30
54:55	17	37.03- 59.62	49.12	4.70
63:62	12	80.39-105.00	92.21	6.52

MARTIN No.	Females			
	N	V	M	s
1	9	170-185	177.22	5.38
1c	9	172-185	177.78	4.93
5	6	92-100	97.50	2.82
8	11	127-142	134.91	4.71
9	14	85-100	92.21	4.04
10	8	111-123	116.13	4.29
17	7	116-134	127.29	5.47
20	7	108-122	112.13	4.88
32	5	81- 97	85.00	6.82
32a	5	75- 91	79.80	6.92
40	6	87-101	92.67	5.40
43	12	93-106	100.58	3.37
45	2	125-127	126.00	-
46	11	86- 99	92.00	3.79
47	4	105-113	109.00	-
48	12	58- 71	65.33	4.72
51	12	40- 45	42.00	1.24
52	12	30- 35	32.00	1.35
54	10	22- 30	25.20	2.30
55	10	42- 51	48.30	2.75
62	8	41- 47	44.00	2.14
63	5	40- 41	40.40	0.58
65	2	119-120	119.50	-
66	5	92- 99	96.00	2.55
68	9	68- 82	74.11	5.18
68/1	9	51- 61	56.36	3.18
69	11	19- 29	25.18	3.25
70	12	57- 70	63.75	3.50
71a	12	21- 35	29.50	3.58
72	5	79- 92	86.25	4.60
73	4	87- 92	89.25	-
74	4	74- 86	79.00	-
75	2	57- 66	61.50	-
75/1/	2	26- 32	30.00	-
79	9	113-134	129.44	7.27
8: 1	9	71.75- 79.41	75.56	2.40
17: 1	5	69.73- 74.42	71.10	2.00
17: 8	6	91.49- 95.56	94.33	1.30
9: 8	11	66.20- 76.38	69.05	3.30
47:45	2	82.68- 90.40	86.54	-
48:45	2	51.97- 56.80	54.39	-
52:51	12	73.17- 83.33	76.25	3.17
54:55	10	44.90- 62.50	52.25	5.37
63:62	5	85.11- 97.56	91.60	5.02

Table 5. Distribution of measurements and indices according to ALEXEYEV & DEBETS

MARTIN No.	Classification	N ♂	N ♀
	very short	3	-
	short	1	-
1.	medium	10	4
	long	6	2
	very long	3	3
	very short	2	-
	short	3	1
5.	medium	5	3
	long	3	2
	very long	3	-
	very narrow	3	2
	narrow	6	-
8.	medium	9	7
	wide	3	2
	very wide	1	-
	very narrow	-	2
	narrow	5	1
9.	medium	14	9
	wide	4	1
	very wide	1	1
	very narrow	-	-
	narrow	5	-
10.	medium	8	5
	wide	5	1
	very wide	2	2
	very low	2	1
	low	6	-
17.	medium	5	5
	high	4	1
	very high	1	-
	very short	3	1
	short	3	3
40.	medium	2	1
	long	3	1
	very long	-	-
	very narrow	1	1
	narrow	3	1
43.	medium	8	7
	wide	3	3
	very wide	1	-

MARTIN No.	Classification	N ♂	N ♀
	very narrow	1	-
	narrow	1	-
45.	medium	4	2
	wide	3	-
	very wide	-	-
	very narrow	1	-
	narrow	6	4
46.	medium	7	4
	wide	2	3
	very wide	-	-
	very low	-	-
	low	3	2
47.	medium	9	2
	high	-	-
	very high	-	-
	very low	2	2
	low	5	2
48.	medium	5	4
	high	4	4
	very high	-	-
	very narrow	-	-
	narrow	-	-
51.	medium	3	4
	wide	7	6
	very wide	6	2
		1	-
	very low	3	5
	low	11	3
52.	medium	2	4
	high	-	-
	very high	1	-
		1	-
	very narrow	1	-
	narrow	9	1
54.	medium	6	5
	wide	1	3
	very wide	1	1
	very low	1	1
	low	7	2
55.	medium	6	5
	high	3	2
	very high	-	-

Table 5. (Cont.1)

MARTIN No.	Classification	N ♂	N ♀
	very narrow	1	-
	narrow	1	-
65.	medium	2	-
	wide	1	2
	very wide	2	-
	very narrow	-	-
	narrow	2	-
66.	medium	3	4
	wide	4	1
	very wide	4	-
		1	1
	very low	5	3
	low	7	5
69.	medium	2	-
	high	2	-
	very high	-	-
	very small	-	-
	small	2	1
72.	medium	4	-
	large	3	2
	very large	4	1
		-	1
	very small	-	-
	small	4	-
73.	medium	3	-
	large	4	2
	very large	1	2
		1	-
	very small	2	-
	small	1	-
74.	medium	5	1
	large	3	2
	very large	2	1
	very long	6	3
	long	6	3
8:1	medium	5	3
	short	1	-
	very short	3	-
	very low	1	-
	low	6	4
17:1	medium	4	1
	high	5	-
	very high	-	-

MARTIN No.	Classification	N ♂	N ♀
	very low	1	-
	low	4	-
17:8	medium	3	6
	high	7	-
	very high	1	-
	very narrow	1	-
	narrow	2	2
9:8	medium	11	7
	wide	3	-
	very wide	5	2
	very wide	1	-
	wide	2	1
47:45	medium	4	1
	narrow	1	-
	very narrow	-	-
	very wide	1	-
	wide	2	-
48:45	medium	4	1
	narrow	1	1
	very narrow	-	-
	very low	10	8
	low	5	3
52:51	medium	1	1
	high	1	-
	very high	-	-
	very narrow	1	-
	narrow	4	3
54:55	medium	8	2
	wide	3	2
	very wide	1	3
	very narrow	-	-
	narrow	1	-
63:62	medium	3	2
	wide	6	2
	very wide	2	1

Table 6. Parameters of the male and female series - Post-cranium

MARTIN No.		Males				Females			
		N	V	M	s	N	V	M	s
Humerus	1 R	12	309-350	326.83	12.67	8	277.327	303.63	15.63
	L	9	314-365	334.89	14.83	11	272-325	299.55	14.00
	5 R	40	20- 26	23.03	1.39	29	17- 23	19.79	1.86
	L	37	18- 26	22.84	1.70	27	16- 23	19.56	1.76
	6 R	40	13- 22	18.37	1.74	29	14- 19	15.76	1.36
	L	37	14- 21	17.97	1.63	27	13- 18	15.37	1.36
	7 R	41	52- 72	63.49	3.22	28	47- 60	55.14	2.83
	L	38	50- 71	62.18	3.68	27	45- 59	53.30	3.18
	6:5 R	40	61.90- 91.30	79.78	5.61	28	71.43- 90.48	78.43	5.22
	L	36	70.00- 95.00	80.78	5.48	26	69.57- 90.00	78.84	4.96
	7:1 R	12	17.43- 21.43	19.33	1.31	8	17.13- 19.16	18.14	0.64
	L	9	16.71- 20.70	19.00	1.17	11	16.54- 17.25	17.91	0.88
Radius	1 R	4	235-257	249.25	-	6	206-249	222.00	16.07
	L	4	253-257	255.25	-	7	204-238	219.86	12.22
	2 R	20	212-258	24.30	11.61	16	194-235	210.50	11.44
	L	18	209-270	232.56	16.63	17	187-239	208.18	13.31
	3 R	29	34- 49	42.44	3.19	19	32- 41	36.58	2.59
	L	28	35- 59	42.11	4.55	22	30- 42	35.77	2.78
	4 R	30	14- 19	16.60	1.28	21	12- 16	14.33	1.65
	L	34	12- 19	16.24	1.69	23	12- 16	14.09	1.31
	5 R	30	11- 14	12.17	0.95	21	8- 14	10.43	1.37
	L	34	10- 18	12.26	1.40	23	8- 12	10.13	0.87
	5:4 R	30	63.16- 85.71	73.53	5.53	20	60.00- 80.00	72.35	5.47
	L	34	63.16-112.50	75.62	9.37	23	64.19- 84.62	72.09	4.93
	3:2 R	20	16.88- 20.59	18.40	1.23	16	15.17- 19.42	17.19	1.22
	L	16	14.81- 20.09	17.75	1.36	17	14.93- 19.79	17.06	1.43
Ulna	2 R	18	214-260	238.28	12.28	10	206-223	217.30	5.19
	L	17	208-275	237.94	17.83	6	202-226	214.00	9.49
	3 R	20	33- 43	38.15	4.08	15	28- 38	33.00	2.85
	L	24	31- 43	36.67	3.60	12	27- 37	32.08	3.15
	11 R	25	11- 16	13.64	1.50	15	11- 16	12.27	2.05
	L	29	11- 16	13.03	1.30	14	9- 13	11.57	1.21
	12 R	25	15- 19	16.72	1.15	16	13- 16	14.56	1.16
	L	29	13- 19	16.10	1.76	14	12- 17	14.14	1.61
	13 R	24	16- 23	20.42	1.82	15	14- 21	18.20	1.78
	L	27	17- 24	20.74	1.68	12	14- 20	17.75	2.02
	14 R	24	21- 29	25.17	2.33	15	14- 26	21.93	2.97
	L	27	22- 30	25.59	2.17	12	18- 26	22.17	2.33
	3:2 R	17	14.12- 18.35	16.24	2.49	10	13.90- 17.35	15.00	1.05
	L	16	13.06- 18.14	15.31	1.66	9	13.24- 15.93	14.78	1.01
	11:12 R	25	66.67- 88.89	81.56	6.06	16	68.75- 93.75	83.63	7.29
	L	28	68.42- 92.86	80.25	7.66	13	68.75- 91.67	82.62	6.21
	13:14 R	24	73.08- 91.30	80.96	5.76	15	69.23- 90.47	81.40	6.79
	L	27	73.08- 92.00	82.56	6.98	12	62.52- 90.91	81.25	6.94

Table 6. (Cont. 1)

MARTIN No.		Males				Females			
		N	V	M	s	N	V	M	s
Femur	1 R	20	411-512	459.60	23.48	23	389-455	414.65	17.37
	L	20	413-514	456.35	22.44	23	389-452	418.22	17.15
	2 R	20	408-511	459.20	22.83	22	385-452	409.05	17.26
	L	20	408-411	450.75	20.76	23	383-448	414.26	20.53
	6 R	47	24- 33	28.02	2.29	43	21- 31	24.81	2.05
	L	46	24- 33	28.43	2.15	40	20- 30	24.85	2.09
	7 R	46	23- 31	27.76	1.88	43	21- 30	24.86	1.89
	L	46	24- 32	28.09	1.74	40	22- 30	25.98	1.90
	8 R	45	77-102	87.69	5.34	42	67- 93	77.95	4.96
	L	45	78- 97	87.78	4.94	40	68- 93	78.50	5.08
	9 R	45	28- 37	33.07	2.52	40	26- 40	30.98	2.63
	L	41	30- 38	33.80	2.08	41	27- 40	31.76	2.66
	10 R	45	23- 36	27.36	2.56	40	19- 28	23.28	2.16
	L	40	24- 36	27.18	2.42	40	19- 28	23.65	2.18
	8:2 R	20	16.24- 21.84	19.65	1.28	22	16.37- 19.85	18.65	0.97
	L	19	16.47- 22.20	19.63	1.17	22	16.29- 20.90	18.86	1.10
	6:7 R	45	85.71-122.22	101.36	8.50	43	85.71-121.74	100.07	8.99
	L	45	83.33-119.23	101.62	8.72	40	85.19-112.50	97.98	7.27
	10:9 R	43	66.67-105.88	83.21	8.71	40	62.50- 87.88	75.20	6.44
	L	40	66.67-109.09	81.18	4.02	41	66.67- 83.87	74.02	4.58
Tibia	1 R	15	340-398	369.20	17.97	16	259-367	310.20	38.62
	L	17	317-424	370.59	16.29	12	299-357	325.33	23.93
	8a R	48	28- 38	33.65	2.60	40	24- 35	29.53	2.30
	L	45	27- 40	33.16	2.62	36	23- 35	29.36	2.42
	9a R	48	19- 28	23.90	2.38	42	14- 26	20.74	2.02
	L	46	19- 28	23.17	2.25	36	16- 29	20.36	1.84
	10b R	45	64- 83	72.49	4.29	40	56- 78	65.53	4.16
	L	45	63- 83	72.24	4.25	33	57- 75	65.09	3.84
	9a:8a R	48	56.76- 83.87	72.50	6.36	40	48.28- 83.87	70.10	6.18
	L	45	56.76- 84.85	70.24	7.19	36	53.85- 82.14	68.83	6.28
	10b:1 R	15	17.18- 21.18	19.67	1.43	16	18.86- 24.71	19.88	1.58
	L	17	15.33- 22.48	19.59	1.78	12	18.60- 21.01	19.58	0.81

Table 7. Anatomical variations and abnormalities

Variations, abnormalities	Inf.I.	Inf.II.	Juv.	♂	♀	Total
Sutura metopica	1	-	-	1	4	6
Os apicis	-	-	-	3	1	4
Os apicis bipartitum	-	-	-	-	1	1
Os apicis tripartitum	-	-	1	-	-	1
Os bregmaticum	-	-	-	1	-	1
Os incae	-	-	-	-	1	1
Wormian bones						
at sutura lambdoidea						
right side	2	-	-	1	2	5
left side	-	-	1	5	5	11
both of sides	-	2	3	12	7	24
at sutura coronalis						
right side	-	-	-	1	1	2
left side	-	-	-	1	1	2
at sutura sagittalis	-	-	1	2	1	4
above proc. mastoideus	-	-	-	2	1	3
Sutura variation at os nasale	-	-	-	1	1	2
Perforatio fossae olecrani humeri						
right side	-	-	-	1	1	2
left side	-	2	2	3	3	8
both of sides	-	-	-	2	9	11
Sacrum bifidum						
cranial	-	-	-	1	-	1
caudal	-	-	1	6	4	11
Sacralisation	-	-	-	3	-	3

Table 8. Parameters of the facial flatness - Males

Characteristics		N	V	M	s
MC	Maxillofrontal chord	15	7- 23	17.67	3.71
MS	Maxillofrontal subtense	15	5- 8	6.93	0.99
BC	Bi-malar chord	14	95-106	99.93	3.11
BS	Bi-malar subtense	14	14- 23	18.21	2.36
NA	Nasomalar angle	14	110-148	137.93	8.94
ZC	Zygomaxillar chord	14	86-106	95.71	5.26
ZS	Zygomaxillar subtense	13	19- 28	23.15	2.70
ZA	Zygomaxillar angle	13	118-137	127.92	5.75
DC	Dacryal chord	14	18- 28	21.71	2.56
DS	Dacryal subtense	14	8- 13	10.43	1.61
ID	Dacryal index	14	36.36-61.90	47.61	7.32
SC	Simotical chord	15	4- 11	8.73	2.13
SS	Simotical subtense	15	3- 7	5.27	1.17
IS	Simotical index	15	45.45-82.67	61.07	10.50
C	Malar chord	11	47- 59	55.45	3.48
S	Malar subtense	11	10- 14	12.00	1.18
S:C	Malar arc index	11	17.92-25.59	21.27	1.96
IMMC	Incisure maxillo-malar chord	9	20- 32	25.44	4.10
IMMS	Incisure maxillo-malar subtense	9	5- 8	6.44	0.90
IMM	index	9	18.52-34.50	25.78	4.93
FC	Fossa canina	16	1- 7	4.38	1.86

Table 9. Parameters of the facial flatness - Females

Characteristics		N	V	M	s
MC	Maxillofrontal chord	8	10- 22	17.00	3.51
MS	Maxillofrontal subtense	8	5- 8	6.25	1.04
BC	Bi-malar chord	8	92-101	95.75	3.21
BS	Bi-malar subtense	8	13- 22	17.50	2.57
NA	Nasomalar angle	8	132-150	140.38	4.90
ZC	Zygomaxillar chord	7	88- 99	93.00	3.00
ZS	Zygomaxillar subtense	7	23- 26	24.57	1.29
ZA	Zygomaxillar angle	7	121-128	125.14	2.55
DC	Dacryal chord	8	10- 25	19.38	4.50
DS	Dacryal subtense	8	6- 12	9.13	2.00
ID	Dacryal index	8	24.80-58.82	44.81	11.63
SC	Simotical chord	7	7- 11	8.86	1.26
SS	Simotical subtense	7	3- 6	4.42	1.35
IS	Simotical index	7	38.46-66.67	54.43	10.71
C	Malar chord	3	48- 50	47.87	-
S	Malar subtense	3	8- 10	9.63	-
S:C	Malar arc index	3	18.26-21.43	20.09	-
IMMC	Incisure maxillo-malar chord	4	23- 27	25.00	-
IMMS	Incisure maxillo-malar subtense	4	6- 8	6.63	-
IMM	index	4	23.34-31.50	25.47	-
FC	Fossa canina	7	2- 7	4.71	1.73

Table 10. Taxonomical analysis

Types		Males		Females		Total	
		N	%	N	%	N	%
Cromagnoids	Cromagnoid A	2	9.09	1	4.55	3	13.64
	Cromagnoid-x	-	-	1	4.55	1	4.55
Nordoids	Protonordoid	1	4.55	-	-	1	4.55
	Nordoid	3	13.64	2	9.10	5	22.73
Mediterraneans	Atlanto-Mediterranean	2	9.10	2	9.10	4	18.18
Brachycraniais	Pamirian	3	13.64	-	-	3	13.64
	Dinaric	3	13.64	1	4.55	4	18.18
	Brachycranial	-	-	1	4.55	1	4.55
Total		14		8		22	

Table 11. Comparison of ALEXEYEVA's special indices - Males

No.	Characteristics / Series	N	17x100 / (1+8):2	48x100 / 17	52x100 / 17	54x100 / 45
1.	Pusztapáka (Kiskunfélegyháza), 11th c. (ALLODIATORIS 1937)	21	82.72	52.56	25.06	18.49
2.	+Fiad-Kérpuszta, 11th c. (NEMESKÉRI et al. 1953, TÓTH 1973)	84	83.50	50.90	23.90	18.80
3.	Veszprém-Kálváriadomb, 10-11th c. (ACSÁDI & NEMESKÉRI 1957)	19	85.38	51.00	23.94	19.06
4.	Cegléd, 11-12th c. (LIPTÁK 1957)	18	83.42	53.32	24.56	18.49
5.	Jászdózsa-Kápolnahalom, 11-14th c. (LIPTÁK 1957)	22	82.40	53.51	24.28	18.17
6.	+Zenta-Paphalom, 14-15th c. (BARTUCZ & FARKAS 1958, TÓTH 1973)	48	83.10	52.60	24.30	18.50
7.	†Székesfehérvár-Bikasziget, 10-11th c. (ACSÁDI & NEMESKÉRI 1959, TÓTH 1973)	16	82.74	54.05	24.65	18.50
8.	Gáva-Vásártér 11th c. (NEMESKÉRI et al. 1961)	8	83.89	54.21	25.32	18.89
9.	Orosháza-Rákóczitelep, 10-12th c. (LIPTÁK & FARKAS 1962)	87	82.78	53.92	24.98	18.58
10.	Fonyód, 13-16th c. (DEZSŐ et al. 1963)	37	84.42	51.65	24.61	18.65
11.	+Téglás-Angolkert, 11-14th c. (LIPTÁK & MARCSIK 1965, TÓTH 1973)	11	79.20	52.30	24.10	19.10
12.	+Békés-Povádzug, 10-12 th c. (LIPTÁK & FARKAS 1967a, TÓTH 1973)	27	84.30	53.30	24.60	19.50
13.	+Szatymaz-Vasútállomás, 10-12th c. (LIPTÁK & FARKAS 1967b, TÓTH 1973)	80	82.50	53.40	24.70	19.20
14.	Aldebrő-Mocsáros, 10-11th c. (MARCSIK 1967)	5	84.08	51.67	23.03	19.13
15.	Sárbogárd, 10th c. (ÉRY 1968)	19	81.91	50.30	23.22	19.01
16.	+Kardoskút-Fehértó, 11-12th c. (MARCSIK 1970, TÓTH 1973)	104	81.70	53.20	25.50	18.30
17.	Kál, 10th c. (ÉRY 1970)	17	82.43	50.63	24.28	18.47
18.	+Helemba-Sziget, 13-17th c. (WENGER 1971, TÓTH 1973)	18	80.90	52.70	26.10	18.20
19.	Tengelic, 10th c. (ÉRY 1971)	9	81.00	50.38	24.36	18.68
20.	Oroszvár, 10-11th c. (BOTTYÁN 1972)	18	82.53	49.96	24.60	18.68
21.	Nagytálya, 13-16th c. (KOROMPAI 1974)	14	85.43	50.54	24.30	17.81
22.	Tiszalök-Rázompuszta, 11th c. (LOTTERHOF 1974)	27	84.24	49.99	24.02	17.64

Table 11. (Cont. 1)

No.	Characteristics / Series	N	17x100 / (1+8):2	48x100 / 17	52x100 / 17	54x100 / 45
23.	A group, 10th c. (ÉRY 1978)	30	82.81	53.88	24.96	18.80
24.	B group, 10th c. (ÉRY 1978)	25	82.59	51.47	24.19	18.51
25.	C group, 10th c. (ÉRY 1978)	75	83.35	49.93	23.66	18.86
26.	D group, 10th c. (ÉRY, 1978)	15	81.80	53.09	24.70	18.72
27.	Esztergom-Vasútállomás, 11-12th c. (PAP 1979a)	11	80.70	52.47	25.60	19.88
28.	Nagykőrös, 11-13th c. (PAP 1979b)	23	81.49	54.35	25.01	19.33
29.	Taliándörögd, 12-13th c. (ÉRY 1979)	15	82.69	49.49	23.17	18.93
30.	Szabolcs-Petőfi utca, 10-12th c.	23	82.52	52.59	24.50	18.37

+ T. TÓTH's data (1973)

Table 12. Comparison of ALEXEYEVA's special indices - Females

No.	Characteristics / Series	N	17x100 / (1+8):2	48x100 / 17	52x100 / 17	54x100 / 45
1.	Pusztapáka (Kiskunfélegyháza), 11th c. (ALLODIATORIS 1937)	18	83.26	51.62	25.19	18.62
2.	Fiad-Kérpuszta, 11th c. (NEMESKÉRI 1953)	75	83.39	49.08	24.59	18.63
3.	Veszprém-Kálváriadomb, 10-11th c. (ACSÁDI & NEMESKÉRI 1957)	10	81.07	51.31	25.89	19.49
4.	Cegléd, 11-12th c. (LIPTÁK 1957)	19	80.64	53.49	26.35	19.06
5.	Jászdózsa-Kápolnahalom, 11-14th c. (LIPTÁK 1957)	18	80.08	51.98	25.63	18.80
6.	Zenta-Paphalom, 14-15th c. (BARTUCZ & FARKAS 1958)	33	83.13	50.29	24.50	19.39
7.	Székesfehérvár-Bikasziget, 10-11th c. (ACSÁDI & NEMESKÉRI 1959)	22	83.07	50.53	24.77	19.50
8.	Gáva-Vásártér, 11th c. (NEMESKÉRI et al. 1961)	5	84.61	49.94	25.25	20.80

Table 12. (Cont. 1)

No.	Characteristics / Series	N	17x100 (1+8):2	48x100 17	52x100 17	54x100 45
9.	Orosháza-Rákóczitelep, 10-12th c. (LIPTÁK & FARKAS 1962)	75	81.09	52.58	25.31	18.53
10.	Fonyód, 13-15th c. (DEZSŐ et al. 1963)	25	85.38	50.35	25.10	18.30
11.	Téglás-Angolkert, 11-14th c. (LIPTÁK & MARCSIK 1965)	14	77.71	50.97	26.00	17.40
12.	Békés-Povádzug, 10-12th c. (LIPTÁK & FARKAS 1967a)	31	83.70	51.39	25.15	19.63
13.	Szatmaz-Vasútállomás, 10-12th c. (LIPTÁK & FARKAS 1967b)	52	83.21	51.53	25.51	18.87
14.	Aldebrő-Mocsáros, 10-11th c. (MARCSIK 1967)	4	82.69	52.91	27.52	19.19
15.	Sárbogárd, 10th c. (ÉRY 1968)	14	82.91	48.89	24.56	19.84
16.	Kardoskút-Fehértó, 11-12th c. (MARCSIK 1970)	63	82.34	52.60	25.12	18.84
17.	Kál, 10th c. (ÉRY 1970)	18	82.47	48.42	24.67	19.24
18.	Helemba-Sziget, 13-17th c. (WENGER 1971)	18	81.91	49.26	24.53	14.06
19.	Tengelic, 10th c. (ÉRY 1971)	10	80.63	51.40	25.85	19.76
20.	Oroszvár, 10-12th c. (BOTTYÁN 1972)	20	81.87	50.01	25.45	19.63
21.	Nagytálya, 13-16th c. (KOROMPAI 1974)	16	82.46	49.32	25.61	18.62
22.	Tiszalök-Rázompuszta, 11th c. (LOTTERHOF 1974)	13	85.16	47.61	24.77	17.26
23.	A group, 10th c. (ÉRY 1978)	23	83.37	52.17	25.51	19.12
24.	B group, 10th c. (ÉRY 1978	15	80.80	51.21	25.41	19.01
25.	C group, 10th c. (ÉRY 1978)	72	81.65	50.39	25.89	19.34
26.	D group, 10th c. (ÉRY 1978)	9	81.30	53.14	26.89	18.98
27.	Esztergom-Vasútállomás, 11-12th c. (PAP 1979a)	11	82.45	51.15	26.41	18.12
28.	Nagykőrös, 11-13th c. (PAP 1979b)	14	83.59	51.34	25.66	19.62
29.	Taliándörögd, 12-13th c. (ÉRY 1979)	12	83.18	50.50	24.45	18.93
30.	Szabolcs-Petőfi utca, 10-12th c.	12	81.56	51.32	25.14	20.00

Table 13. Comparison of craniological series ♂ and ♀

No.	Characteristics / Series	N min.	N max.	Praeauricular facio-cerebral index
1.	Pusztapáka (Kiskunfélegyháza), 11th c.	27	36	87.32
2.	+ Fiad-Kérpuszta, 11th c.	-	147	88.10
3.	Veszprém-Kálváriadomb, 10-11th c.	24	28	90.35
4.	Cegléd, 11-12th c.	29	37	90.72
5.	Jászdózsa-Kápolnahalom, 11-14th c.	27	40	91.41
6.	Zenta-Paphalom, 14-15th c.	33	78	89.76
7.	Székesfehérvár-Bikasziget, 10-11th c.	24	36	90.52
8.	Gáva-Vásártér, 11th c.	6	13	90.20
9.	Orosháza-Rákóczitelep, 10-12th c.	74	144	90.28
10.	+ Fonyód, 13-16th c.	-	76	90.50
11.	Téglás-Angolkert, 11-14th c.	18	27	91.51
12.	Békés-Povádzug, 11-12th c.	30	59	88.51
13.	Szatymaz-Vasútállomás, 11-12th c.	108	127	89.05
14.	Aldebrő-Mocsáros, 10-11th c.	8	9	88.89
15.	Sárbogárd, 10th c.	16	28	89.02
16.	Kardoskút-Fehértó, 11-12th c.	99	193	91.58
17.	Kál, 10th c.	22	34	89.46
18.	+ Helemba-Sziget, 13-17th c.	-	34	90.40
19.	Tengelic, 10th c.	9	20	91.89
20.	Oroszvár, 10-11th c.	23	36	88.33
21.	Nagytálya, 13-16th c.	5	32	91.17
22.	Tiszalök-Rázompuszta, 11th c.	15	41	86.58
23.	A group, 10th c.	46	53	91.46
24.	B group, 10th c.	18	35	83.82
25.	C group, 10th c.	89	138	89.65
26.	D group, 10th c.	13	24	91.72
27.	Esztergom-Vasútállomás, 12-13th c.	4	22	91.71
28.	Nagykőrös, 11-13th c.	4	36	90.34
29.	Tallándörögd, 12-13th c.	9	24	89.41
30.	Szabolcs-Petőfi utca, 10-12th c.	11	38	90.79

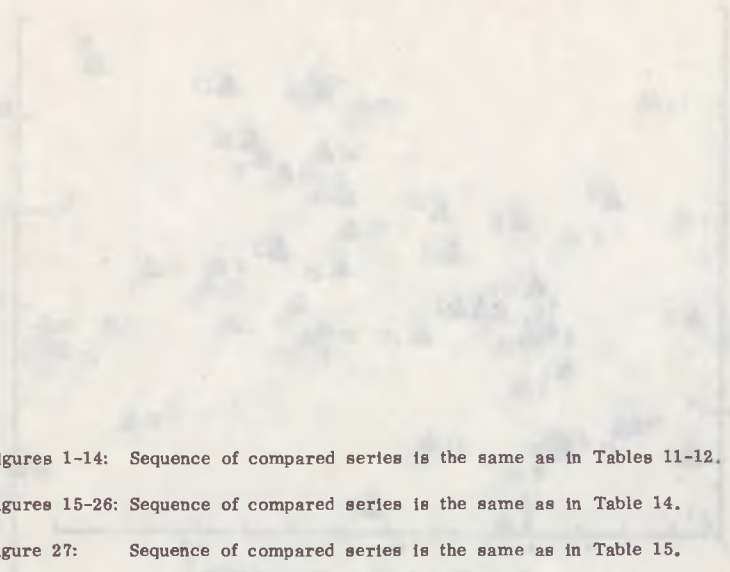
+ T. TÓTH's data (1973)

Table 14. Comparison of some facial flatness' data ♂ and ♀

No.	Characteristics / Series	Males							Females						
		NM	ZA	DC	DS	SC	SS	$M75_1$	NM	ZA	DC	DS	SC	SS	$M75_1$
1.	Europoids	137.0	125.4	-	13.0	-	5.0	33.0	137.0	125.4	-	13.0	-	5.0	33.0
2.	Mongoloids	148.6	141.6	-	8.3	-	2.2	17.6	148.6	141.6	-	8.3	-	2.2	17.6
3.	Conquering Hungarians	139.1	128.2	20.8	12.7	8.8	4.9	29.1	140.9	131.2	20.1	11.3	9.2	4.1	25.9
4.	Helemba-Sziget, 13-17th c.	138.0	124.6	20.7	13.3	9.0	5.1	30.8	139.0	128.9	20.1	12.0	10.4	4.5	28.2
5.	Oroszvár, 10-11th c.	137.8	123.5	21.1	13.3	9.8	4.9	28.5	137.5	122.6	20.7	11.9	9.5	4.7	28.6
6.	Nagykőrös, 11-13th c.	137.9	123.9	22.5	12.1	9.6	5.0	26.6	138.0	118.0	20.9	11.1	9.7	4.7	28.7
7.	Esztergom-Vasútállomás 11-12th c.	141.9	131.5	22.2	12.2	9.7	4.5	-	140.7	125.1	20.7	11.8	9.5	4.2	-
8.	Szabolcs-Petőfi utca, 10-12th c.	137.9	127.9	21.7	10.4	8.7	5.3	24.6	140.4	125.1	19.4	9.1	8.9	4.4	30.0

Table 15. Comparison of some craniological series ♂ and ♀

No.	Series / Characteristics	N	PFC	IC
1.	Europoids, Medieval Epoch, North Region SU (DEBETS 1961)	177	89.9	10.6
2.	Europoids, Medieval Epoch, South Region SU (DEBETS 1961)	251	90.0	4.1
3.	Europo-mongoloids, Medieval Epoch, North Region SU (DEBETS 1961)	1080	92.0	29.4
4.	Mongoloids, Medieval Epoch, SU (DEBETS 1961)	94	98.2	87.7
5.	Conquering Hungarians (DEBETS 1964, TÓTH 1965, 1969)	122	91.5	17.0
6.	Fiad-Kérpuszta, 11th c. (NEMESKÉRI et al. 1953, TÓTH 1958, 1973)	147	88.1	16.3
7.	Orosháza-Rákóczitelep, 11-12th c. (LIPTÁK & FARKAS 1972, TÓTH 1958, 1973)	22	91.2	7.2
8.	Helemba-Sziget, 13-17th c. (WENGER 1971, TÓTH 1973)	34	90.4	3.0
9.	Fonyód, 13-16th c. (DEZSŐ et al. 1963, TÓTH 1973)	76	90.5	19.8
10.	Nagykőrös, 11-13th c. (PAP 1979b)	36	90.3	2.3
11.	Esztergom-Vasútállomás, 11-12th c. (PAP 1979a)	22	91.7	11.3
12.	Szabolcs-Petőfi utca 10-12th c.	38	90.8	12.8

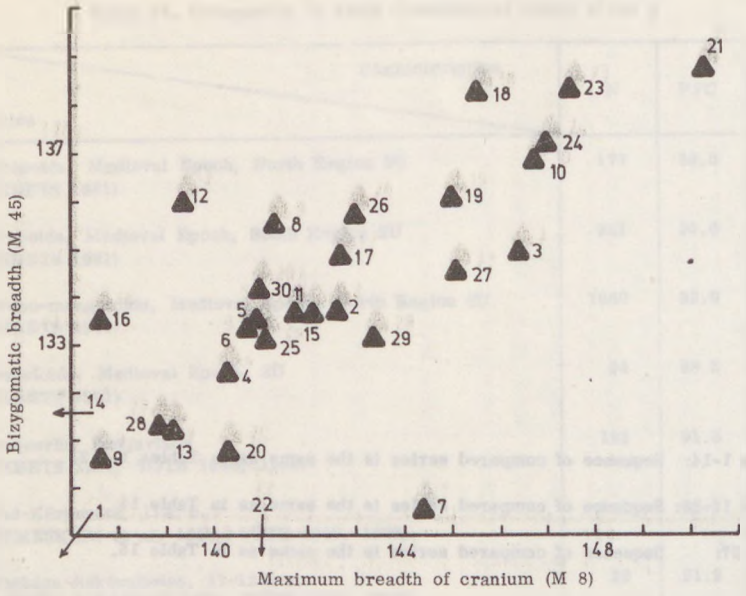


Figures 1-14: Sequence of compared series is the same as in Tables 11-12.

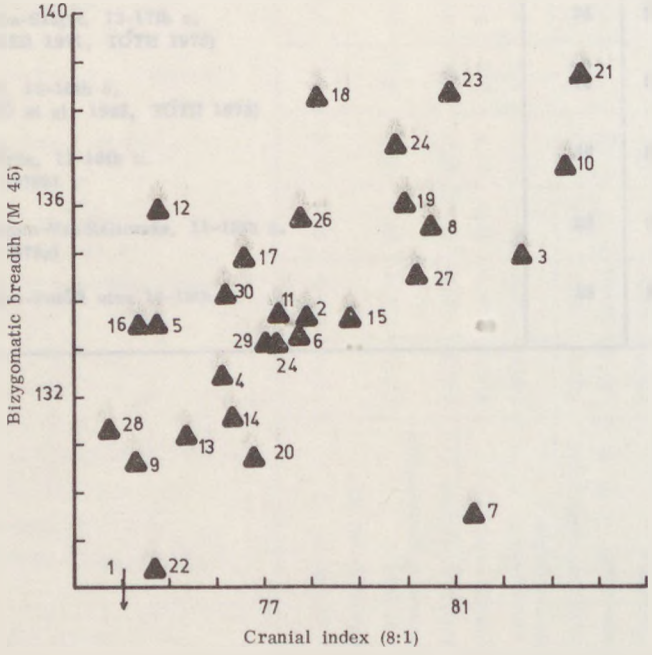
Figures 15-26: Sequence of compared series is the same as in Table 14.

Figure 27: Sequence of compared series is the same as in Table 15.

1

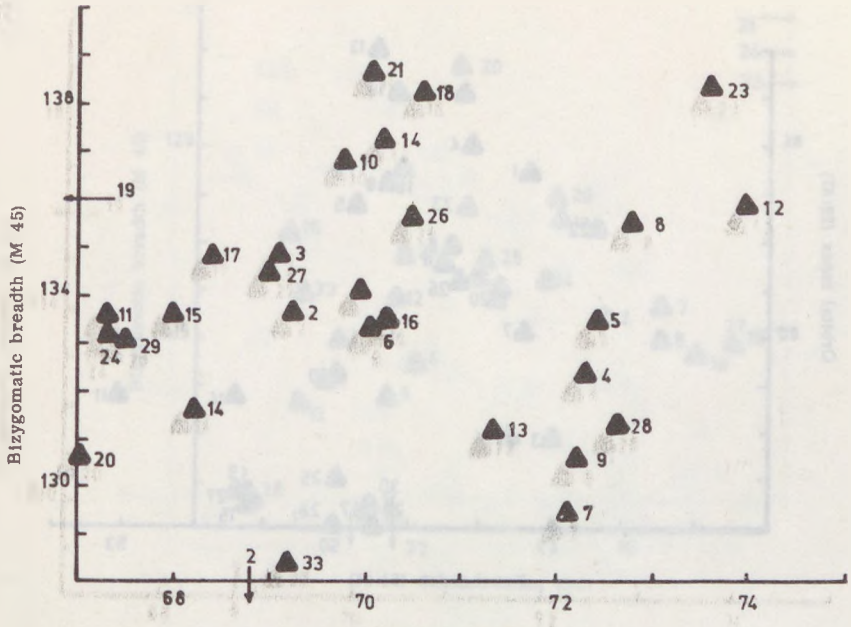


2

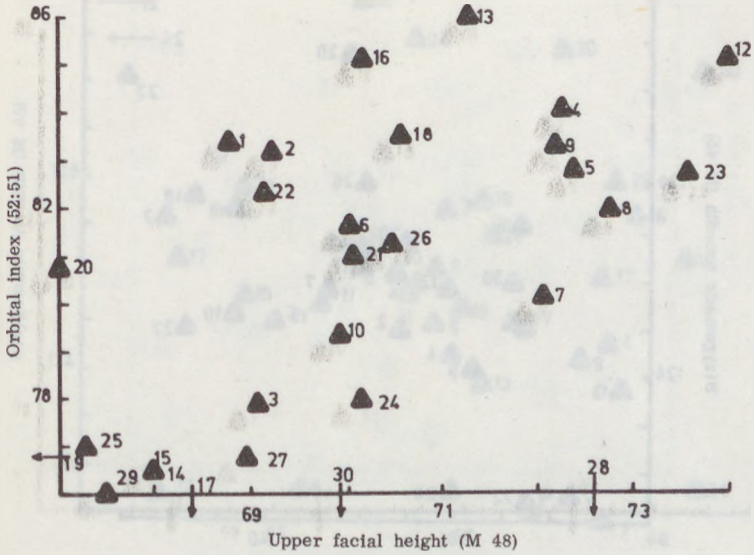


Figs. 1-2. Comparison of male series

3

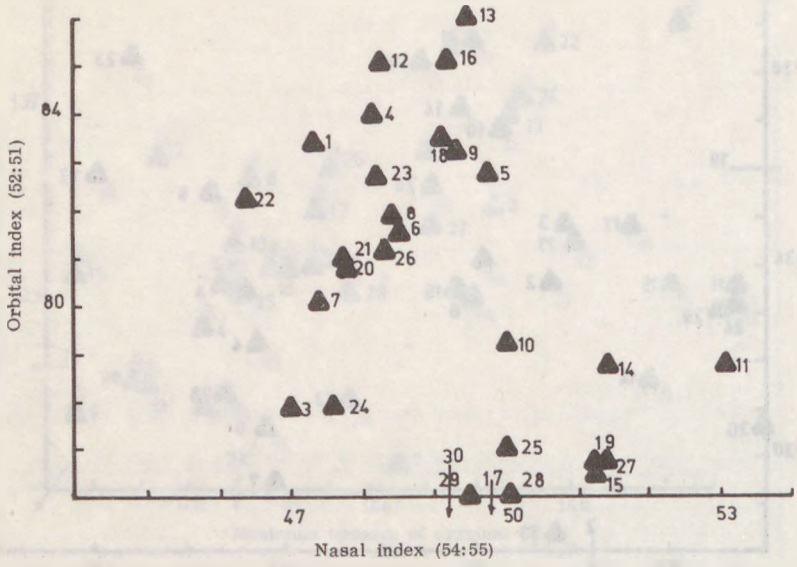


4

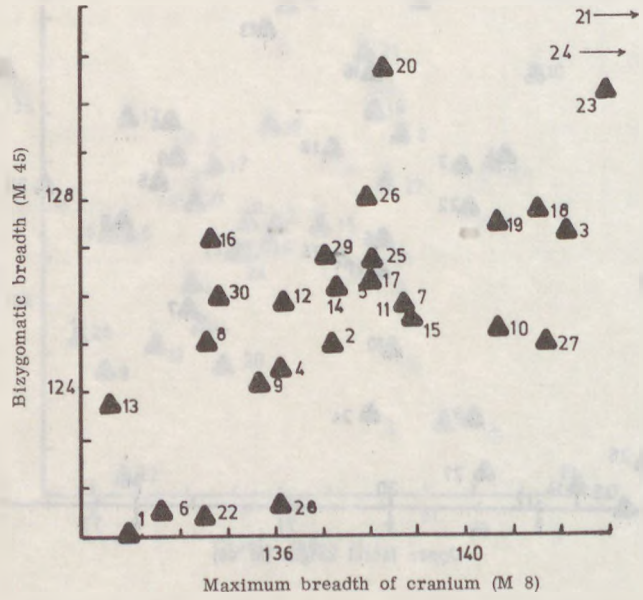


Figs. 3-4. Comparison of male series

5

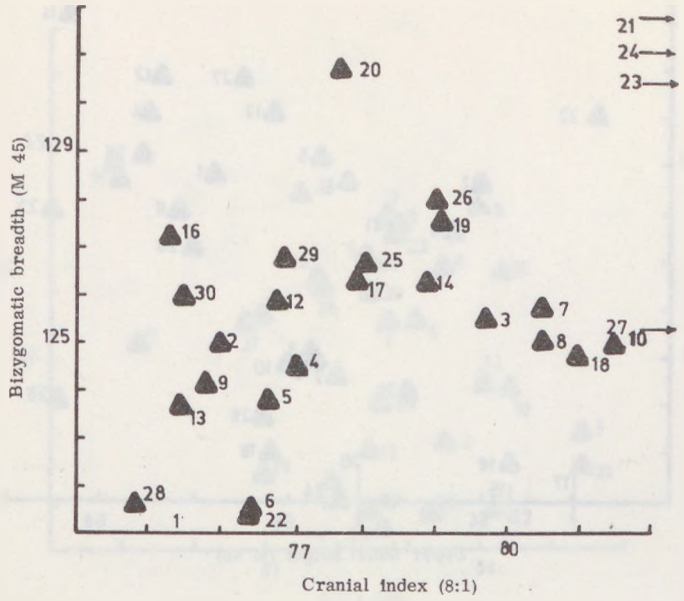


6

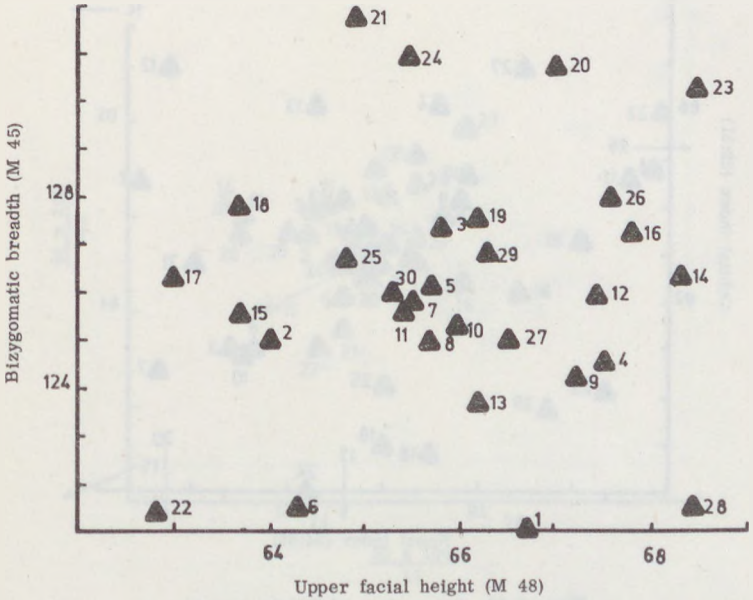


Figs. 5-6. Comparison of male and female series

7

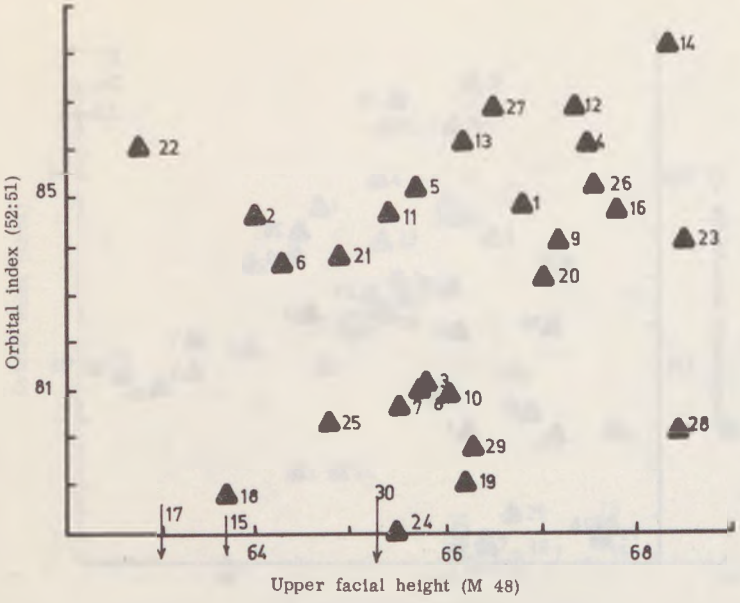


8

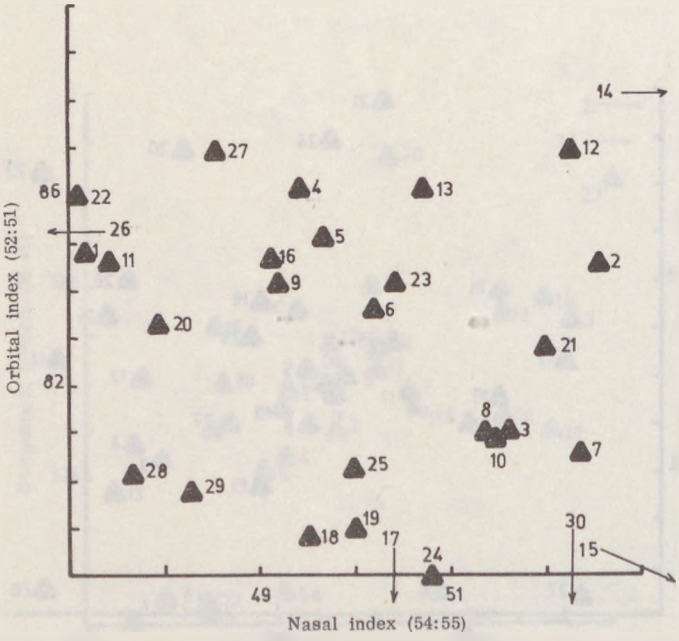


Figs. 7-8. Comparison of female series

9

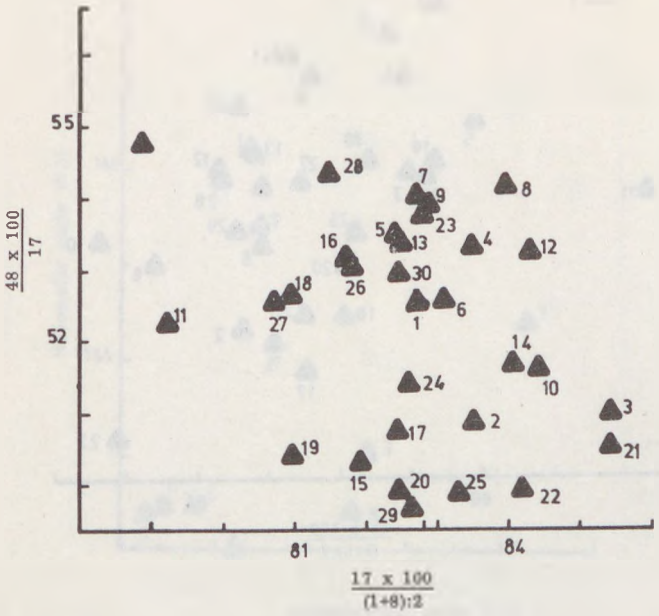


10

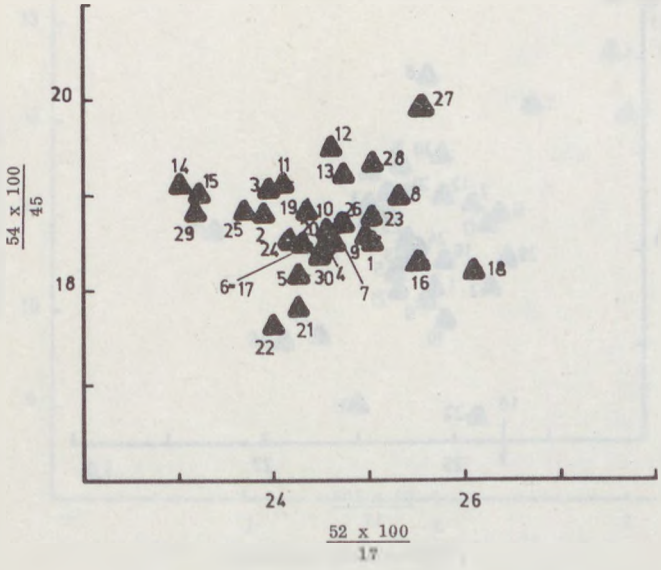


Figs. 9-10. Comparison of female series

11

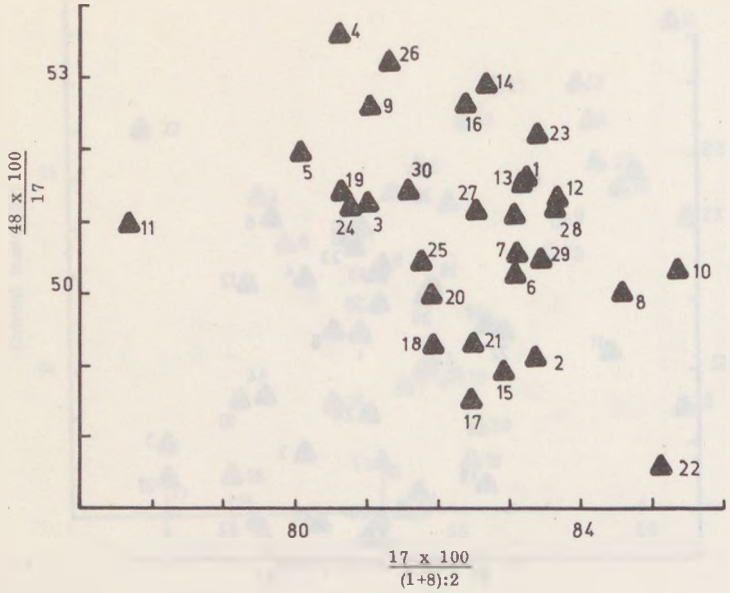


12

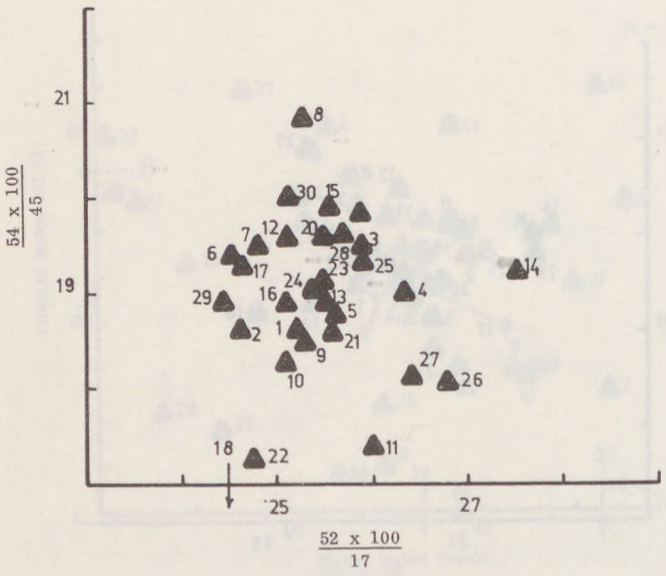


Figs. 11-12. Correlation of male series

13

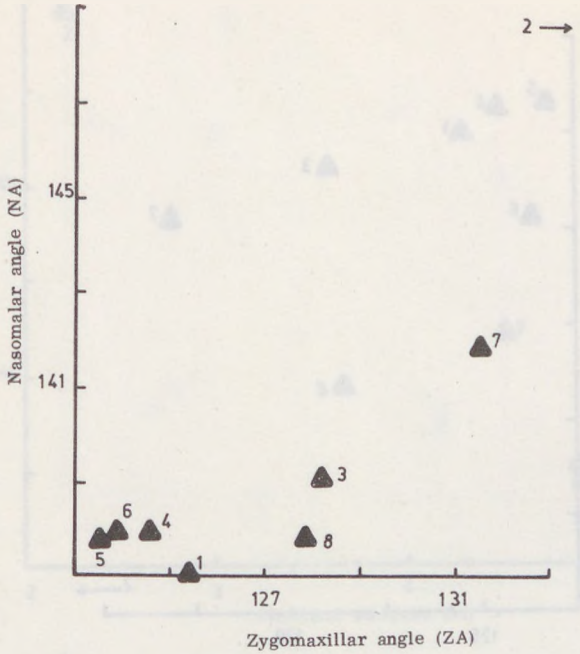


14

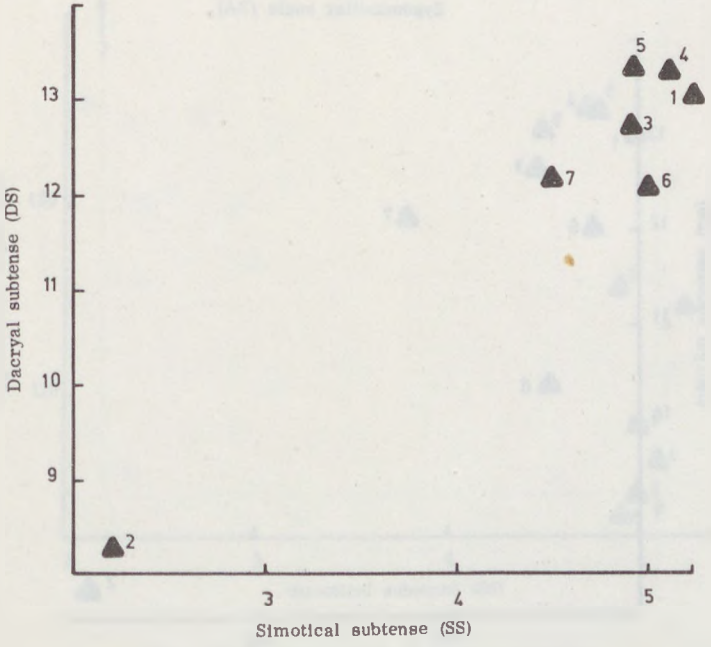


Figs. 13-14. Correlation of female series

15

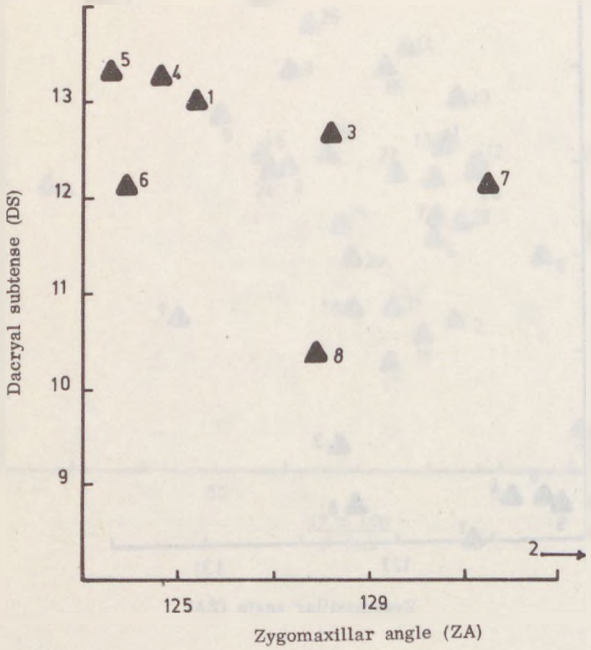


16

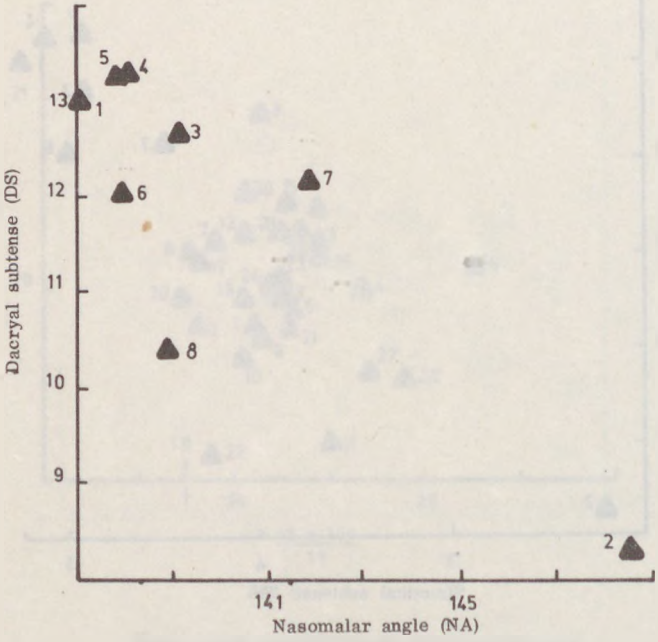


Figs. 15-16. Comparison of some male series

17

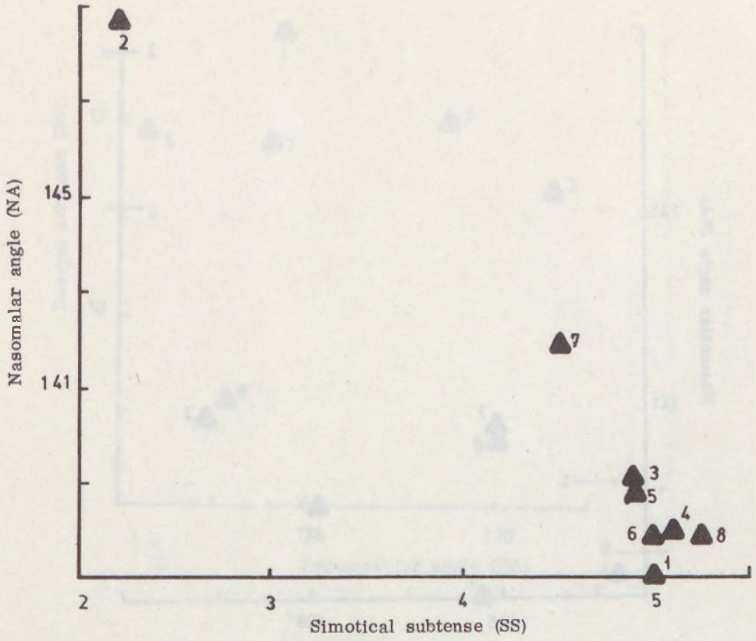


18



Figs. 17-18. Comparison of some male series

19



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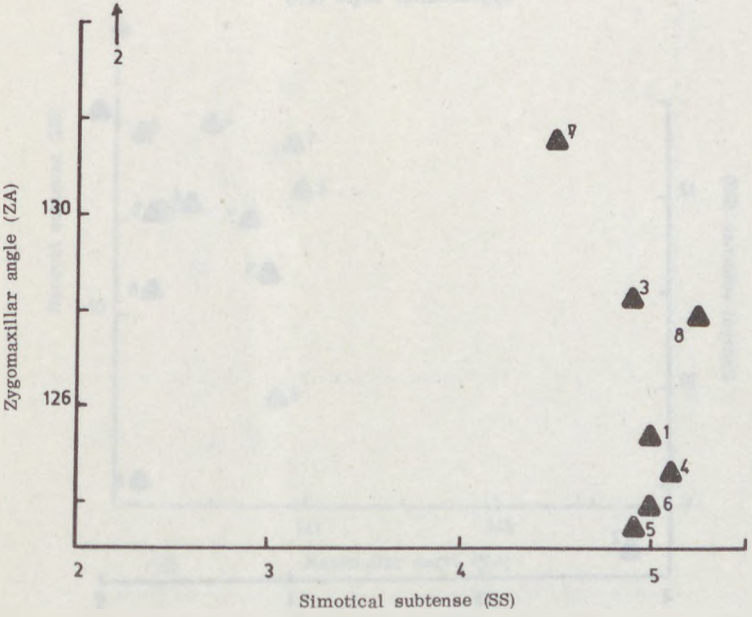
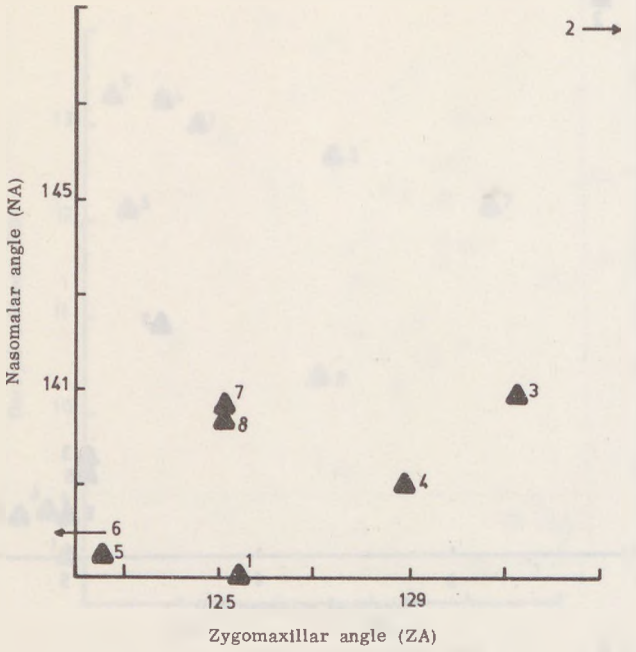


Figs. 19-20. Comparison of some male series

21



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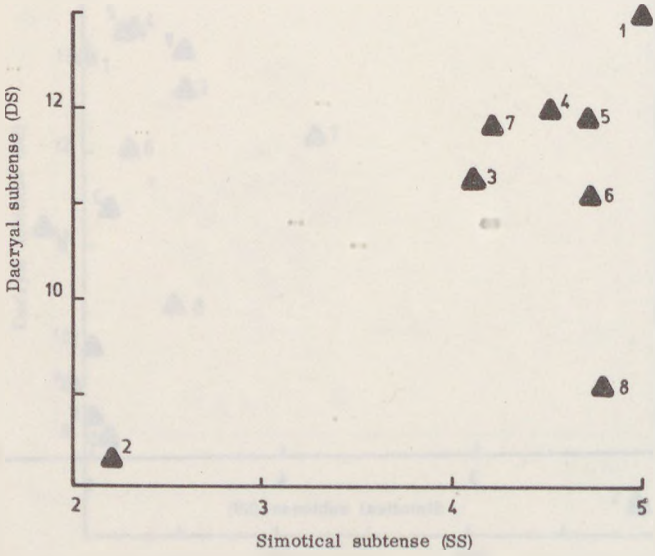
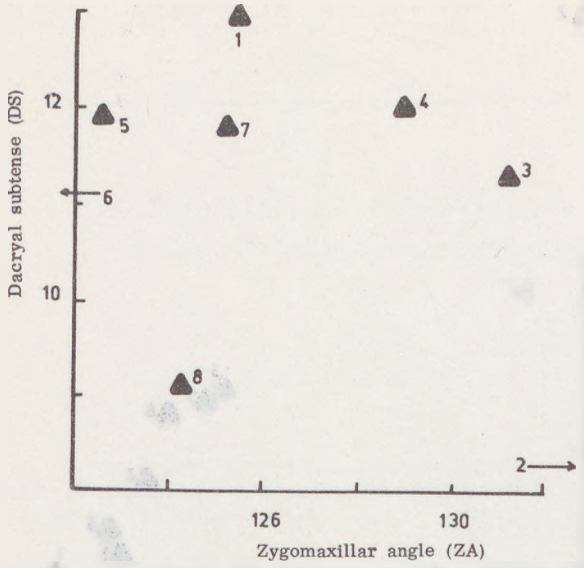
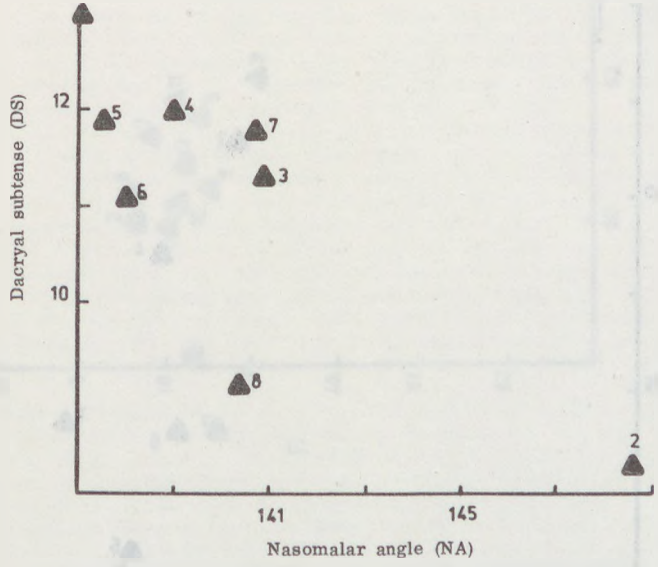


Figs. 21-22. Comparison of some female series

23

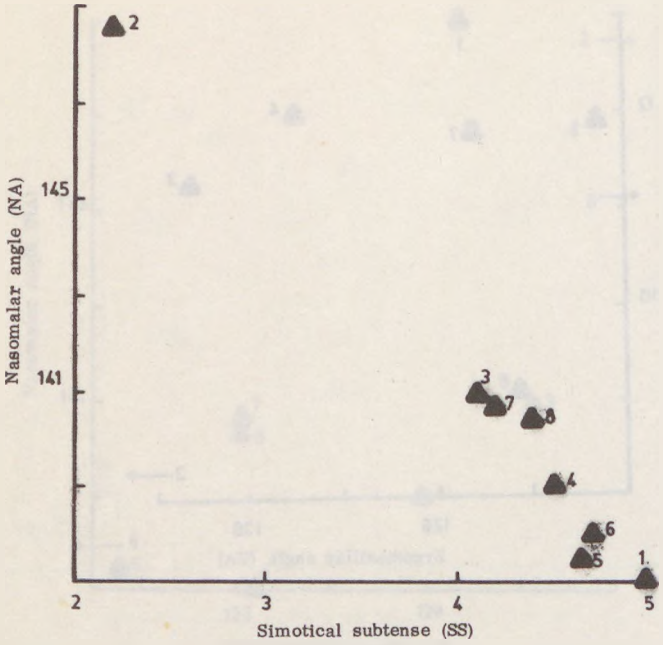


24

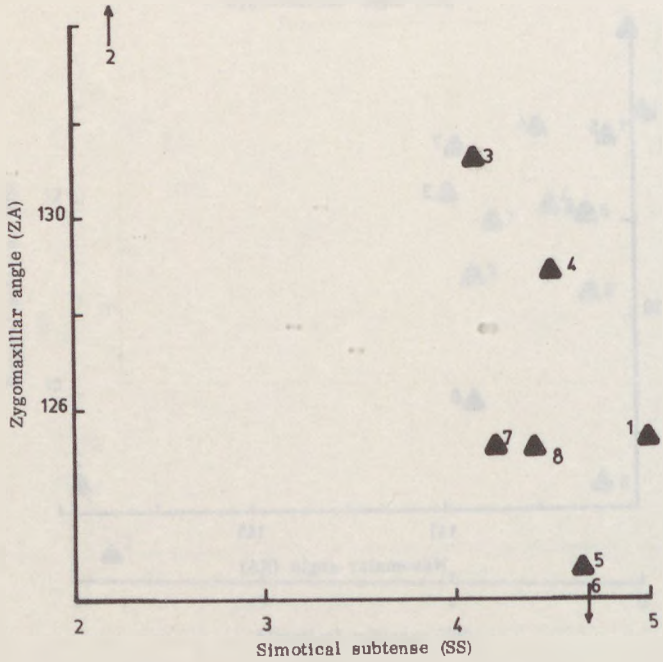


Figs. 23-24. Comparison of some female series

25



26



Figs. 25-26. Comparison of some female series

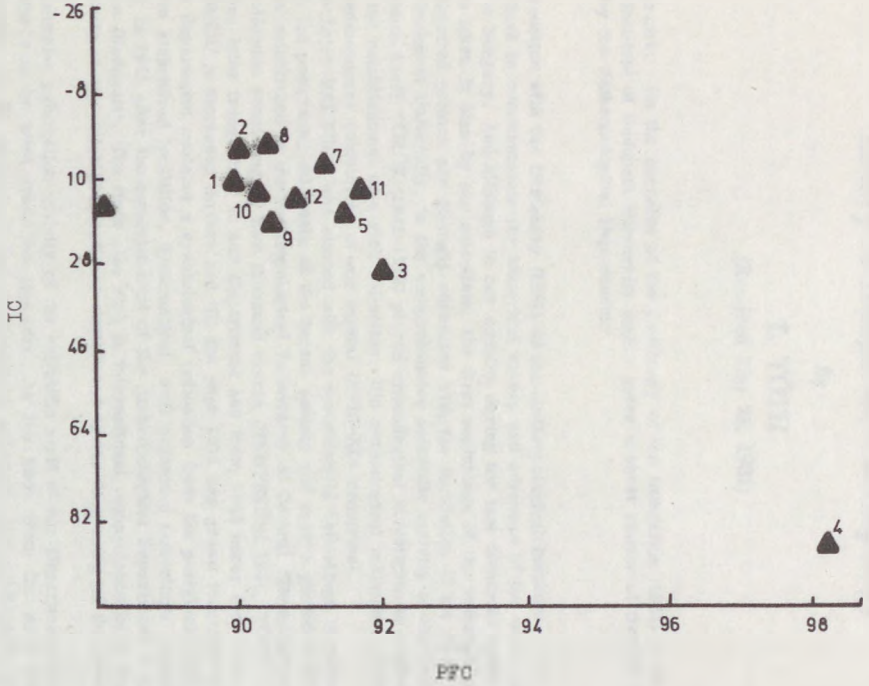


Fig. 27. Comparison of some craniological series

ANTHROPOLOGIA HUNGARICA

XVII. 1980-1981 p. 109-121

The Anthropological Department in the history of Hungarian anthropology

By

T. TÓTH

(Received May 22, 1981)

Abstract: On the occasion of the Centenary of the foundation (1881) of the Anthropological Institute of Budapest University author gives a short rewiev of the scientifical work done by the Anthropological Department.

In connection with the Centenary (1881) of the Anthropological Institute of the Budapest University we have to commemorate the historical events and advances of the whole field of the anthropology in Hungary. And although in our country during the last centuries again and again an interest was taken in Man by our scientists, the first beginnings of the anthropology as a systematicaly cultivated science are strongly connected with the foundation of the Anthropological Institute of the Budapest University. In the comprehensive scientific activity of the founder of the Institute, Professor Aurél TÖRÖK (1842-1912) played craniological investigations a great part, and this led to the establishment of a rich collection. His craniological collection originated mainly from the contemporary cemeteries of our capital (XVIII-XIX centuries).

It was Lajos BARTUCZ who started with the systematical collectings of paleoanthropological series from the postglacial millennia of the human society and over a period of 20 years (1920-1940) he has established in the Anthropological Laboratory of Central Ethnographical Museum (Budapest) a collection consisting of four thousand crania (NEMESKÉRI 1961, TÓTH 1974). This rich collection was later transferred to our Department and from 1945 under the direction of the head Dr. NEMESKÉRI it increased further and till the year 1971 has grown threefold (TÓTH 1971). At present our Department contains a craniological collection from the postglacial millennia excavated on more than sixhundred localities. Systematical, well organized collectings of postcranial finds started only in 1945 after the establishment of the Anthropological Department in the Natural History Museum (Budapest). The finds also rich in international comparisons have enabled the systematical activity of our scientific staff and contributed to the increasing of the results of Hungarian anthropology.

The intensive publication activity of the scientific staff of our Department during the last three decades may be seen from the appendix. As the finds from the Avar Period and Arpadian Age amount to 50 percent of the craniological collection the publication activity concentrated mainly on the investigations carried out on the series of the two above mentioned periods.

From the beginning of the scientific research work in our Department (i.e. from 1945) up to the present following research workers participated in it: J. NEMESKÉRI (1945-1965)[x], S. WENGER (1945-1978), M. MALÁN (1948-1962), P. LIPTÁK (1949-1960), E. BÁTAI (1951-1953), M. DEÁK (1951-1955), T. TÓTH (1958-), A. THOMA (1960-1964), Gy. DEZSŐ (1960-1968), K. ÉRY (1962-1970), O. BOTTYÁN (1965-1975), Zs. TAJTI (1970-1971), E. LOTTERHOF (1971-1977), I. PAP (1975-), M. FERENCZ (1977-), E.F. KIS (1978-).

[x] The data in parentheses indicate the chronological interval of the scientific activity of mentioned research worker.

During the last three decades the activity of the members of our staff have been influenced by different conceptions which have found their expressions in their papers, too. From the papers listed in appendix it emerges that into the analyses of the finds were drawn paleodemographical and paleopathological observations, too. A significant part of the listed papers is dealing with paleobiological reconstructions and with the anthropological problems of ethnogenesis. The main taxonomical connections between neuro- and splanchnocranium, the analysis of the processes brachycephalization and gracilization, the morphological correlations existing between different parts of splanchnocranium have been taken into account by all of the members of our staff. With the increasing number of the papers raised the possibility and the claim to a comparative analysis. According to this aim the members of our staff extended their comparative analysis to recognize the morphogenetic trends over the craniological finds not only from the Central Danubian Basin, but from some subcontinental areas of Eurasia, too.

In the first decade of the Anthropological Department both demographical and taxonomical conceptions became effective (NEMESKÉRI, LIPTÁK), whereas later the questions of the diagnostical significancy of some traits and those of the morphological modifications have been analysed. These ideas find their expressions in different proportions in the explanations of the anthropological composition, respectively origin of the historical populations.

The candidate and doctoral dissertations of two members from our staff (LIPTÁK 1957, 1970; TÓTH 1958, 1977) were founded on the craniological collection of the Anthropological Department.

In addition, the material of our collection were the objects of other paleodemographical and demographical (ACSÁDI & NEMESKÉRI 1970) as well as of paleopathological (REGÖLY-MÉREI 1962) and paleoserological monographies (LENGYEL 1972). A number of important informations about the caries (SCHRANZ & HUSZÁR 1962) and abrasion (HUSZÁR 1976) of the dental system of prehistoric populations have been got from the collection of our Department.

During the last decades the Anthropological Department has been visited by more than 90 research workers from abroad, some of them have carried out investigations on different craniological series of our collection (H. BRABANT, L. BRACE, E. BREITINGER, V.V. BUNAK, M. CAPPIERI, G.F. DEBETS, D. FEREMBACH, D. FRAYER, M.M. GERASIMOV, V.V. GINSBURG, I.I. GOHMAN, W.W. HOWELLS, M.G. LEVIN, C. MAXIA, S. MOLNAR, H.W. PIA, R.RIQUET, D.G. Rohlin, I. SCHWIDETZKY, T.A. TROFIMOVA, H. ULLRICH, M. WOLPOFF).

In the last years wide ranging metric analyses of the postcranial skeletal parts were began in connection with paleosomatological reconstructions included not only an estimation of body height, but that of body weight, too. Looking over the contents of the papers listed in appendix it will be clear that all of the research workers of the Anthropological Department contributed to the obtained results on the field of general paleoanthropology and ethnogenesis of Hungarians as well as to the increasing of the interdisciplinary effectiveness of the Hungarian anthropology.

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LENGYEL, I.A. (1975): Palaeoserology. Blood typing with the fluorescent antibody method. - Akadémiai Kiadó, Budapest, 240 pp.

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NEMESKÉRI, J. (1961): Fifteen years of the Anthropological Department of the Hungarian Natural History Museum (1945-1960). - Ann.Hist.-nat.Mus.Nat.Hung., 53: 625-639.

REGÖLY-MÉREI, Gy. (1962): Palaeopathologia II. /Palaeopathology II./ - Medicina, Budapest, 228 pp.

SCHRANZ, D. & HUSZÁR, G. (1962): Caries findings on prehistoric human dentitions from Hungary. - Z. Morph.Anthrop., 52: 141-154.

TÓTH, T. (1958): Profilation horizontale du crâne facial de la population ancienne et contemporaine de la Hongrie (Problème de l'origine des Hongrois). - Cran.Hung., 3: 3-126.
TÓTH, T. (1971): Twenty-five years (1945-1970) of the Anthropological Department Hungarian Natural History Museum. - Anthrop.Hung., 10: 5-30.
TÓTH, T. (1974): Somatologia i paleoantropologia naselenia Vengrii /Somatology and Paleoanthropology of the Hungarians/. Doct. dissertation I-II. - Budapest, 649 pp.
TÓTH, T. (1977): Somatologia i paleoantropologia naselenia Vengrii /Somatology and Paleoanthropology of the Hungarians). Doct. theses. - Moskva 35 pp.

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APPENDIX

Departmental publications of the research staff
(1950-1980)

1. ACSÁDI, Gy., CSIZMADIA, S., LIPTÁK, P., NEMESKÉRI, J., & TARNÓCZY, T (1953): Az ivádi embertani kutatások. I. /Anthropological investigations from Ivád. I./. - MTA Biol. Oszt.Közl., 2: 137-243.
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3. ACSÁDI, Gy. & NEMESKÉRI, J. (1957a): Contribution a la reconstruction de la population de Veszprém, X^e et XI^e siècles. - Ann.Hist.-nat.Mus.Nat.Hung., 49: 435-467.
4. ACSÁDI, Gy. & NEMESKÉRI, J. (1957b): Paläodemographische Probleme. - Homo, 8: 133-148.
5. ACSÁDI, Gy. & NEMESKÉRI, J. (1958): La population de la Transdanubie Nord-Est X^e et XI^e siècles. - Ann.Hist.-nat.Mus.Nat.Hung., 50: 359-415.
6. ACSÁDI, Gy. & NEMESKÉRI, J. (1959): La population de Székesfehérvár, X^e et XI^e siècles. - Ann.Hist.-nat.Mus.Nat.Hung., 51: 493-564.
7. ACSÁDI, Gy. & NEMESKÉRI, J. (1960): La population de Székesfehérvár, X^e et XI^e siècles. - Ann.Hist.-nat.Mus.Nat.Hung., 52: 481-495.
8. ACSÁDI, Gy., NEMESKÉRI, J. & HARSÁNYI, L. (1959): Analyse des trouvailles anthropologiques du cimetière de Kérpuszta (XI^e siècle) sous l'aspect de l'âge (Étude paléodémographique). - Acta Archaeol.Acad.Sci.Hung., 11: 419-455.
9. BACKHAUSZ, R. & DEÁK, M. (1952): The frequency of occurence of the secretor character in Hungary. - Ann.Hist.-nat.Mus.Nat.Hung., 44: 199-203.
10. BACKHAUSZ, R.& NEMESKÉRI, J. (1955): Résultats des recherches séro-anthropologiques effectuées au Bodrogköz (Hongroi Nord-est). - Journ.Gen.Hum., 4: 219-233.
11. BACKHAUSZ, R.& NEMESKÉRI, J. (1961): Häufigkeit der ABO-Blutgruppen und des D-Faktors in Ungarn. - Zschr.Morph.Anthr., 51: 103-115.
12. BÁTAI, B.E. (1952): A váchartyáni avar temető csontvázleleteinek embertani vizsgálata (Le cimetière avar de Váchartyán). - Ann.Hist.-nat.Mus.Nat.Hung., 44: 213-223.
13. BOTTYÁN, O. (1966): Data to the Avar Period population of Budapest. - Anthrop.Hung., 7: 3-33.
14. BOTTYÁN, O. (1967a): Antropometriai adatok osztályozásának néhány problémája (Einige Probleme der Klassifikationen Anthropometrischer Daten). - Anthrop.Közl., 11: 87-102.

15. BOTTYÁN, O. (1967b): Data to the anthropology of the Hun Period population in Hungary. - Ann.Hist.-nat.Mus.Nat.Hung., 59: 455-464.
16. BOTTYÁN, O (1968a): An analysis of the palatal measuring methods. - Ann.Hist.-nat.Mus. Nat.Hung., 60: 297-311.
17. BOTTYÁN, O. (1968b): The outlines of an anthropological reconstruction of the cemetery (XI-XV c.) at Sopronbánfalva, West-Hungary. - Anthrop.Hung., 8: 97-120.
18. BOTTYÁN, O. (1969): On the problem of correlation between the alveolar profile angle and some maxillary indices. - Ann.Hist.-nat.Mus.Nat.Hung., 61: 413-423.
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PARASITOLOGIA HUNGARICA
STUDIA BOTANICA HUNGARICA
FRAGMENTA MINERALOGICA et PALAEONTOLOGICA
ANTHROPOLOGIA HUNGARICA
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