ANTHROPOLOGIA HUNGARICA

STUDIA
HISTORICO — ANTHROPOLOGICA

Tom. XVIII. 1982-1983.

ANTHROPOLOGIA HUNGARICA

STUDIA
HISTORICO — ANTHROPOLOGICA

Tom. XVIII. 1982-1983.

Sectio Anthropologica
Musei Historico-naturalis Hungarici
Budapest

Redigit
DR. T. TÓTH

ISSN 0574-3842

Anthrop. Hung. XVIII. 1982-1983.

Conspectus materiarum

Sándor Wenger
(1916-1983)

ANTHROPOLOGIA HUNGARICA

XVIII. 1982-1983 p. 5—7

In memoriam Sándor Wenger (1916-1983)

By

T. TÓTH

(Received November 29, 1983)

In the 67th year of his life Sándor WENGER died on the 17th of July, 1983 after a long and severe disease. He was deputy leader of the Anthropological Department of the Hungarian Natural History Museum. He retired in August, 1979.

He was born in Debrecen, on the 19th of July, 1916. Having completed his university studies he graduated at the University in Kolozsvár (Cluj); in the Institute for Anthropology of the same University directed by Prof. Mihály MALÁN, in the years of 1940-1944 at first he was employed as a junior clerk, later as an assistant. From January 1945 he took part in the re-arrangement of the scientific collection of the Hungarian National Museum and in that of its Botanical Department as well as in the removal of this Department. Having finished these works he did his best to establish an anthropological collection and to arrange the newly organized Anthropological Department of the Hungarian Natural History Museum. Under the leadership of Dr. János NEMESKÉRI he participated in the next twenty years in the conservation of the anthropological find which comprised many thousands of osteological remains. In this period he participated in the keeping and registration of the anthropological collections kept in the central Department as well as in the county museums (Pécs, Győr, Veszprém, Székesfehérvár, Debrecen). He was for years the registrar of the collection kept in the Anthropological Department. In the years 1945-1965 he was very active in the propagation of popular science. He held lectures in the people's high school, in factories, during the excavations in the country in the Hungarian Radio and Television. For years he was the president of the Biological Agricultural Committe of the Budapest Organisation of the Society for Propagation of Sciences. He participated in the arrangement of the new exhibitions of the Natural History Museum on human origin (1955, 1962). He held more than one hundred lectures in this exhibition and was the author of a great number of popular works about anthropogenesis and human races. In the years 1950-1955 he participated in the investigations carried out on the physical status of Budapest students as well as in the processing of the statistical data and their evaluation. He was member of the team studying in these years the ethnic anthropology of the region Bodrogköz.

WENGER held different voluntary public engagements in the Natural History Museum. In the years 1962-1973 he was elected member of the executive committee of the Anthropological Section of the Hungarian Biological Society. In the sessions of the mentioned Section he also held a number of lectures.

In December 1966 he took his Ph.D. degree "summa cum laude" in anthropology at the József Attila University in Szeged.

During the second part of his activity (1965-1979) he payed increased attention to elaborating the collected material and to pertaining methodical problems. Many of his publications have aroused interest of anthropologists in different countries, being obvious from the recognitive reviews written by H. VALLOIS, I. SCHWIDETZKY, M.C. CHAMLA, V.P. ALEXEYEV, K. GERHARDT and J. JELINEK. He was among the participants of two Hungarian Anthropological Symposia (1959, 1967) and of the Fifth International Finno-Ugric Con-

gress (Budapest, 1975). He was particularly interested in the anthropological investigations carried out by French, Italian, Austrian and Roumanian scientists. He held some lectures on this subject in the conferences in the Anthropological Department. He made two study tours to Roumania where he was working on finds conservation and took part in consultations in some institutions (1956, 1958). He received invitations to many international congresses (San Remo 1956, Paris 1960, Eperjes 1971, Brno 1975, Tokyo 1968, Chicago 1973), to the Prehistorical and Ancient Historical Congresses (Rome 1962, Prague 1966, Nice 1976), to the National Stomatological Conference of the Roumanian Medical Society (Bucarest 1963), to the Thirty-seventh International Congress of Americanists (Argentina 1966) and to the First International Conference on Social Science et Medicine (Aberdeen 1968). He did not attend the above-mentioned congresses.

WENGER's scientific activity found clear expression in the comparative evaluation and publication of the anthropological finds deriving from 7 cemeteries from the Late Roman and 11 cemeteries from the Avar Period, 3 from the Arpadian and the Middle Age. His name is linked with two papers on the anatomical variations, a review about a monograph from abroad, a craniological methodical essay on the adaptation of the Giardina-index. In response to requests by his archeologists he did the age- and sex-determination of the anthropological finds excavated in a number of cemeteries. Inspite of the small number of his publications about different finds it is worth mentioning their volume and detailed documentation. During his research work which lasted nearly four decades he had studied the osteological remains of about 2500 individuals (ca 800 typographical pages). In his studies he had always applied Pál LIPTÁK's taxonomical method. His interpretations were mostly very suggestive. It will be enough to refer to the taxonomical revision done by Lajos BARTUCZ in connection with the Szentes-Kaján population from the Avar Period which was studied by WENGER.

Sándor WENGER's creative work represents a remarkable chapter in the research-history of Hungarian anthropology.

LIST OF S. WENGER'S PUBLICATIONS

1952: Contributions a l'anthropologie des avars en Hongrie (Le cimetière d'Alattyán-Tulát).- Annls hist. -nat. Mus. natn. hung., 44: 205-212.

1953: L'anthropologie du cimetière de Jánoshida - Tótkérpuszta. - Annls hist. -nat. Mus.natn. hung., 45: 231-244.

1955: Szentes-Kaján népvándorláskori népességének embertani típusai (VII-VIII. szd.) (Types anthropologiques de la population de Szentes- Kaján provenant de VII-VIII^{e} siècles). - Annls hist. -nat. Mus. natn. hung., 47: 391-410.

1956a: Les découvertes anthropologiques de Kunszentmárton provenant de la période avare. - Cran. hung., 1 (2): 53-59.

1956b: Nouvelles découvertes au Tiszántúl (au dela de la Tisza) provenant des temps avars.- Cran. hung., 1 (1): 17-24.

1957: Donnée ostéométriques sur le matériel anthropologique du cimetière d'Alattyán-Tulát, provenant de l'époque avare. - Cran. hung., 2 (1): 1-55.

1958: Az antropológia helyzete Romániában (Voyages d'études dans la République Populaire Roumanie). - Anthrop. Közl., 2: 123-132.

1963: DEZSŐ, Gy. & WENGER, S.: Die metrischen Befunde des Schädelmaterials; Metrische Charakterisierung des Skelettmaterials. - in: Die spätmittelalterliche Bevölkerung von Fonyód. Hrg. J. Nemeskéri. - Anthrop. hung., 6: 137-145.

1966: Anthropologie de la population d'Előszállás - Bajcsihegy provenant des temps avars. - Anthrop. hung., 7 (1-2): 115-206.

1967: Adatok az avarkor népességének antropológiájához (Data to the anthropology of the population in the Avar-Age). - Anthrop. Közl., 11: 199-215.

1968a: Data to the anthropology of a Late Roman Period population in the SE Transdanubia. - Annls Hist. -nat. Mus. natn. hung., 60: 313-342.

1968b: Data to the anthropology of the Avar Period population of the Transdanubia. - Anthrop. hung., 8: 59-96.

1970: Data to the anthropology of the Early Árpádian Age population of the Balaton Area. - Anthrop. hung., 9 (1-2): 63-145.

1971a: Anthropological data to the Árpádian Epoch population at the Great Bend of the Danube in Hungary. - Annls hist. -nat. Mus. natn. hung., 63: 421-432.

1971b: Contributions a l'anthropologie de la population Hongroise du Moyen Age. - Anthrop. hung., 10: 91-158.
1972a: Anthropological examination of the osteological material deriving from the Avar Period cemetery at Tiszavasvár (Hungary). - Anthrop. hung., 11: 5-81.
1972b: Data to the anthropology of the Avar Period population in the Northern Plains, Hungary. - Annls hist.-nat. Mus. natn. hung., 64: 401-413.
1973: NECRASOV, O. (1971): Originea si evolutia omoului (Origin and evolution of man) Publishing House Acad. Rep. Soc. Romania, Bucuresti 276 pp. (Book review). - Anthrop. Közl., 17: 167-168. (in Hungarian).
1974a: Anatómiai variációk magyarországi paleoantropológiai leleteken (Anatomical variations in some palaeoanthropological finds from Hungary). - Anthrop. Közl., 18: 229-233.
1974b: Craniomorphological anomalies in the historical populations of the Central Danubian Basin. - Annls Hist.-nat. Mus. natn. hung., 66: 413-427.
1974c: Déldunántul avarkori népességének embertani problémái (On the anthropological problems of the Avar Age populations in the Southern Transdanubia). - Anthrop. hung., 13: 5-86.
1975: Palaeoanthropology of the population deriving from the Avar Period at Fészerlak - puszta (Transdanubia). - Anthrop. hung., 14: 57-110.
1976-77: Analyses anthropologiques de nouvelles découvertes de Keszthely (Transdanubia) provenant de l'époque avare. - Anthrop. hung., 15: 125-190.
1978-79: The application of a new combined index in Home anthropology. - Anthrop. hung., 16: 117-123.

Author's address: DR. TIBOR TÓTH

Anthropological Department
Hungarian Natural History Museum
Budapest, Bajza utca 39.
H-1062

ANTHROPOLOGIA HUNGARICA

XVIII. 1982-1983 p. 9—41

The Avar-age cemetery at Solymár

By

M. FERENCZ

(Received November 2, 1983)

Abstract. The author examines anthropological finds found in the 127 graves of the 7th-8th century cemetery of Solymár. She publishes the averages of measurements and indices, the scale of variations and the dispersion beside the general characterization of the series. She discusses the anatomic variations and anomalies that occur. Finally an evaluation of the primary and secondary taxonomical characteristics and a multi-aspect comparison to other Avar Period series is given.

In 1970 two graves were discovered in the brick-yard of Solymár. Later they were numbered Nos. 63 and 64. The excavations were carried out under the direction of Gy. TÖRÖK, an archeologist, between 1971 and 1974. In the majority 7th century and in a lesser number 8th century graves, a total of 130 came to light from this cemetery which is located 400-500 metres from the railway station of Solymár in the direction of Aquincum. The complete digging up of this cemetery was obstructed by a new clay pit-tip located to the south.

The anthropological remains of 127 individuals from the 130 graves were transferred to the Anthropological Department of the Hungarian Natural History Museum for treatment and preservation.

REMARKS ON METHODOLOGY

The age at the time of death was determined on the basis of the changes occurring on bones in life time and remaining visible on them (ossification of cranial sutures and epiphyses, the wear of teeth, the sequence of teeth eruption, the surface changes of the facies symphyseos of os pubis) (in FARKAS 1972). I applied the MARTIN & SALLER (1957) age-group system. Sexes were determined by the anatomical characteristics demonstrating sexual dimorfism.

I executed the metrical analysis according to the method of MARTIN (1928). Special facial flatness data were taken according to the methodics of DEBETS & TÓTH (in FARKAS 1972).

The averages of dimensions and indices (M), the range of variations (V_{min}-V_{max}) and dispersion (s) were also determined. I applied the categories of DEBETS to evaluate anthropometrical characteristics (ALEXEYEV & DEBETS 1964).

I carried out the evaluation of primary taxonomical characteristics on the basis of the works of DEBETS (ALEXEYEV & DEBETS 1964) and of TÓTH (1958, 1962, 1967, 1968, 1969). In the analysis of secondary characteristics I proceeded according to the taxonomical system of LIPTÁK (1954, 1965, 1969).

Stature was determined by the method of MANOUVRIER (1892) (according to the tables published by MOLLISON in 1938) and by the method of BREITINGER (1938) & BACH (1965).

Comparative examinations were executed by the distance-calculations of PENROSE (1954), by the application of ALEXEYEVA's (1966) special indices, by the praeauricular faciocerebral indices (PFC) recognised and introduced by DEBETS (1964) and by using the facial flatness index (IC) calculated according to the method of DEBETS & TÓTH (in FARKAS 1972).

GENERAL CHARACTERIZATION

The remains of 127 individuals came to light from the 130 graves dug up by archeological methods. Skulls and skeletal bones are available from 110 graves, only skulls are available from 5 graves and only postcranial material is available from 12 graves (Table 1).

In summing up partial results it is visible that 25 (19.7%) children belonging to the age-group Infans I and 9 (7.1%) children belonging to the age-group Infans II, altogether 34 children, 26.8% of all individuals, were buried in this cemetery. This is a low ratio similarly to other Avar Period series. This problem has been studied by various authors (ÉRY 1967, TÓTH 1961, TAJTI & TÓTH 1976-1977). The number of individuals falling in the age-group Juvenis is 8 (6.3%). There are 41 males (32.3%) and 38 females (29.9%) in our cemetery. 41.5% of the males died in adult age and 58.5% of them died in mature age. Only 28.9% of the females lived to mature age, 71.1% of them died already in the adult age (presumably as a result of illnesses related to maternity).

All in all 115 brain-cases were brought to light, 41 male ones, 34 female ones and 40 undeterminable sex (children and juvenile). Only 20 male skulls and 12 female skulls were suitable for detailed metrical analysis. However I have carried out the possible morphoscopical examinations on the fragmentary material, too (Table 2).

The fragmentary conditions of the series are well demonstrated by the fact, that I could determine stature only in 26 cases, although it was possible to examine the postcranial bones of 122 individuals. From these 26 cases well preserved (17 males, 9 females), measurable skulls belonged to 13 male skeletons and to 5 female skeletons, in all other cases skulls were fragmentary.

ANTHROPOLOGICAL ANALYSIS

Brain-cases of males according to the mean-values are medium long, medium wide (the number of wide skulls is also large), medium high. According to the calculated indices they are mesocranic (on the limit of dolichocranic; 13 are dolichocranic, 5 brachycranic, 2 mesocranic), orthocranic, metriocranic, metriometopic. Facial skeletons have the following characteristics: medium wide zygomatic arc, medium bizygomatic breadth. Faces are of medium height, upper faces are low (though the medium high group is also significant). Orbitum are medium wide and medium high. Nasal apertures are medium wide, medium high. Facial skeletons are mesoprosopic, mesen, according to the indices concerned. Orbita is mesoconch, nose is mesorrhine, palate is mesostaphyline (Table 3).

Brain-cases of females according to the mean-values are medium long (but the number of long heads is also considerable), medium wide, medium high. According to the indices female brain-cases are dolichocranic (dolichocranic-mesocranic group), orthocranic, metriocranic, eurymetopic. Facial skeletons are characterized by medium wide zygomatic arcs with medium bizygomatic breadth. Faces are medium high, upper faces are low. Orbitum are medium wide and low. Nasal apertures are medium wide and medium high. Facial skeletons are mesoprosopic, mesen, orbitum are chamaeconch, noses are mesorrhine, palates are mesostaphyline according to the indices (Table 3).

When evaluating morphological marks, the majority of the male skulls' circumferences in norma verticalis are sphenoid, but I have found a significant number of pentagonoids as well. Glabella is markedly developed, but those with a medium degree of development are also frequent. Arcus superciliaris is strong. Protuberantia occipitalis externa is medially developed, those with degree 2 are the most frequent ones. Processus mastoideus is strongly or medially developed. Sulcus praenasalis can be observed at 72.7% on the lower edge of

apertura piriformis. The anthropin form and fossa praenasalis occur with the same frequency. Spina nasalis anterior is broken off in many cases, those which can be seen are mostly medially developed. When studying fossa canina, I have found categories flat, medium deep and deep in the same ratio (22.7%). Alveolar prognathy is mostly moderate. Abrasion of teeth is not very much marked, only 17.6% present some more worn masticatory surfaces.

Female skulls' circumferences in norma verticalis are pentagonoid in the majority of cases. Glabella and arcus superciliaris are weakly developed, mostly belong to degree 1. Protuberantia occipitalis externa is flat, processus mastoideus is small. Sulcus praenasalis can be seen on the lower edge of apertura piriformis at 61.5%, in a high percentage similar to that of the males. Spina nasalis anterior has broken off in almost every case. Fossa canina is most frequently filled up and shallow, but there is a group with very deep fossa canina against it, too. Alveolar prognathy is more expressed than that of the males. At 76% of females there is no abrasion or it has just begun (Table 4).

On the average stature of males is small medium according to the method of MANOUVRIER and it is medium calculated by BREITINGER's method (Table 3). Stature of females on the average is small medium by the process of MANOUVRIER and large medium by that of BACH (Table 3). Individual measurements of males are summarized in Table 5, those of females in Table 6.

ANATOMICAL VARIATIONS AND ABNORMALITIES

I recorded the presence of 13 characteristics in our series. 3 of these can be found on the postcranial part of the skeleton, the others on the skull. The fragmentary, unmeasurable material was also studied. The percentage of the total number of cases was calculated on the basis of the cemetery's total number of graves (127). I have already conditionally indicated the problem in my previous paper (FERENCZ 1981) that arose due to the lack of wearing anomalies of bones. My results are summarized in Table 7. Sutura metopica appears on 10 skulls (4 males, 6 females), this is 7.9% of the population, a higher number than the 5.7% calculated by WENGER (1974) for the Avar Period series of Hungary. On the other hand, I also experienced that it is more frequent with females than with males. Os apicis is perceptible in 12 cases (6 males, 2 females, 1 Juvenis and 2 Infans I and 1 Infans II, these 3 Infans age ones not mentioned in the Table). An interesting feature is the tripartite os apicis of the Infans II. The occurrence frequency of this variation is 9.4% in our cemetery, it is very high when contrasted with the 1.4% of WENGER (1974). Ossa Wormiana cases were grouped by sutures. It can be found most often in the sutura lambdoidea, in 41 individuals (19 men, 17 women, 3 Juvenis, 1 Infans II, 1 Infans I), 32.3% in case of this cemetery. It can be observed in almost equal proportions at the incisura parietalis (6.3%) and in the sutura sagittalis (5.5%). It occurs in 1 Juvenis in the sutura coronalis. The division between sexes is almost equal. The ratio of ossa Wormiana to be found in all sutures is very high, 43.3%, as compared to the average of the Avar Period in Hungary, which is 14.3%. As the Worm type bone occurs in more than one suture on several skulls, less individuals are concerned by this problem than the above ratio would suggest. Os epiptericum can be found on the skulls of 5 males and 2 females altogether in 5.5%. The frequency of this variation is also above average. Os bregmaticum can be seen on the skull of 1 single male representing 0.8% of the population, which strongly reminds of the average of WENGER (1974), which was 0.5%. Bathrocephaly can be registrated in 4 cases (2 males, 2 females): 3.1%. Torus palatinus sagittalis is to be found on the skulls of 2 males and 1 female, 2.4% of the population. It is usually of a moderate type. Perforatio fossae olecrani humeri can be recognized on 15 individuals (6 males, 8 females, 1 Juvenis), representing 11.8% of the population. Sacrum bifidum can be seen on 17 male, 3 female and 1 Juvenis individuals (16.5%). Spondylosis appears in 14.2%. It can be seen on the vertebrae of 17 males and 1 female. As this abnormality can be recognized in 41.5% of all males (mainly in mature age), we may presume, that way of life put a burden on males' spinal colums to a greater extent, than on females' ones. The left upper medial incisivus of the female skull of Grave No. 119 is shovel shaped in moderate form. Caries occurred in many cases. On the male skulls of Grave Nos. 20 and 25 can be seen fistulae.

As a summary it can be stated that anatomical variations and abnormalities occur in a higher than usual ratio within the Avar Period series of Solymár, being more frequent in males than in females.

TAXONOMICAL ANALYSIS

1. Analysis of primary taxonomical characteristics

The purpose of my examination is to separate Europoid and Mongoloid components. It was possible to analyse 15 male and 12 female skulls (Tables 8, 9). Nasomalar angle (Martin 77) values of both sexes, in case of individual data as well as in that of averages, are of Europoid character. On the skull of 1 male (Grave No. 119) I have obtained data similar to the mean value of Europoid and Mongoloid group averages (142.9). Zygomaxillar angle (ZM) values indicate 2 females (Graves Nos. 46, 79) to be intermediary between Europoids and Mongoloids. The data of all other individuals and the averages are of Europoid character. Dacryal subtense (DS) value of 1 male (Grave No. 43) is close to the group average of Europoids and Mongoloids. The DS values of the other males - and as a consequence the average as well - is similar to that of Europoids. The data of the majority of females and because of these the average as well approach the mean value of the group averages of Europoids and Mongoloids. The female skull from Grave No. 59 is closer to the Mongoloids. Simotical subtense (SS) value of the female skull from Grave No. 46 indicates an apparent Mongoloid effect (2.0), while the female skulls of Grave Nos. 119, 125 are approaching the mean value of group averages. Males - and as far as averages are concerned females too - are similar to Europoids. Dacryal index (ID) value of the female skull of Grave No. 112 almost coincides with the average of Mongoloids (39.6), and that of the female skull of Grave No. 59 tends towards it (43.9). The majority of values of females and also the average are close to the mean value of Europoid and Mongoloid group averages. The males are of Europoid character. Simotical index (IS) values of males are similar to those of Europoids. The value obtained on the female skull of Grave No. 46 is even lower than the average of Mongoloids (28.6), what comes from the low value of simotical subtense (2.0). Otherwise the females occupy a position between Europoids and Mongoloids. Nasalspine angle (Martin 75_1) averages of males and females are both similar to those of Europoids. On 1 female skull (Grave No. 92) and on 3 male skulls (Grave Nos. 94, 98, 111) I found data similar to the mean value of Europoids' and Mongoloids' group averages. Index of incisure maxillo-malare (IMMS: IMMC) can be calculated from the length and depth of maxillo-malare (TÓTH 1962). It is a well-known fact that Mongoloids are characterized by longer and shallower dimensions. In our cemetery the averages of males as well as those of females reflect a Europoid character. However, I have data approaching those of Mongoloids on 4 male skulls (Grave Nos. 25, 49, 98, 111) and on 3 female skulls (Grave Nos. 46, 59, 79). Index of malar arc (S: C) examinations supplement the evaluation of primary taxonomical characteristics and the demonstration of Europoid and Mongoloid influences (TÓTH 1964, 1968). In our series the averages of males and females are both closely resembling the mean values of the averages of Europoids and Mongoloids. I have observed Mongoloid influence on the male skulls of Grave Nos. 20, 94, 98 and 117, but the values of the other primary taxonomical characteristics do not support it. The female skulls of Grave Nos. 73, 90, 92, 112 and 115 present Mongoloid characteristics, but here too no confirmation could be obtained. Fossa canina's depth analysis results are unsuitable for race diagnostical determinations, however, it can supply useful data to achieve a more complete image of individuals and the cemetery as a whole (TÓTH 1967). Fossa canina is of medium depth at both sexes according to the mean values, but this results from a wide range of varieties. This range is made up of values from the very shallow 1.0 of the male skull of Grave No. 27 and of the female skull of Grave No. 112 to the very deep ones of the male skulls of Grave No. 107 (7.8) and the female skull of Grave No. 80 (6.7). Facial flatness index (IC) value (-2.9) also confirms the cemetery's Europoid character.

According to my results the Avar Period cemetery of Solymár is of Europoid character. However the two sexes show some differences. Almost no Mongoloid influence can be registered with the males: I have observed values similar to those of Europo-Mongoloids only in some cases of individual characteristics. Mongoloid components are clearly present on the female skulls of Grave Nos. 46, 59, and 119 in no less than 3 characteristics. The averages of females are also often close to those of Europo-Mongoloids.

2. Analysis of secondary taxonomical characteristics

I have executed morphotaxonomical examinations on 30 skulls, of 19 males and 11 females. I took into consideration the stature values calculated by the method of BREITINGER (1938) and BACH (1965) (Table 10). I pass over the characterization of taxa as these can be found in two editions of the university handbook of LIPTÁK (1969, 1980).

The ratio of Cromagnoids is the greatest, 33.3%, within the Europoid great race; altogether 10 individuals (8 males and 2 females). The males of Grave Nos. 49, 98 and the females of Grave No. 80 carry crA characteristics. These characteristics are mixed with an undetermined group on 4 male skulls (Grave Nos. 71, 89, 107, 117) (crA-x). The Brachycran skulled male individual of Grave No. 67 bears the characteristics of race crB. These occur mixed with other features on the male skull of Grave No. 94 and on the female skull of Grave No. 115 (crB-x).

The Mediterranean group is represented by 6 males and 1 female. Gracile Mediterranean type (m) characteristics can be clearly identified on 3 males (Grave Nos. 27, 96, 130) and these characteristics can be seen mixed with unidentified elements on the female skull of Grave No. 92 (m-x). The Atlanto-Mediterranean type is represented by the male of Grave No. 78 (am) and by the male of Grave No. 114 (am-x). The features of the Eastern-Mediterranean type occur mixed with other features (i-x) on the male skull of Grave No. 111.

The number of individuals belonging to the Brachycran group is low, only 3 males. The male of Grave No. 65 carries the characteristics of the Pamirian race (p), the male of Grave No. 20 bears those of the Dinarian (d) race. Dinarian characteristics are combined with other features on the skull of Grave No. 43 (d-x).

There are surprisingly few Nordoid skulls within our series, in spite of the great number of Dolicho- and Hyperdolichocrans. However, dolichocephaly is coupled, with low or wide faces - especially in the females. We can find Nordoid features on the male skull of Grave No. 25 within the Europids (n). The male skull of Grave No. 102 and the female skull of Grave No. 82 also present a similar characteristic, but their Chamaecran character is so strongly marked that the two should be classified into a separate group (cham-eur).

Type analysis of females was more difficult than usual. As I pointed it out at the analysis of primary taxonomical characteristics, Mongoloid and Europo-Mongoloid features occur on some skulls. Because of it I found it necessary to establish a Europo-Mongoloid group within the Table. On the female skull of Grave No. 46 the features of the Saianic type can be seen beside the Europid features (eu-sa), (otherwise chamaecranic, mesocranic). The characteristics of the Sinid race are mingled with Europid features (eu-si) on the female skull of Grave No. 79. Mongoloid influence can be seen beside typical Nordoid features on the female skull No. 125 (n-x/moid). In three cases (Graves Nos. 59, 73, 112) Gracile Mediterranean race characteristics are implanted by Mongoloid features (m/moid). One of these (Grave No. 59) is Hyperchamaecranic. Several Europid types are present mingled with Mongoloid influence on the female skull of Grave No. 119 (eu-moid).

Summing up the above it can be stated that the anthropological material of the Avar Period cemetery of Solymár is of Europid character in the overwhelming majority of cases. However, Mongoloid influence is detected in 63.6% (7 individuals) of the females analysed. The sequence of main race components relating the cemetery as a whole reflects the anthropological characteristics of males. Cromagnoids are present in the largest number, they are followed by Mediterraneans and Brachycrans. On this basis our series is heterogeneous.

COMPARATIVE ANALYSIS

I have drawn 13 Avar Period series into the comparative analysis carried out by several methods. The selection of series was principally dictated by their geographic locations. These cemeteries were used between the 6th and 8th centuries. Not all the series could be analysed by all methods because of the lack of data and the lack of the necessary number of cases.

COMPARATIVE TAXONOMICAL ANALYSIS

Our cemetery is not a typical Avar Period cemetery according to the frequency sequence of the main secondary race components, as the typical series are characterized by the majority of Brachycrans followed by Nordoids, by Cromagnoids and by Mediterraneans at the end (LIPTÁK & VÁMOS 1969).

Only the early Avar series of Környe (TÓTH 1971) indicate similarity to our series from all the series compared, because in that series Cromagnoids make up the majority and the Mediterraneans are in the second place. From other aspects (namely the presence of Roman-Germanic elements) the series of Környe is also differing from the series of Solymár. The other cemeteries are characterized by Brachycrans and Nordoids constrasting with the Avar Period population of Solymár.

Though it is not contained in the group of comparative series, the 8th century Avar Period cemetery of Szebény (TÓTH 1961) also presents a similar anthropological image on the basis of the frequency sequence of taxa which occur in it. Anyway, the females of Solymár which are so close Europo-Mongoloids increase the difference from this cemetery too.

PENROSE's METHOD

The "generalized PENROSE-distance" (D^2_P) - obtained by the joint evaluation of 12 measurements - indicates the individual distances of each series taken into comparison from our cemetery (PENROSE 1954) (Table 11).

The males of Csákberény (2.43) and Vác-Kavicsbánya (2.66) come closest to the males of Solymár. The male series of Előszállás (4.23) and Váchartyán (4.85) are still relatively close. The males of Tiszavasvár (8.87) are the farthest from the males of Solymár.

The same two cemeteries which are closest to the males of Solymár take this place as compared to the females of Solymár, with the difference that the distance of Vác-Kavicsbánya is very small (1.45) while the distance of Csákberény is somewhat larger (3.93). The largest distances are presented by the females of Üllő 1 (10.39) and of Tiszavasvár (10.04). On the basis of this method the male and female series of Solymár show difference and similarity almost to the same series.

TOPOGRAPHICAL REPRESENTATION OF ABSOLUTE MEASUREMENTS

I analysed the interrelations of three absolute measurements (MARTIN 8, 45, 48) and three indices (8:1, 52:51, 54:55) drawing in 13 comparative series (Figs. 1-10).

The males present the most marked resemblance to the male series of Váchartyán, Vác-Kavicsbánya and Előszállás-Bajcsihegy. As far as the relation of the width of the zygomatic arc and the height of the upper face is concerned the males of Környe are still relatively close. The male populations of the cemeteries Budapest-Népstadion and Tiszavasvár show the least similarity.

The females of Solymár indicate similarity to the female series of Budapest-környéke and Csepel-szabadkikötő - which are rather close geographically to Solymár. The females of Vác-Kavicsbánya are also relatively similar, but to a lesser extent than the males are. The female series of Tiszavasvár and Budapest-Népstadion bear the least resemblance to the females of Solymár, just as in the case of males.

THE SPECIAL INDICES OF ALEXEYEVA

11 Avar Period cemeteries were taken under examination (Table 12).

The males of Solymár present the strongest similarity to the males of Környe and Szekszárd-Palánkpuszta on the basis of the correlation of skull height-breadth-length and of the upper face-skull height. The male population of Vác-Kavicsbánya is less similar. The lowest degree of similarity can be found with series of Alattyán-Tulát and Budapest-környéke (Fig. 11). As far as the females are concerned, none of the cemeteries presents a large

scale resemblance. The degree of similarity is almost equal with the female series of Környe, Szekszárd-Palánk and Vác-Kavicsbánya (Fig. 13).

On the basis of the relations of cranial height-orbital height and of nasal breadth-facial breadth the male series displays the greatest similarity to those of Tiszavasvár and Üllő I. The male series of Budapest-környéke and Csákberény present the greatest difference from this aspect (Fig. 12). In the case of the female series of the cemeteries Tiszavasvár and Vác-Kavicsbánya are similar to that of Solymár. All the other female series are far from it (Fig. 14).

Summarizing the results of the analysis executed by ALEXEYEVA's special indices we can see that males and females alike present similarity to the populations of Környe, Szekszárd-Palánk and Tiszavasvár. The anthropological material of Vác-Kavicsbánya is still relatively close to that of Solymár. The greatest differences could be found in the populations of Alattyán-Tulát, Budapest-környéke, Csákberény.

COMPARISON OF FACIAL FLATNESS MEASUREMENTS

I managed to apply the averages calculated for Europoids, Mongoloids, 7th-8th century Avars (TOTH 1958) and for Conquering Hungarians (TÓTH 1965) beside the averages calculated from the data of 10 Avar Period cemeteries (TÓTH 1970) (Tables 13, 14, Figs 15-26).

The males of Solymár indicate the greatest similarity with those of Környe and Csákberény, at the same time they approach the average of Europoids quite closely. From certain aspects they also indicate proximity to the average of Avars. The series of Váchartyán and Csepel are the most different.

The female series shows the most marked resemblance to those of Alattyán-Tulát and Váchartyán. From a number of aspects the female population of Környe is also close to that of Solymár. The females of Budapest-környéke and Csepel-szabadkikötő are different. Females are more markedly different from the average of Europoids than males are, except for the relation of NM-ZM angle. On the other hand females resemble the Avars more so than males do. Both sexes are quite far from the average of the Conquering Hungarians. Because of its Europid character the cemetery differs to the greatest extent from Mongoloids. This supports the fact that the Mongoloid influence observed on the females of Solymár is rather limited.

PFC AND FACIAL FLATNESS INDEX

The value of the praeauricular facio-cerebral index (PFC) is 38.7 in our cemetery, what is closely resembling that of the Europoids, more closely the bulkier and wider face type characteristic for the Northern territories (89.9) (TÓTH 1974). From the comparative series those of Környe and Vác-Kavicsbánya are the closest to ours (Table 15).

The relationship of PFC and facial flatness index (IC) is presented in Figure 27. I have also considered the PFC and IC averages of Europoids, Europo-Mongoloids, Mongoloids (DEBETS 1961) and those of the Conquering Hungarians (DEBETS 1964, TÓTH 1965, 1969). Our material resembles the cemeteries of Környe and Vác-Kavicsbánya the most.

SUMMARY

As a conclusion of the comparisons carried out by various methods it can be stated that the male series of the Avar Period cemetery of Solymár is the most similar to the male group of Környe, Csákberény and Vác-Kavicsbánya. According to ALEXEYEVA's indices the male populations of Tiszavasvár and Szekszárd-Palánk are of a very similar character too, but no other method indicates it, what is more, the series of Tiszavasvár is the most distant one according to more than one other method. The geographically nearby series of Budapest-környéke, Budapest-Népstadion and Csepel-szabadkikötő are also different from the series of Solymár.

The females present the most marked similarity to the female series of Vác-Kavicsbánya by some methods, however, taking method by method, the different cemeteries produce

the highest degree of resemblance. These are the following: Budapest-környéke, Környe, Tiszavasvár and Alattyán-Tulát. According to the correlation of absolute measurements the series of Budapest-környéke and Csepel-szabadkikötő, which are geographically also the nearest ones, are the most similar to the series of Solymár, but other methods do not support this fact. The comparison of the female series had not carried an unanimous result. This is partly an outcome of the heterogeneous anthropological character of the females of Solymár.

The males are presenting a more homogeneous image than the females, as their ancestors have probably married the women of several populations of different types. This happened partially in the process of the westward migration of generations following each other, partially as a result of meeting the autochthon population found in the Carpathian Basin. The difference from the population of the surrounding contemporary settlements indicates, on one hand, the fact that they must have migrated separately and on the other, that the extent and pace of amalgamation with the neighbouring peoples must have been limited and rather slow.

REFERENCES

ALEXEYEVA, T.I. (1966): Die Slawen und ihre Nachbarn (Nach anthropologischen Daten). - Anthropologie (Praha) 4: 3-37.

ALEXEYEV, V.P. - DEBETS, G.F. (1964): Kraniometria. Metodika anthropologitsheskih isledovaniy. - Izd. Nauka, Moskva: 128 pp.

BACH, H. (1965): Zur Berechnung der Körperhöhe aus den langen Gliedmassenknochen weiblicher Skelette. - Anthrop. Anz., 29: 12-21.

BÁTAI, E. (1952): A váchartyáni avar temető csontvázleleteinek embertani vizsgálata (Le cimetere avar de Váchartyán). - Annls hist.-nat. Mus. natn. hung. 2: 213-224.

BOTTYÁN, O. (1966): Data to the Anthropology of the Avar Period Population of Budapest. - Anthrop. hung. 7: 3-33.

BREITINGER, E. (1938): Zur Berechnung der Körperhöhe aus den langen Gliedmassenknochen. - Anthrop. Anz. 14: 249-274.

DEBETS, G.F. (1961): O nekotorih naprevleniyah izmeneniy v stroenii tsheloveka sovremennogo vida. - Sov. Etnogr. 2: 9-23.

DEBETS, G.F. (1964): Ob anthropologitsheskom type drevnego naselenia Finlandii. - Sovr. Anthr. Moskva: 233-239.

ÉRY, K. (1966): The osteological data of the 9th century population of Ártánd. - Anthrop. hung. 7: 85-114.

ÉRY, K. (1967): An anthropological study of the late avar period population of Ártánd. - Annls hist.-nat. Mus. natn. hung. 59: 465-484.

FERENCZ, M. (1980-1981): Some data to the palaeoanthropology of the Avar Period's population in Hungary. - Anthrop. hung. 17: 23-64.

FERENCZ, M.: A Csepel-szabadkikötő avar-kori sorozat antropológiai feldolgozása [The anthropological examination of the avar age series of Csepel-szabadkikötő].- (Manuscript, in Hungarian).

FARKAS, Gy. (1972): Antropológiai praktikum I. [Anthropological practice I]. - Szeged: 28-66 (Manuscript, in Hungarian).

LIPTÁK, P. (1954): A tipusok eloszlása Kiskunfélegyháza környékének XII. századi népességében (Répartition des types anthropologiques de la population des environs de Kiskunfélegyháza du XII^{e} siècle). - Biol. Közl. 1: 105-120.

LIPTÁK, P. (1955): Recherches anthropologiques sur les ossements avares des environs d'Üllő. - Acta arch. hung. 6: 231-316.

LIPTÁK, P. (1963a): Historisch-anthropologische Auswertung der im awarenzeitlichen Gräberfeld von Alattyán erschlossenen Skelettreste (In: KOVRIG, I. Das awarenzeitliche Gräberfeld von Alattyán). Arch. hung. 40: 245-258.
LIPTÁK, P. (1963b): Budapest avarkori népességének antropológiája I (Anthropologie der awarenzeitlichen Bevölkerung von Budapest I). - Budapest Régiségei 20: 327-334.
LIPTÁK, P. (1965): On the Taxonomie Method in Palaeoanthropology (Historical Anthropology) - Acta biol. 11: 169-183.
LIPTÁK, P. (1969): Embertan és emberszármazástan [Anthropology and geneology]. - Tankönyvkiadó, Budapest (in Hungarian).
LIPTÁK, P. (1974): Anthropological analysis of the avar-period population of Szekszárd-Palánkpuszta. - Acta biol. 20: 199-211.
LIPTÁK, P. (1980): Embertan és emberszármazástan Anthropology and geneology . - Tankönyvkiadó, Budapest (in Hungarian).
LIPTÁK, P. & VÁMOS, K. (1969): A "Fehértó-A" megnevezésü avar-kori temető csontváz-anyagának embertani vizsgálata (Anthropologische Untersuchung des Skelettmaterials des awarenzeitlichen Gräberfeldes von "Fehértó-A"). - Anthrop. Közl. 13: 3-30.
MANOUVRIER, L. (1892): Determination de la teille d'apres les grands os des membres. - Rev. Mem. de l'École d'Anthrop. 2: 227-233.
MARTIN, R. (1928): Lehrbuch der Anthropologie II. - Jena: 579-1182.
MARTIN, R. & SALLER, K. (1957): Lehrbuch der Anthropologie. Bd. I. - Stuttgart: 440-597.
MOLLISON, Th. (1938): Spezielle Methoden Anthropologischen Messungen (in: ABDERHALDEN, E.: Handbuch der biologischen Arbeitsmethoden. VII. 2-3). - Berlin: 523-628.
PENROSE, L. S. (1954): Distance, Size and Shape. - Annals of Eugenics 18: 337-343.
TAJTI, Zs. & TÓTH, T. (1976-1977): Adatok Délkelet-Dunántul avarkori népességének embertanához. - Anthrop. hung., 15: 5-124 (in Hungarian).
TÓTH, T. (1958): Profilation horizontale du crâne facial de la population ancienne et contemporaine de la Hongrie. - Crania hung. 3: 3-126.
TÓTH, T. (1961): Mogilnik I. avarskogo vremeni s Szebeny (VIII. v.). (Paleoanthropologitsheskiy otsherk). - Annls hist.-nat. Mus. natn. hung. 53: 571-613.
TÓTH, T. (1962): Le cimetière de Csákberény provenant des débuts de l'époque avare (VI^{e} et VII^{e} siècles). Esquisse paléoanthropologique. - Annls hist.-nat. Mus. natn. hung. 54: 521-549.
TÓTH, T. (1964): The german cemetery of Hegykő (VIth c.). - Annls hist.-nat. Mus. natn. hung. 56: 529-558.
TÓTH, T. (1965): A honfoglaló magyarság ethnogenezisének problémája (Problèmes de l'ethnogenèse des hongrois conquérants). - Anthrop. Közl. 9: 139-149.
TÓTH, T. (1967): On the diagnostic significance of morphological characters I. (A methodological study). - Annls hist.-nat. Mus. natn. hung. 59: 443-454.
TÓTH, T. (1968): On the diagnostic significance of morphological characters II. (A methodological study). - Annls hist.-nat. Mus. natn. hung. 60: 293-296.
TÓTH, T. (1969): On the diagnostic significance of morphological characters III. (A methodological study). - Annls hist.-nat. Mus. natn. hung. 61: 401-412.
TÓTH, T. (1970): Ob utshelnom vese mongoloidnüh elementov v naseleniy Avarskogo Kaganata (in: TÓTH, T. & FIRSHTEIN, B. V.: Anthropologitsheskie dannie k voprosu o velikom pereseleniy narodov Avari i Sarmati). - Izd. Nauka., Leningrad: 5-68.
TÓTH, T. (1971): The cemetery of Környe (6th-7th c.). (in: SALAMON, Á. & ERDÉLYI, I.: Das völkerwanderungszeitliche Gräberfeld von Környe). - Studia Arch., V. Akadémiai Kiadó, Budapest: 153-184.
TÓTH, T. (1973): On the morphological modification of anthropological series in the Central Danubian Basin. - Annls hist.-nat. Mus. natn. hung. 65: 323-350.
TÓTH, T. (1974): Somatologia i paleoanthropologia naselenia Vengrii. - Doct. dissertation. 277-279 (in Russian).
WENGER, S. (1952): Contributions á l'anthropologie des avars en Hongrie (le cimetière d'Alattyán-Tulát). - Annls hist.-nat. Mus. natn. hung. 2: 205-212.

WENGER, S. (1957): Données ostéométriques sur le matériel anthropologique du cimetière d'Alattyán-Tulát, provenant de l'époque avare. - Crania hung. 2: 1-55.
WENGER, S. (1966): Anthropologie de la population d'Előszállás-Bajcsihegy provenant des temps avars. - Anthrop. hung. 7: 115-206.
WENGER, S. (1967): Adatok az avarkor népességének antropológiájához (Data to the anthropology of the population in the Avar-age). - Anthrop. Közl. 11: 199-215.
WENGER, S. (1972): Anthropological examination of the osteological material deriving from the Avar period cemetery at Tiszavasvár (Hungary). - Anthrop. hung., 11: 5-81.
WENGER, S. (1974): Anatómiai variációk magyarországi paleoantropológiai leleteken (Anatomical variations in some palaeoanthropological finds from Hungary). - Anthrop. Közl. 18: 229-233.

Author's address: DR. MÁRTA FERENCZ

Anthropological Department
Hungarian Natural History Museum
Budapest, Bajza utca 39.
H-1062

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	-	-	18	18	14.2
	Infans II	-	-	8	8	6.3
	Juvenis	-	-	8	8	6.3
	Adultus	16	24	-	40	31.5
	Maturus	24	10	1	35	27.5
	Undeterminable	-	-	1	1	0.8
	Total:	40	34	36	110	86.6
Cranium only	Infans I	-	-	4	4	3.1
	Infans II	-	-	-	-	-
	Juvenis	-	-	-	-	-
	Adultus	1	-	-	1	0.8
	Maturus	-	-	-	-	-
	Undeterminable	-	-	-	-	-
	Total:	1	-	4	5	3.9
Postcranial skeleton	Infans I	-	-	3	3	2.4
	Infans II	-	-	1	1	0.8
	Juvenis	-	-	-	-	-
	Adultus	-	3	-	3	2.4
	Maturus	-	1	1	2	1.5
	Undeterminable	-	-	3	3	2.4
	Total:	-	4	8	12	9.5
Total		41 (32.3%)	38 (29.9%)	48 (37.8%)	127	

Table 2 Distribution of crania

Age groups	Measurable		Unmeasurable			Total	
	Male	Female	Male	Female	Undet.	N	%
Infans I	-	-	-	-	22	22	19.1
Infans II	-	-	-	-	8	8	7.0
Juvenis	-	-	-	-	8	8	7.0
Adultus	9	9	8	15	-	41	35.6
Maturus	11	3	13	7	1	35	30.4
Senium	-	-	-	-	-	-	-
Undeterminable	-	-	-	-	1	1	0.9
Total	20 (17.4%)	12 (10.4%)	21 (18.3%)	22 (19.1%)	40 (34.8%)	115	

Table 3 Parameters of male and female series

MARTIN No.	Males				MARTIN No.	Females			
	N	V	M	s		N	V	M	s
1	20	172-195	182.60	6.66	1	12	166-187	175.33	5.68
1c	20	173-197	179.35	6.01	1c	12	165-184	174.08	5.63
5	17	84-109	101.82	6.92	5	10	92-102	96.10	3.21
8	20	133-147	139.05	4.48	8	12	126-145	134.42	4.60
9	20	88-105	97.25	4.30	9	12	90- 98	94.00	2.45
10	20	110-132	120.15	5.36	10	12	107-122	115.42	4.10
17	18	119-144	133.72	5.56	17	10	121-133	127.30	3.95
20	16	109-119	113.13	2.92	20	12	101-113	107.83	3.39
32	15	74- 87	79.47	5.11	32	12	76- 87	81.75	3.96
32-	15	66- 84	74.33	6.65	32-	12	70- 84	77.17	4.26
40	18	84-107	94.72	7.24	40	10	85-102	92.50	6.72
43	19	97-112	104.68	4.39	43	12	96-104	99.83	2.53
45	11	123-137	131.36	5.03	45	7	115-133	122.00	5.94
46	17	81-103	94.71	6.16	46	12	85- 98	92.17	4.28
47	16	108-134	119.63	7.14	47	10	100-122	110.80	8.08
48	19	59- 78	68.37	4.80	48	11	55- 69	63.36	4.39
50	16	16- 27	21.19	2.90	50	12	17- 23	20.25	1.87
51	17	39- 45	41.53	1.59	51	12	39- 43	40.50	1.32
51a	17	36- 42	38.88	1.81	51a	11	36- 40	37.82	1.20
52	18	29- 36	33.63	1.67	52	12	30- 37	32.67	2.11
54	18	22- 29	25.17	1.51	54	12	23- 28	25.08	1.62
55	18	42- 57	52.00	3.46	55	12	45- 58	49.58	3.81
62	15	40- 52	46.00	3.51	62	11	40- 50	43.63	3.18
63	19	35- 46	39.95	3.02	63	11	36- 43	38.27	2.41
65	13	106-125	118.85	5.85	65	9	100-123	109.89	7.05
66	18	93-116	104.22	7.02	66	8	87-104	92.75	5.56
69	20	23- 38	29.35	3.73	69	11	21- 33	26.00	3.82
70	19	56- 76	62.63	5.76	70	11	45- 65	56.27	5.80
71a	20	26- 36	31.50	2.57	71a	11	27- 32	29.72	1.75
72	15	80- 89	84.07	2.46	72	12	75- 92	82.83	5.64
73	15	78- 90	82.87	3.30	73	12	76- 89	82.42	4.98
74	14	79- 92	84.43	3.61	74	12	72- 93	81.08	6.79
75	6	30- 59	49.50	10.99	75	6	44- 62	52.33	5.86
75/1	6	26- 50	34.00	9.03	75/1	6	25- 32	29.00	2.61
8:1	20	68.7 - 84.0	76.60	7.98	8:1	12	72.8 - 83.1	76.86	6.06
17:1	18	67.4 - 79.1	73.83	7.28	17:1	10	65.8 - 77.1	73.00	7.06
17:8	18	80.9 -105.1	96.61	10.41	17:8	10	84.8 -100.0	94.30	9.14
9:8	20	50.5 - 76.9	69.10	10.48	9:8	12	64.1 - 74.6	70.08	5.84
47:45	10	80.6 -102.4	90.00	14.62	47:45	7	77.4 - 98.4	90.43	14.73
48:45	11	44.0 - 58.7	51.77	9.25	48:45	7	45.1 - 56.1	52.29	7.46
52:51	17	72.5 - 92.3	81.44	9.27	52:51	12	76.2 - 90.2	80.83	8.65
54:55	17	40.7 - 59.5	48.50	9.05	54:55	12	39.7 - 57.8	51.33	11.44
63:62	15	75.5 - 97.9	86.37	12.72	63:62	10	74.0 -107.5	88.50	20.44
Stature acc. to MANOUVRIER	16	154.2 -173.6	162.31	4.88	Stature acc. to MANOUVRIER	9	142.1 -159.9	151.11	5.40
Stature acc. to BREITINGER	17	157.6 -175.3	166.59	4.09	Stature acc. to BACH	9	150.5 -166.4	158.00	4.58

Table 4 Distribution of morphological characteristics

Characteristics		Male		Female		Total	
		N	%	N	%	N	%
Norma verticalis	Ovoid	1	5.0	1	8.3	2	6.3
	Pentagonoid	7	35.0	8	66.7	15	46.8
	Sphenoid	12	60.0	3	25.0	15	46.8
	Total:	20		12		32	
Glabella	Broca 1	-	-	15	60.0	15	25.9
	Broca 2	3	9.1	9	36.0	12	20.7
	Broca 3	10	30.3	1	4.0	11	18.9
	Broca 4	6	18.2	-	-	6	10.3
	Broca 5	11	33.3	-	-	11	18.9
	Broca 6	3	9.1	-	-	3	5.2
	Total:	33		25		58	
Arcus superciliaris	Broca 1	-	-	20	80.0	20	34.5
	Broca 2	12	36.4	5	20.0	17	29.3
	Broca 3	21	63.6	-	-	21	36.2
	Total:	33		25		58	
Protuberantia occipitalis externa	Broca 0	-	-	12	57.1	12	22.6
	Broca 1	4	12.5	8	38.1	12	22.6
	Broca 2	14	43.8	1	4.8	15	28.3
	Broca 3	8	25.0	-	-	8	15.1
	Broca 4	4	12.5	-	-	4	7.5
	Broca 5	2	6.2	-	-	2	3.8
	Total:	32		21		53	
Processus mastoideus	Harsányi -2	2	5.4	15	51.7	17	25.8
	Harsányi -1	8	21.6	11	37.9	19	28.8
	Harsányi 0	13	35.1	2	6.9	15	22.7
	Harsányi +1	11	29.7	1	3.4	12	18.2
	Harsányi +2	3	8.1	-	-	3	4.5
	Total:	37		29		66	
Nasal aperture	Sulc. praenas.	16	72.7	8	61.5	24	68.6
	Fossa praenas.	3	13.6	2	15.4	5	14.3
	Anthropine	3	13.6	3	23.1	6	17.1
	Total:	22		13		35	
Spina nasalis anterior	Broca 1	-	-	-	-	-	-
	Broca 2	3	21.4	1	33.3	4	23.5
	Broca 3	6	42.9	2	66.7	8	47.1
	Broca 4	2	14.3	-	-	2	11.8
	Broca 5	3	21.4	-	-	3	17.6
	Total:	14		3		17	
Fossa canina	Very small (1)	3	13.6	4	30.7	7	20.0
	Small (2)	5	22.7	4	30.7	9	25.7
	Medium (3)	5	22.7	1	7.7	6	17.1
	Large (4)	5	22.7	1	7.7	6	17.1
	Very large (5)	4	18.2	3	23.1	7	20.0
	Total:	22		13		35	
Alveolar prognathy	Vertical (1)	3	14.3	3	25.0	6	18.2
	Moderate (2)	13	61.9	2	16.7	15	45.4
	Expressed (3)	5	23.8	7	58.3	12	36.4
	Total:	21		12		33	
Teeth wear	Körber 1	2	5.9	10	40.0	12	20.3
	Körber 2	15	44.1	9	36.0	24	40.7
	Körber 3	11	32.4	5	20.0	16	27.1
	Körber 4	6	17.6	1	4.0	7	11.9
	Körber 5	-	-	-	-	-	-
	Total:	34		25		59	

Table 5

Individual measurements and indices of males

Grave No / MARTIN No	20 Ad	25 Mat	27 Mat	30 Ad	43 Mat	49 Mat	65 Ad	67 Ad	71 Ad	78 Ad	89 Ad	94 Mat	96 Mat	98 Mat	102 Ad	107 Mat	111 Mat	114 Ad	117 Mat	130 Mat
1	174	195	183	178	172	188	175	175	183	188	184	177	178	180	195	182	184	185	184	191
1c	173	197	184	175	175	180	177	176	177	180	174	180	178	173	187	175	178	179	178	191
5	84	100	104	-	96	107	92	99	-	106	109	100	98	108	106	107	108	109	-	98
8	140	134	137	134	139	140	147	141	139	137	133	144	135	137	147	145	135	137	145	135
9	95	103	97	87	93	95	102	105	99	95	95	103	88	95	103	98	94	100	97	93
10	121	125	122	123	118	110	128	127	113	117	116	132	118	114	126	118	116	122	120	119
17	133	136	131	-	136	131	119	132	135	144	124	139	134	134	137	134	134	140	-	134
20	113	113	"	"	114	113	"	111	109	116	"	119	110	111	117	113	112	117	108	113
32	80	85	"	"	87	76	"	87	74	75	-	86	82	74	78	74	74	-	77	83
32-	77	82	-	"	84	87	-	83	70	69	"	81	77	67	72	67	66	-	72	81
40	84	94	98	-	89	107	85	90	96	94	103	93	86	100	97	101	103	103	-	84
43	98	105	102	"	100	104	103	106	107	101	105	111	97	112	110	107	108	109	105	99
45	127	133	-	"	126	134	"	131	-	"	"	136	126	136	-	137	-	"	136	123
46	89	93	87	"	85	81	"	94	93	101	97	103	92	103	97	100	85	"	102	88
47	130	134	"	"	113	108	116	109	-	124	117	122	118	117	128	116	124	119	119	-
48	74	78	65	72	62	59	66	64	"	72	66	68	70	65	74	73	72	67	66	66
50	18	22	23	-	20	19	23	23	25	18	-	27	16	21	-	21	24	"	20	18
51	40	42	40	"	40	43	43	41	41	43	-	40	38	45	42	43	42	-	42	40
51a	37	37	36	"	37	41	40	39	39	40	"	37	37	42	40	41	40	-	40	38
52	34	35	29	"	32	32	35	33	33	33	33	33	36	35	35	36	33	"	33	34
54	22	25	25	24	26	25	25	26	27	25	-	25	-	25	29	24	26	25	26	23
55	54	57	48	51	52	42	55	52	-	55	-	51	54	54	55	54	52	49	49	52
62	44	49	46	52	45	49	42	43	"	47	-	49	41	47	"	50	46	-	-	40
63	37	37	40	42	35	42	40	40	40	46	43	41	36	43	-	38	38	41	44	36
65	113	125	-	122	112	"	106	117	-	123	-	124	115	124	119	123	122	-	"	-
66	108	115	95	108	102	101	94	104	116	114	103	104	106	112	102	102	"	97	-	93
69	33	38	26	32	26	27	28	23	29	32	29	36	30	26	27	29	33	30	27	26
70	64	71	58	60	56	76	63	57	57	65	57	73	57	64	60	65	-	63	65	59
71a	26	31	34	30	31	34	27	31	31	28	31	33	29	34	33	36	32	34	32	33
72	82	83	"	"	83	80	-	86	83	86	-	85	84	85	89	83	85	-	80	87
73	78	82	"	-	81	79	"	85	84	87	-	84	83	82	90	80	86	-	79	83
74	88	82	"	"	88	85	"	85	79	83	"	87	83	92	80	85	85	"	80	"
75	"	"	"	"	45	30	-	"	"	"	-	57	"	57	-	49	59	-	"	-
75/1	"	"	-	"	38	50	-	"	-	"	-	28	-	28	"	34	26	-	"	"
8:1	80.5	88.7	74.8	75.3	80.8	74.1	84.0	80.8	78.0	72.9	72.3	81.4	75.8	76.1	75.4	79.7	73.4	74.1	78.8	70.7
17:1	76.4	69.7	71.8	"	79.1	69.3	68.0	75.4	73.8	76.6	67.4	78.5	75.3	77.4	70.3	73.6	72.8	75.7	-	70.2
17:8	95.0	101.5	95.6	"	97.8	93.6	80.9	93.6	97.1	105.1	93.2	96.5	89/3	97.8	93.2	92.4	99.3	102.2	"	99.3
9:8	67.9	78.9	70.8	72.4	66.9	67.9	69.4	74.5	71.2	50.5	71.4	71.5	65.2	69.3	70.1	66.2	69.6	73.0	66.9	68.9
47:45	102.4	100.8	"	"	89.7	80.6	"	83.2	"	"	-	89.7	93.7	86.0	"	84.7	"	"	87.5	"
48:45	58.3	58.7	"	-	49.2	44.0	-	48.9	-	"	-	50.0	55.6	47.8	"	53.3	-	-	48.5	63.7
52:51	85.0	83.3	72.5	"	80.0	74.4	81.4	80.5	80.5	76.7	"	82.5	92.3	77.8	83.3	83.7	78.6	-	78.6	85.0
54:55	40.7	43.8	52.1	47.1	50.0	59.5	45.5	50.0	-	45.5	-	49.0	"	46.3	52.7	44.4	50.0	51.0	53.1	44.2
63:62	84.1	75.5	87.0	80.8	77.8	85.7	95.2	93.0	-	97.9	-	83.7	87.8	91.5	-	78.0	82.6	"	"	90.0

Table 6

Individual measurements and indices of females

Grave No / MARTIN No	46 Mat	59 Ad	73 Ad	78 Ad	80 Mat	82 Ad	90 Mat	92 Ad	112 Ad	115 Ad	119 Ad	125 Ad
1	175	187	173	169	178	177	175	180	178	166	169	179
1c	173	184	175	168	181	172	172	177	176	165	168	178
5	97	98	-	92	94	93	98	102	-	95	93	99
8	136	145	126	136	131	133	137	133	133	138	132	133
9	96	93	94	95	90	98	93	97	90	94	93	95
10	115	118	110	116	116	122	117	118	107	115	112	119
17	123	123	-	130	128	121	128	133	-	128	127	132
20	104	110	101	109	107	106	112	113	107	106	109	110
32	78	79	87	81	87	78	87	79	76	81	85	83
32-	74	75	84	78	83	73	78	74	70	76	81	80
40	-	101	93	86	86	102	85	92	-	92	87	101
43	100	100	98	98	96	103	99	103	97	104	98	101
45	-	-	115	122	116	123	"	121	"	133	124	"
46	90	98	96	92	86	98	90	85	90	92	98	93
47	"	122	110	120	100	118	"	109	100	103	110	116
48	-	69	62	68	59	69	64	62	55	60	65	64
50	21	21	22	20	19	18	17	23	23	19	20	20
51	41	41	39	40	38	41	41	42	39	43	39	41
51a	39	39	37	38	37	38	38	40	37	-	37	39
52	32	37	30	33	30	34	35	32	31	33	31	34
54	23	27	26	25	26	23	24	23	28	25	25	28
55	58	49	46	54	47	49	51	47	45	47	53	49
62	40	47	45	-	41	50	40	44	45	42	41	45
63	39	37	38	36	38	37	43	36	37	41	-	41
65	107	"	100	115	108	110	"	"	102	115	109	123
66	-	95	-	89	"	87	"	94	87	94	92	104
69	26	27	30	33	21	30	"	23	24	23	22	27
70	62	60	54	58	53	65	"	57	45	60	49	58
71a	31	30	31	28	27	31	"	27	31	32	28	30
72	90	80	82	86	81	77	92	87	75	82	87	75
73	88	80	83	87	79	77	89	87	76	80	87	78
74	91	77	77	83	81	72	93	85	75	84	83	72
75	-	-	52	54	52	50	"	62	44	"	"	"
75/1	"	"	30	32	29	27	"	25	31	"	"	"
8:1	77.1	77.5	72.8	80.5	74.4	75.1	78.9	73.9	74.7	83.1	78.1	74.3
17:1	70.3	65.8	"	76.9	73.7	68.4	73.1	73.9	"	77.1	75.2	73.7
17:8	90.4	84.8	"	95.6	97.7	91.0	93.4	100.0	"	92.8	96.2	99.3
9:8	70.6	64.1	74.6	69.9	68.7	73.7	67.9	72.9	67.7	68.1	70.5	71.4
47:45	"	"	95.7	98.4	86.2	95.9	"	90.1	"	77.4	88.7	"
48:45	"	"	53.9	55.7	50.9	56.1	"	51.2	"	45.1	52.4	"
52:51	78.1	90.2	76.9	82.5	78.9	82.9	85.4	76.2	79.5	76.7	79.5	82.9
54:55	39.7	55.1	56.2	46.3	55.3	46.9	47.1	48.9	57.8	53.2	47.2	57.1
63:62	97.5	78.7	84.4	-	87.8	74.0	107.5	81.8	82.2	97.6	"	91.1

Table 7 Anatomical variations and anomalies

Variations		Male	Female	Juv.	Total
Sutura metopica		4	6	-	10
Os apicis		6	1	1	8
Os apicis bipartitum		-	1	-	1
	Total:	6	2	1	9
Ossa Wormiana in sutura lambdoidea	left side	4	1	1	6
	right side	1	6	1	8
	both sides	14	10	1	25
	Total:	19	17	3	39
Ossa Wormiana in sutura coronalis	left side	-	-	1	1
Ossa Wormiana in sutura sagittalis		2	4	1	7
Ossa Wormiana at incisura parietalis	left side	1	1	1	3
	right side	2	3	-	5
	Total:	3	4	1	8
Os epipiericum	left side	2	1	-	3
	right side	3	1	-	4
	Total:	5	2	-	7
Os bregmathicum		1	-	-	1
Bathrocephalia		2	2	-	4
Torus palatinus sagittalis		2	1	-	3
Perforatio fossae olecrani humeri	left side	2	3	-	5
	right side	2	3	-	5
	both sides	2	2	1	5
	Total:	6	8	1	15
Sacrum bifidum	craniale	2	-	1	3
	caudale	13	3	-	16
	cran + caud	1	-	-	1
	whole	1	-	-	1
	Total:	17	3	1	21
condylosis		17	1	-	18

Table 8 Parameters of the facial flatness - Males

Characteristics	N	V	M	s
1. Bi-malar chord (43_1)	15	88.3-103.2	96.33	4.44
2. Bi-malar subtense	15	16.2- 22.6	19.53	1.96
3. Zygomaxillar chord	15	83.5-103.2	94.20	6.14
4. Zygomaxillar subtense	15	22.8- 28.0	24.60	1.51
5. Dacryal chord (DC)	12	19.8- 29.2	22.33	2.64
6. Dacryal subtense (DS)	12	10.4- 15.0	13.08	1.44
7. Simotical chord (SC)	14	6.4- 12.8	10.00	1.88
8. Simotical subtense (SS)	14	4.3- 7.8	5.86	1.25
9. Malar chord (C)	15	45.2- 55.6	51.60	3.23
10. Malar subtense (S)	15	5.9- 12.8	10.27	1.91
11. Incisure maxillo-malar chord (IMMC)	15	19.6- 31.0	26.60	3.14
12. Incisure maxillo-malar subtense (IMMS)	15	2.5- 8.8	5.80	1.83
13. Dacryal index (ID)	12	47.9- 72.4	59.83	7.88
14. Simotical index (IS)	14	46.1- 82.1	58.71	10.92
15. Malar arc index (S: C)	15	13.1- 24.8	19.87	3.03
16. IMM index (IMMS: IMMC)	15	8.9- 33.7	21.93	6.62
17. Nasomalar angle	15	131.0-140.8	135.73	2.80
18. Zygomalar angle	15	114.6-131.9	124.73	4.35
19. Fossa canina	15	1.0- 7.8	4.73	1.88

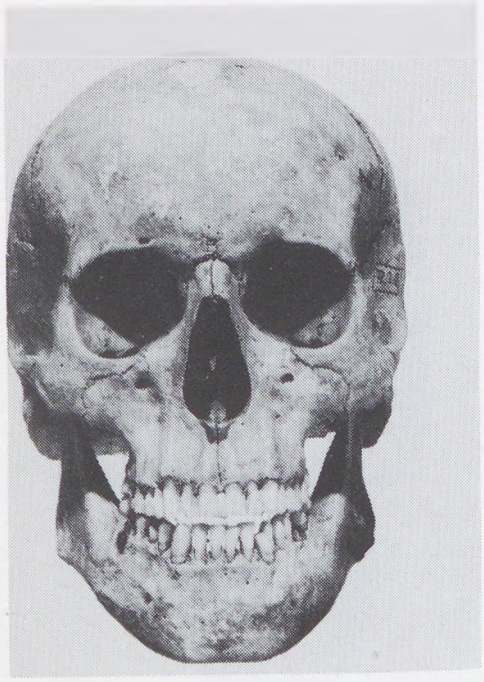
Table 9 Parameters of the facial flatness - Females

Characteristics	N	V	M	s
1. Bi-malar chord (43_1)	12	90.6- 97.2	93.50	1.98
2. Bi-malar subtense	12	15.5- 21.4	18.42	1.78
3. Zygomaxillar chord	12	85.8- 97.0	91.58	3.90
4. Zygomaxillar subtense	12	18.4- 28.3	24.00	3.07
5. Dacryal chord (DC)	11	17.9- 24.5	21.27	1.96
6. Dacryal subtense (DS)	11	9.3- 12.7	10.73	1.13
7. Simotical chord (SC)	11	7.0- 12.3	9.73	1.81
8. Simotical subtense (SS)	11	2.0- 5.4	4.36	0.93
9. Malar chord (C)	11	42.7- 53.8	48.09	3.45
10. Malar subtense (S)	11	8.4- 12.0	10.09	1.18
11. Incisure maxillo-malar chord (IMMC)	12	19.7- 30.6	26.00	3.64
12. Incisure maxillo-malar subtense (IMMS)	12	3.6- 13.1	6.58	1.42
13. Dacryal index (ID)	11	39.6- 70.9	51.09	8.03
14. Simotical index (IS)	11	28.6- 59.5	43.55	7.97
15. Malar arc index (S: C)	11	17.7- 24.5	21.09	2.02
16. IMM index (IMMS: IMMC)	12	11.8- 42.8	25.58	8.93
17. Nasomalar angle	12	131.0-142.9	137.17	4.09
18. Zygomaxillar angle	12	117.4-135.0	124.75	5.62
19. Fossa canina	12	1.0- 8.7	3.92	2.08

Table 10 Taxonomical analysis

Types		Male	Female	Total
Cromagnoids	crA	2	1	3
	crA-x	4	-	4
	crB	1	-	1
	crB-x	1	1	2
		8 (26.7%)	2 (6.6%)	10 (33.3%)
Mediterraneans	m	3	-	3
	m-x	-	1	1
	am	1	-	1
	am-x	1	-	1
	i-x	1	-	1
		6 (20.0%)	1 (3.3%)	7 (23.3%)
Brachycranials	p	1	-	1
	d	1	-	1
	d-x	1	-	1
		3 (10.0%)	-	3 (10.0%)
Nordoids	n	1 (3.3%)	-	1 (3.3%)
Chamaecranic - Europids		1 (3.3%)	1 (3.3%)	2 (6.6%)
Europo-Mongoloids	eu-sa	-	1	1
	eu-si	-	1	1
	n-x (moid)	-	1	1
	m-moid	-	3	3
	eu-moid	-	1	1
		-	7 (23.3%)	7 (23.3%)
	Total:	19 (63.3%)	11 (36.6%)	30

Plate I - Solymár, Grave No. 20, Male, Adultus, d
Plate II - Solymár, Grave No. 25, Male, Maturus, n
Plate III - Solymár, Grave No. 49, Male, Maturus, crA
Plate IV - Solymár, Grave No. 79, Female, Adultus, eu-si
Plate V - Solymár, Grave No. 82, Female, Adultus, Cham-eur/n



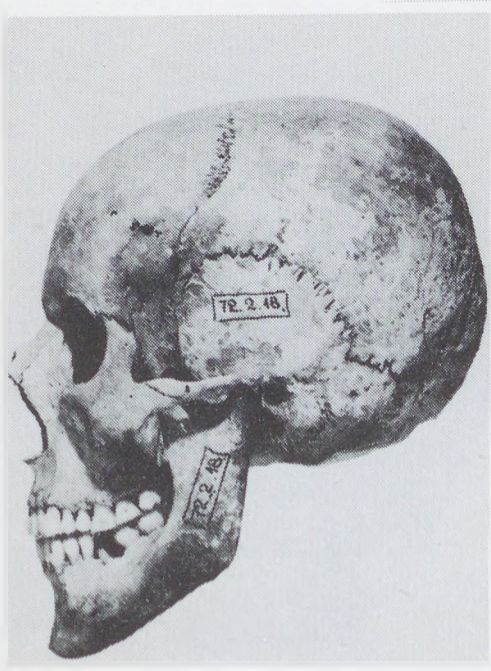
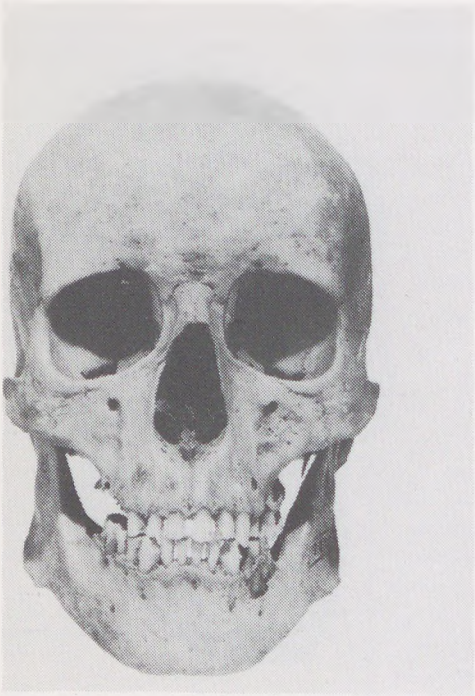
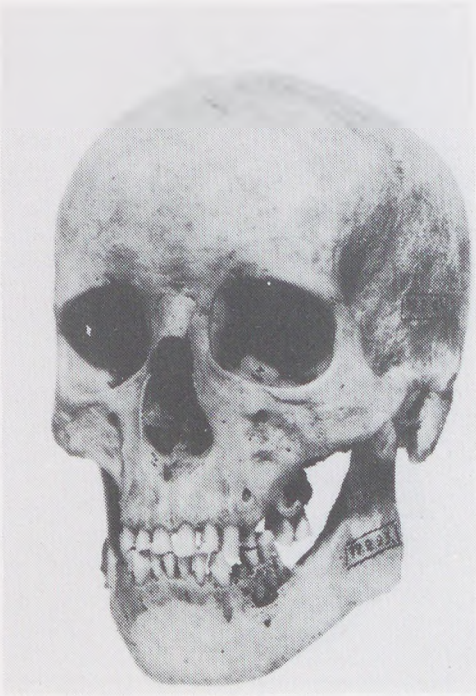
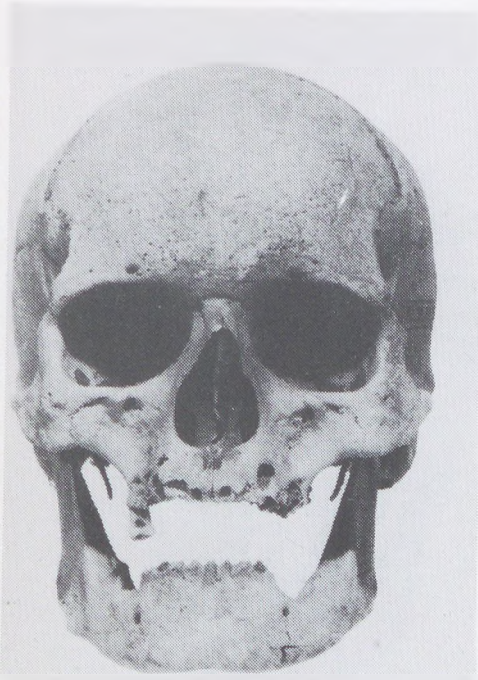
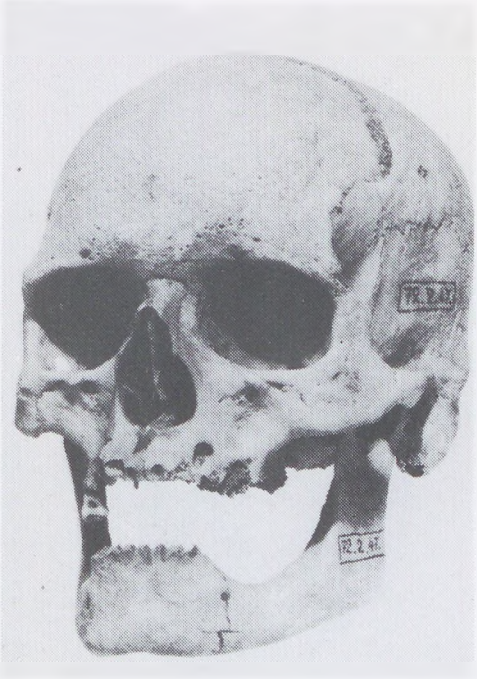

72.2.18.
72.2.18

Plate II








72.2.47.
72.2.47.

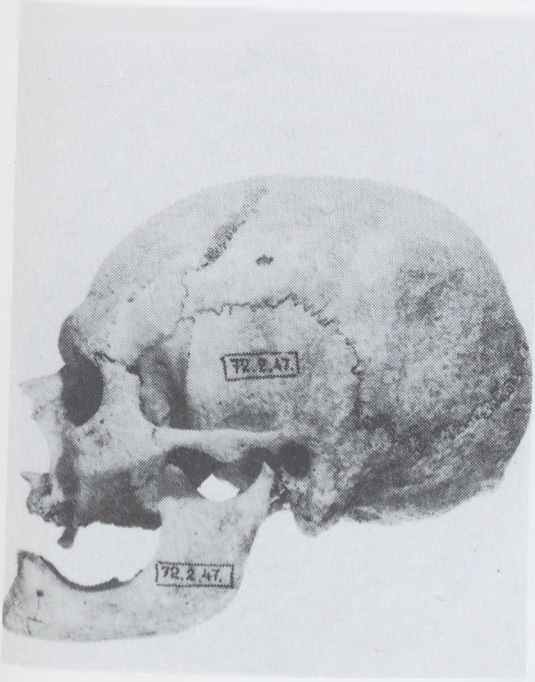

72.2.47.
72.2.47.

Plate IV

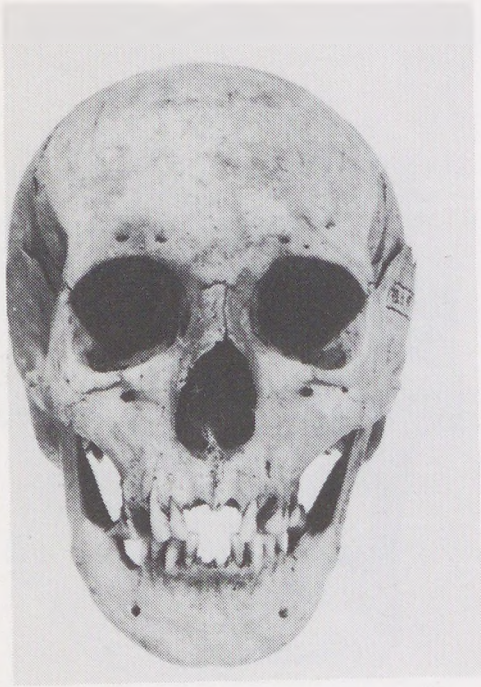
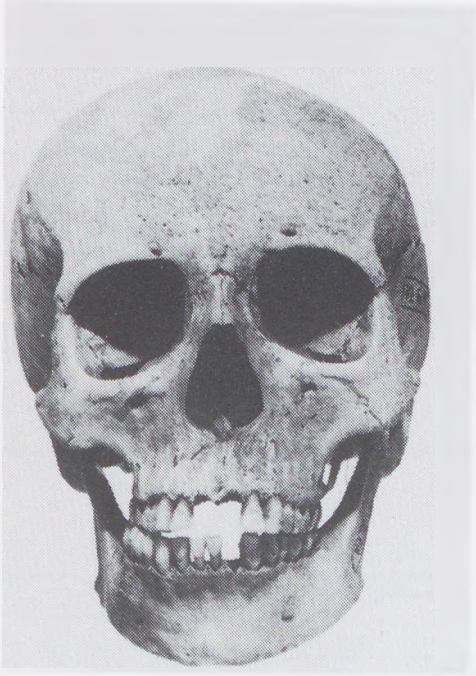
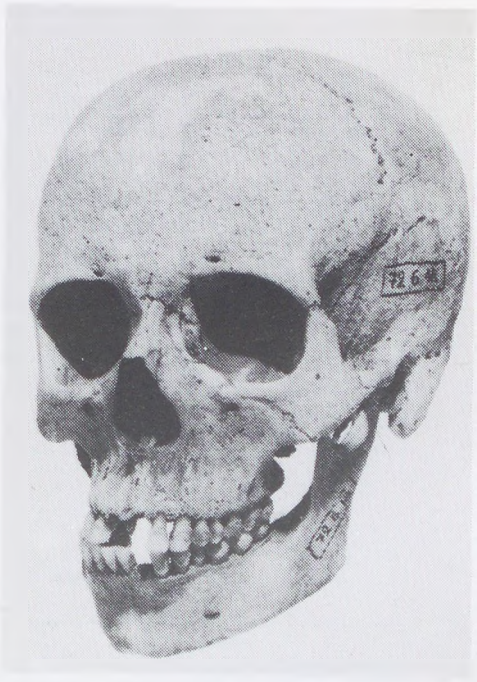


Plate V





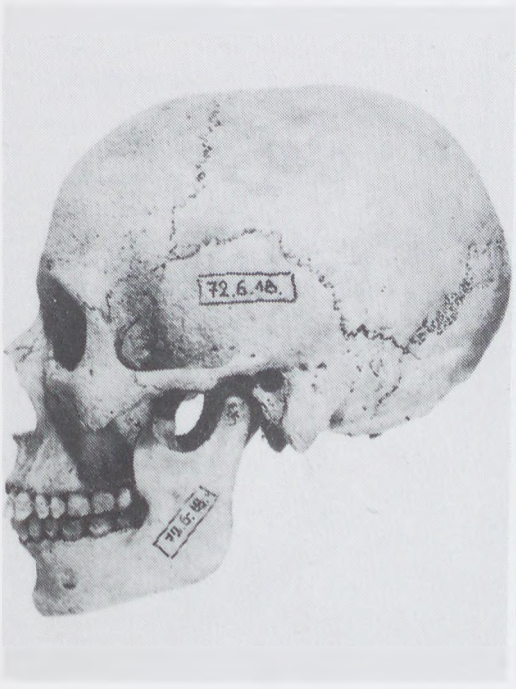


Table 11

Size-, shape- and generalized PENROSE - distance of different male and female series from Solymár

Series	Males			Females		
	C_Q^2	C_H^2	D_P^2	C_Q^2	C_H^2	D_P^2
1. Alattyán-Tulát, 7-8th c.	0.17	0.47	5.24	0.07	0.52	7.15
2. Csákberény, 6-7th c.	0.001	0.16	2.43	0.08	0.31	3.93
3. Előszállás-Bajcsihegy, 6-7th c.	0.10	0.35	4.23	0.02	0.28	4.15
4. Környe, 6-7th c.	0,03	0.43	6.31	0.003	0.46	7.13
5. Szekszárd-Palánk, early avar	0.13	0.48	5.93	0.07	0.56	7.98
6. Tiszavasvár, early avar	1.20	1.51	8.87	1.15	1.54	10.04
7. Üllő I, 8th c.	0.002	0.35	5.40	0.004	0.67	10.39
8. Üllő II, 8th c.	0.01	0.45	6.89	0.0001	0.43	6.72
9. Váchartyán, 7-8th c.	0.05	0.35	4.85	0.00007	0.45	6.97
10. Vác-Kavicsbánya, 7-8th c.	0.01	0.18	2.66	0.009	0.1	1.45

Table 12

Some comparative indices of the neuro- and splanchnocranium - Males and females

Series	Males					Females				
	N	$\frac{17x100}{(1+8):2}$	$\frac{48x100}{17}$	$\frac{52x100}{17}$	$\frac{54x100}{45}$	N	$\frac{17x100}{(1+8):2}$	$\frac{48x100}{17}$	$\frac{52x100}{17}$	$\frac{54x100}{45}$
1. Alattyán-Tulát	110	78.4	53.2	26.1	19.3	101	78.1	52.9	27.0	19.7
2. Budapest-környéke	6	78.2	59.5	27.8	19.5	6	79.4	53.3	27.8	20.5
3. Csákberény	16	81.5	52.9	25.6	18.1	7	81.4	51.7	27.2	19.1
4. Előszállás-Bajcsi-hegy	34	80.7	53.0	27.1	19.9	30	82.2	51.8	27.5	21.2
5. Környe	14	83.6	50.5	23.9	19.4	6	83.3	51.3	25.1	18.3
6. Szekszárd-Palánk	25	83.0	51.6	24.1	18.8	35	82.7	51.5	25.7	19.1
7. Tiszavasvár	21	85.9	51.9	25.1	19.0	29	85.2	50.9	26.1	20.6
8. Üllő I	54	80.0	54.9	25.1	19.3	45	79.6	54.2	26.3	19.5
9. Üllő II	28	79.7	53.8	24.3	18.9	34	80.4	52.9	25.7	19.7
10. Váchartyán	10	80.4	52.2	25.8	18.5	14	78.8	52.2	26.8	18.3
11. Vác-Kavicsbánya	24	83.7	48.0	24.0	19.0	22	82.6	47.6	24.9	20.4
12. Solymár	20	83.1	51.1	25.1	19.2	12	82.2	49.8	25.7	20.6

Table 13 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.x Budapest környéke	139.9	126.4	20.2	11.5	8.0	4.2	28.5
3.+ Csákberény	137.5	124.0	20.5	12.8	8.9	4.9	33.5
4. Csepel-szabadkikötő	137.3	115.5	22.0	12.1	8.8	4.5	-
5.+ Előszállás-Bajcsi-hegy	140.8	126.3	22.2	11.8	9.1	4.8	29.6
6.+ Környe	136.7	123.0	20.6	13.2	9.4	5.1	28.0
7.+ Üllő I	138.4	122.5	22.0	12.7	8.7	4.6	28.5
8.+ Üllő II	138.3	126.2	22.4	12.7	9.9	5.1	30.0
9.+ Váchartyán	145.3	125.8	21.1	11.1	7.4	3.6	25.8
10. Vác-Kavicsbánya	136.7	122.1	21.5	12.7	9.7	5.1	26.5
11. Solymár	135.7	124.7	22.3	13.1	10.0	5.9	34.0
12. Avars (7-8th c.) (TÓTH 1958)	138.3	124.8	21.5	12.5	9.4	4.9	29.0
13. Europoids (TÓTH 1958)	137.0	125.4	-	13.0	-	5.0	33.0
14. Mongoloids (TÓTH 1958)	148.6	141.6	-	8.3	-	2.2	17.6
15. Conquering Hungarians (TÓTH 1965)	139.1	128.2	20.8	12.7	8.8	4.9	29.1

Table 14 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.x Budapest környéke	144.8	131.4	20.5	8.6	8.8	2.9	17.5
3.+ Csákberény	140.4	124.0	19.8	10.6	8.5	4.0	26.5
4. Csepel-szabadkikötő	140.0	120.8	21.3	10.7	9.7	4.3	23.5
5.+ Előszállás-Bajcsi-hegy	136.4	123.0	20.4	11.5	9.6	4.5	30.8
6.+ Környe	137.0	122.7	18.6	11.2	7.9	4.2	22.6
7.+ Üllő I	141.4	127.9	20.5	10.2	8.6	3.9	21.5
8.+ Üllő II	139.1	125.3	20.9	11.4	9.2	4.3	27.1
9.+ Váchartyán	140.5	125.4	20.1	10.2	9.0	4.4	28.5
10. Vác-Kavicsbánya	138.3	122.5	20.3	11.6	9.6	4.6	27.5
11. Solymár	137.2	124.8	21.3	10.7	9.7	4.4	29.0
12. Avars (7-8th c.) (TÓTH 1958)	140.0	125.8	20.7	10.7	9.0	4.2	25.6
13. Europoids (TÓTH 1958)	137.0	125.4	-	13.0	-	5.0	33.0
14. Mongoloids (TÓTH 1958)	148.6	141.6	-	8.3	-	2.2	17.6
15. Conquering Hungarians (TÓTH 1965)	140.9	131.2	20.1	11.3	9.2	4.1	25.9

+ = TÓTH 1970, x = BOTTYÁN 1966

Table 15 Comparison of the PFC and IC values of some series

Series	N	PFC	IC
1.+ Alattyán-Tulát, 7-8th c.	211	91.7	4.7
2. Budapest-környéke, 6-8th c.	12	94.8	-6.4
3.+ Csákberény, 6-7th c.	21	91.3	5.5
4.+ Előszállás-Bajcsihegy, 6-7th c.	64	90.4	7.0
5.+ Környe, 6-7th c.	20	88.8	3.4
6.+ Üllő I, 8th c.	83	93.5	19.7
7.+ Üllő II, 8th c.	48	91.4	7.1
8.+ Váchartyán, 7-8th c.	25	92.9	22.8
9. Vác-Kavicsbánya, 7-8th c.	46	88.2	-6.2
10. Solymár, 7-8th c.	32	88.7	-2.9
11. Europoids; Medieval Epoch, North Region SU (DEBETS 1961)	1771	89.9	10.6
12. Europoids; Medieval Epoch, South Region SU (DEBETS 1961)	251	90.0	4.1
13. Europo-mongoloids; Sarmatian period, North Region SU (DEBETS 1961)	277	91.6	34.0
14. Mongoloids; Early Iron Age, SU (DEBETS 1961)	25	97.7	85.8
15. Conquering Hungarians (10th c.) (DEBETS 1964, TÓTH 1965, 1969)	122	91.5	17.0

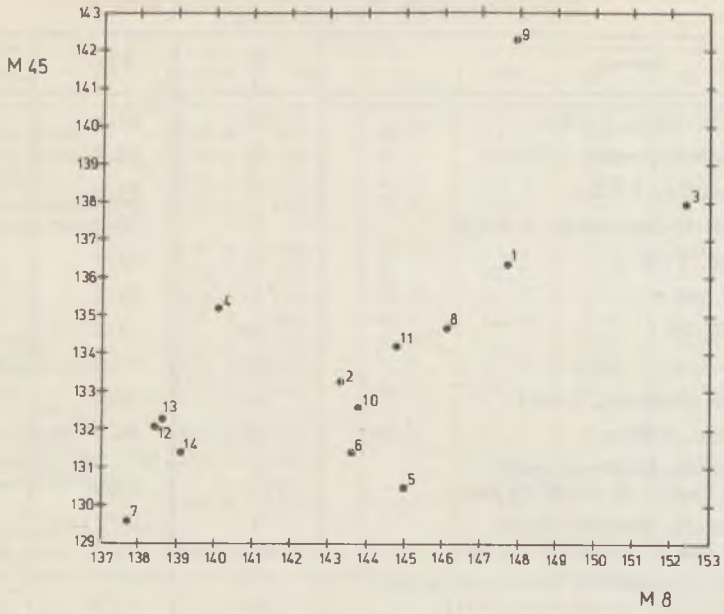
+= TÓTH 1973

Sequence of series of Figures 1-10 are the following:

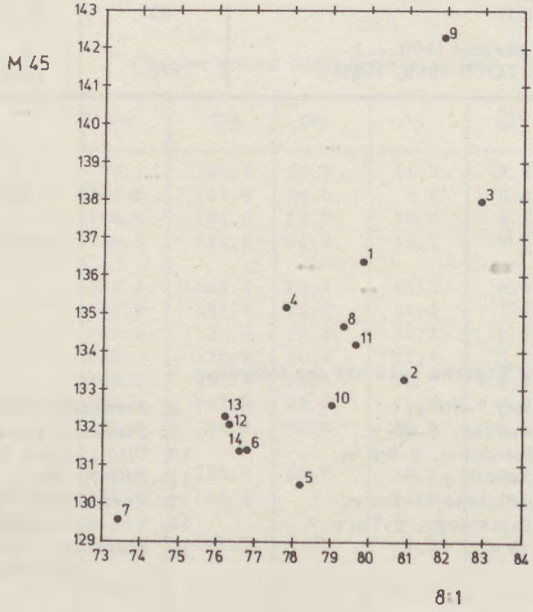
1. Alattyán-Tulát, 7-8th c.
2. Budapest-környéke, 6-8th c.
3. Budapest-Népstadion, 6-9th c.
4. Csákberény, 6-7th c.
5. Csepel-szabadkikötő, 7-8th c.
6. Előszállás-Bajcsihegy, 6-7th c.
7. Környe, 6-7th c.
8. Szekszárd-Palánk, early avar
9. Tiszavasvár, early avar
10. Üllő I, 8th c.
11. Üllő II, 8th c.
12. Váchartyán, 7-8th c.
13. Vác-Kavicsbánya, 7-8th c.
14. Solymár, 7-8th c.

Sequences of series of Figures 11-14 are the same as in Table 12
Sequences of series of Figures 15-26 are the same as in Table 13
Sequences of series of Figure 27 are the same as in Table 15

1

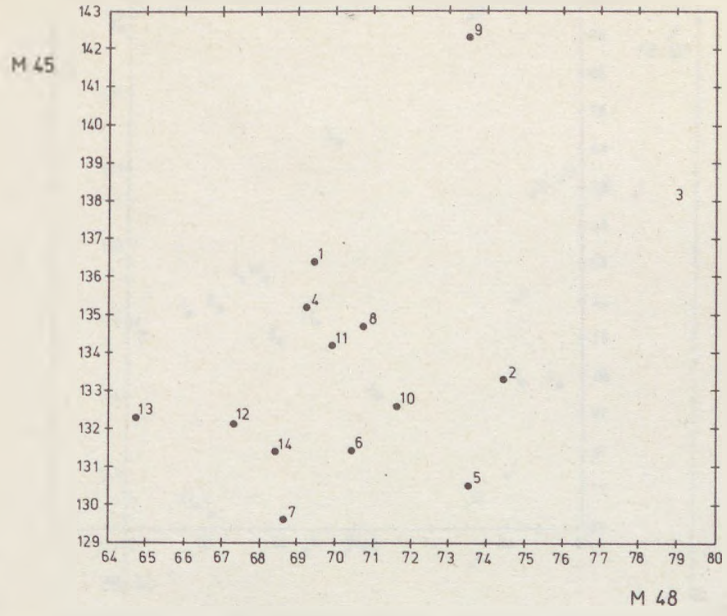


2

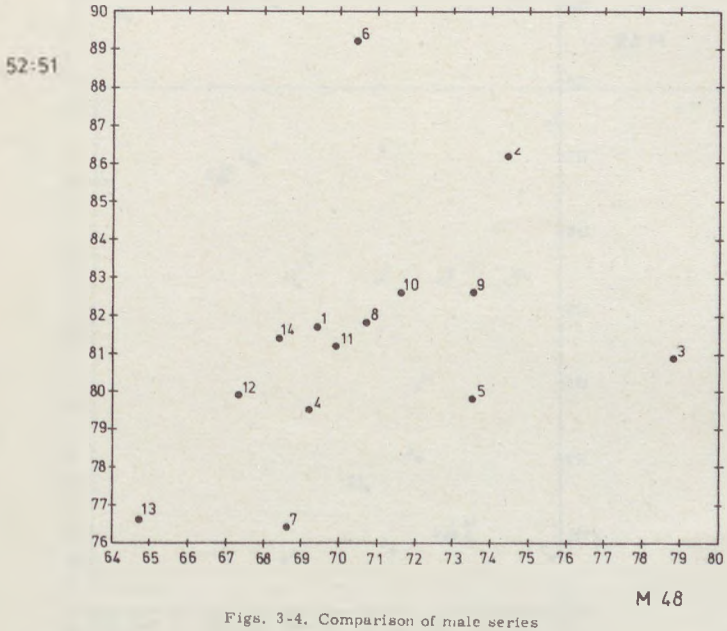


Figs. 1-2. Comparison of male series

3

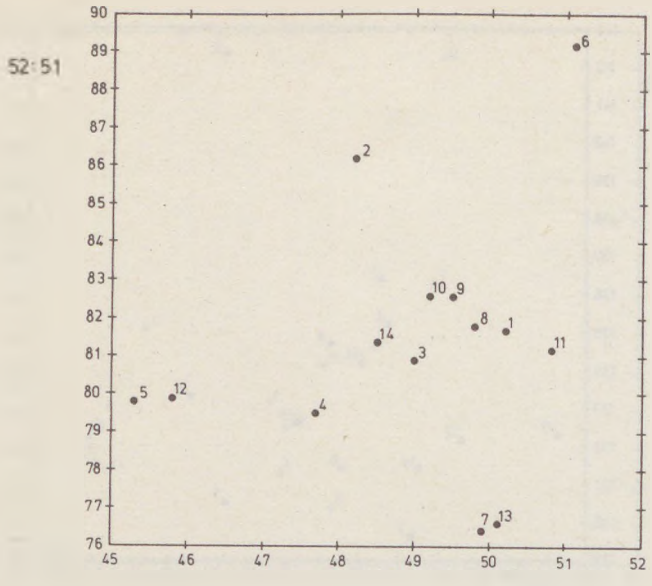


4

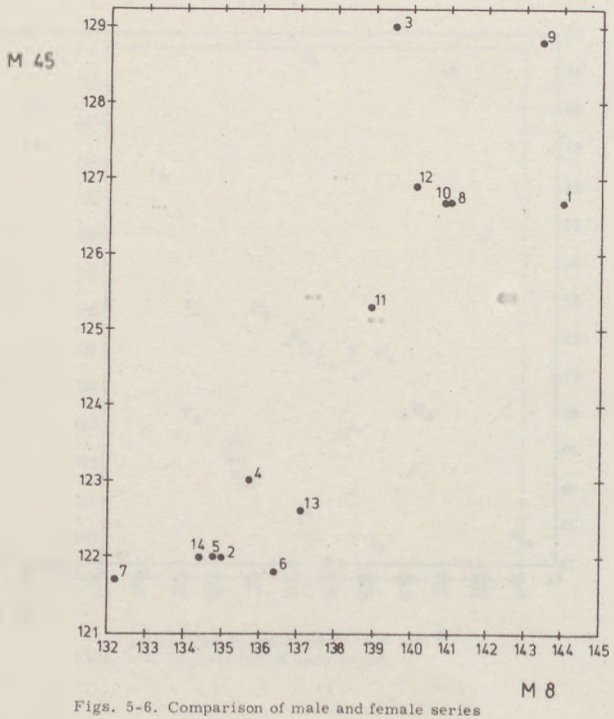


Figs. 3-4. Comparison of male series

5



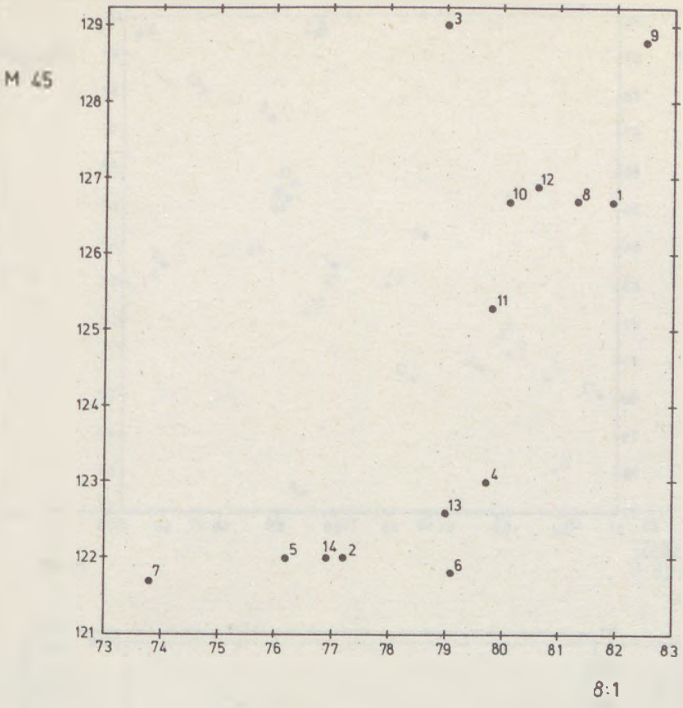
6



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

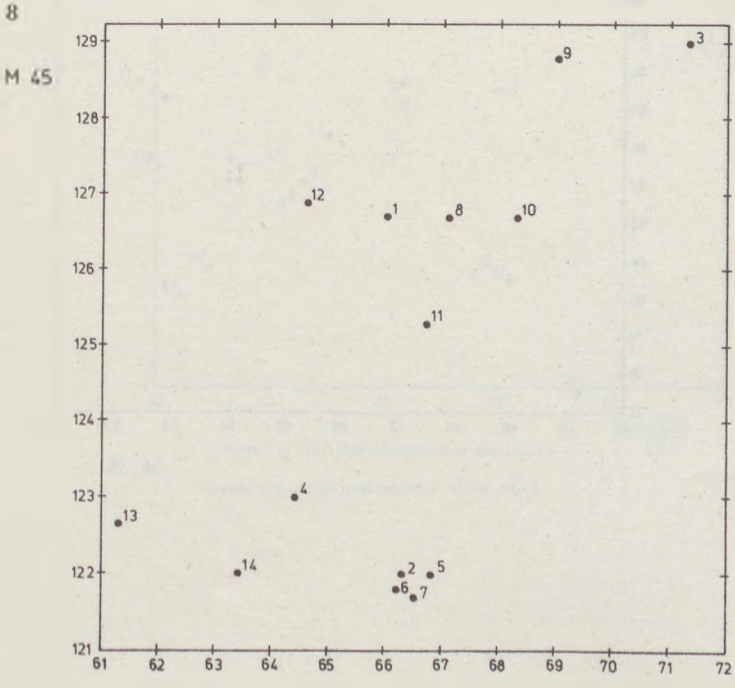
0

7



8:1

8

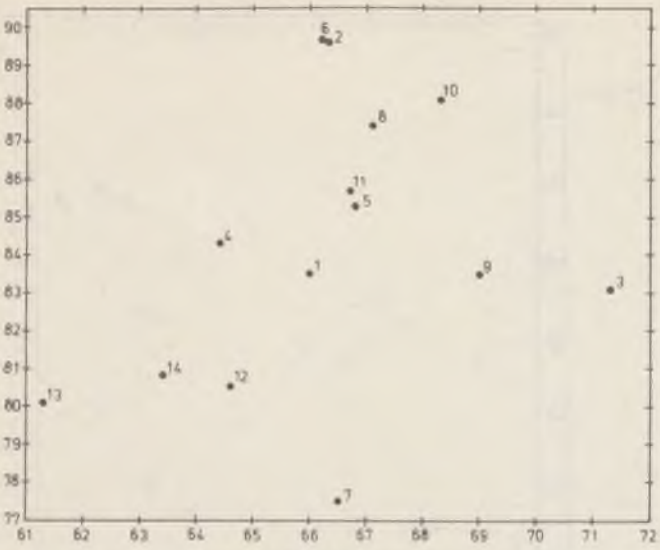


M 48

Figs. 7-8. Comparison of female series

9

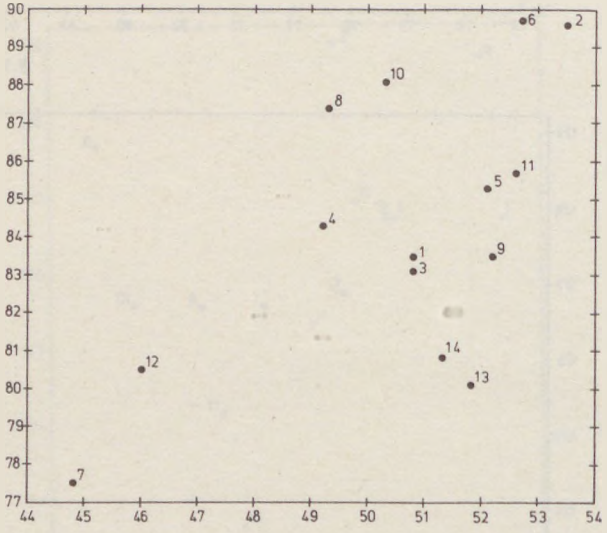
52:51



M 48

10

52:51

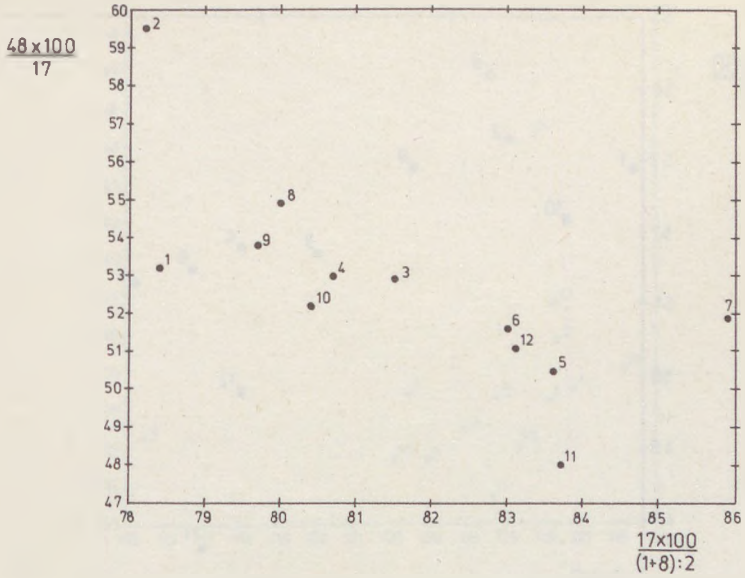


54:55

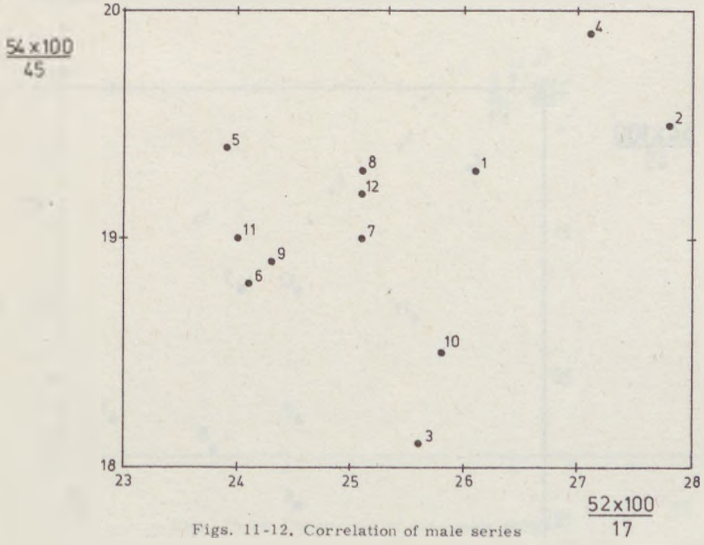
Figs. 9-10. Comparison of female series

32

11

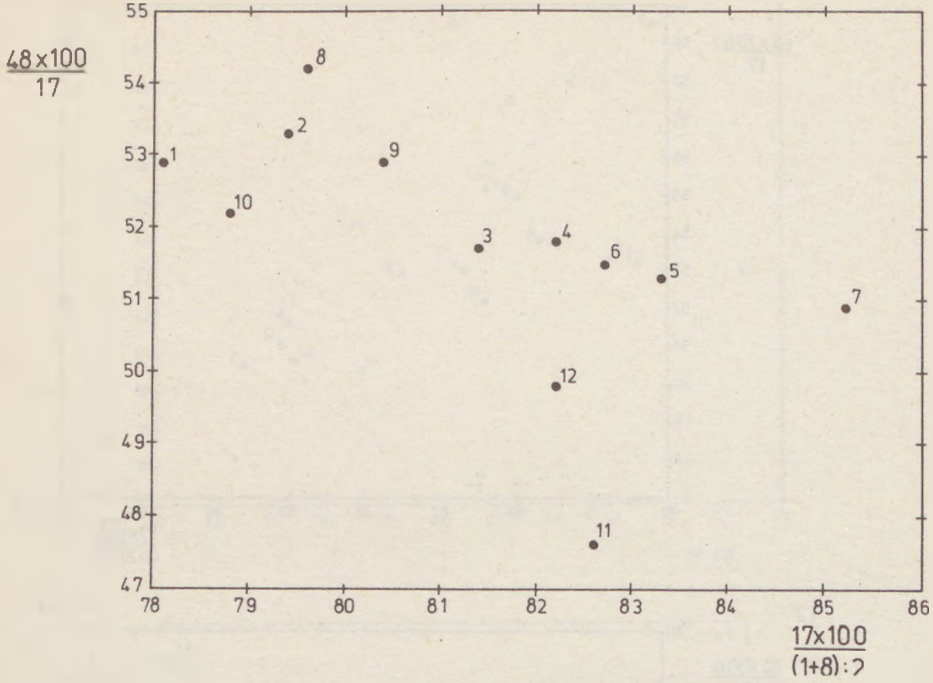


12

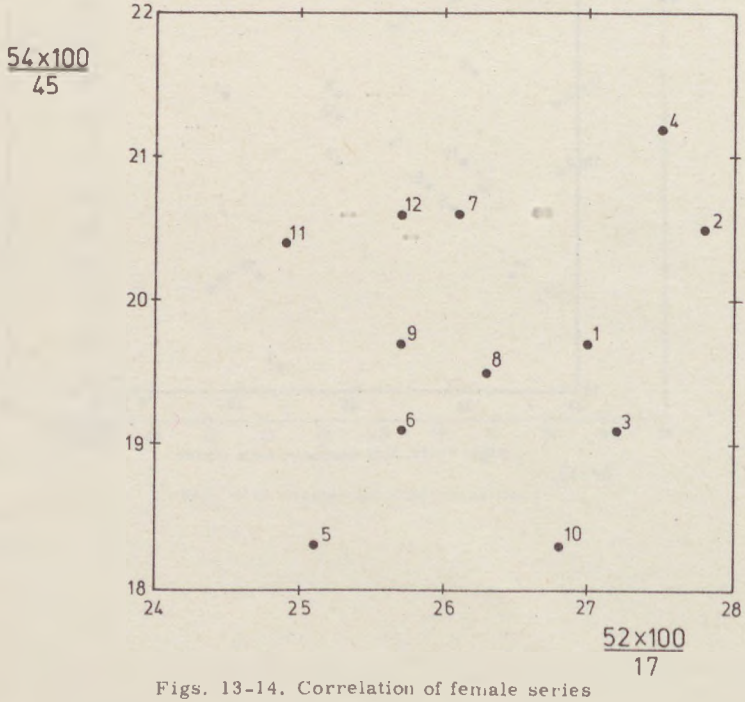


Figs. 11-12. Correlation of male series

13

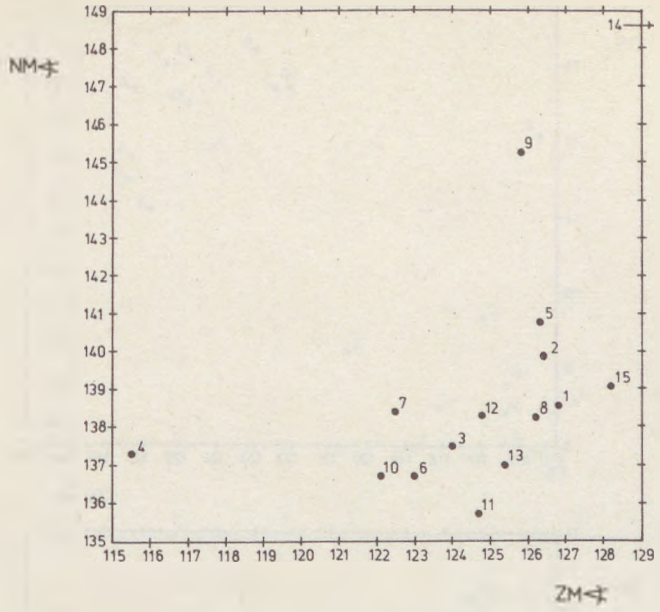


14

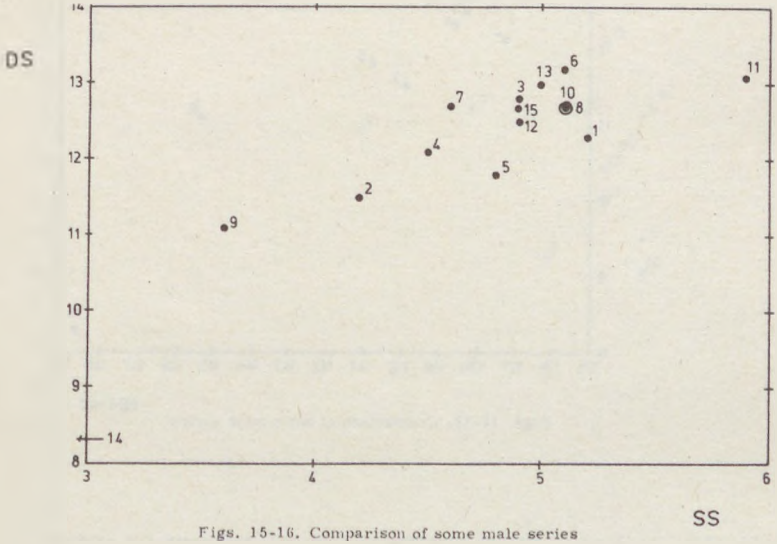


Figs. 13-14. Correlation of female series

15

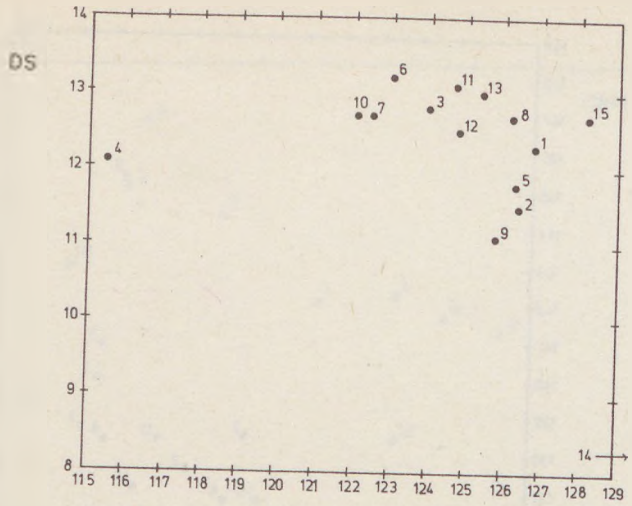


16

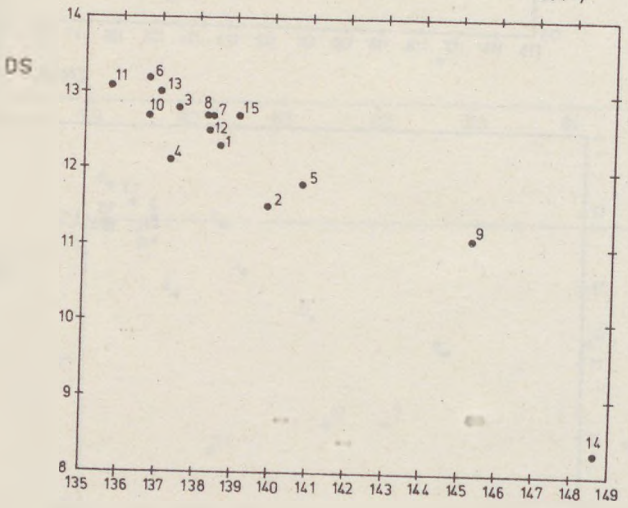


Figs. 15-16. Comparison of some male series

17

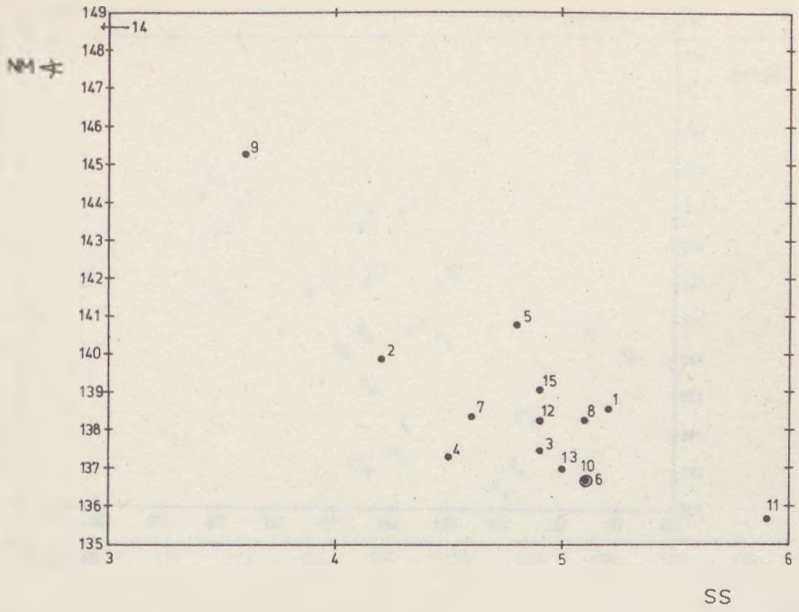


18

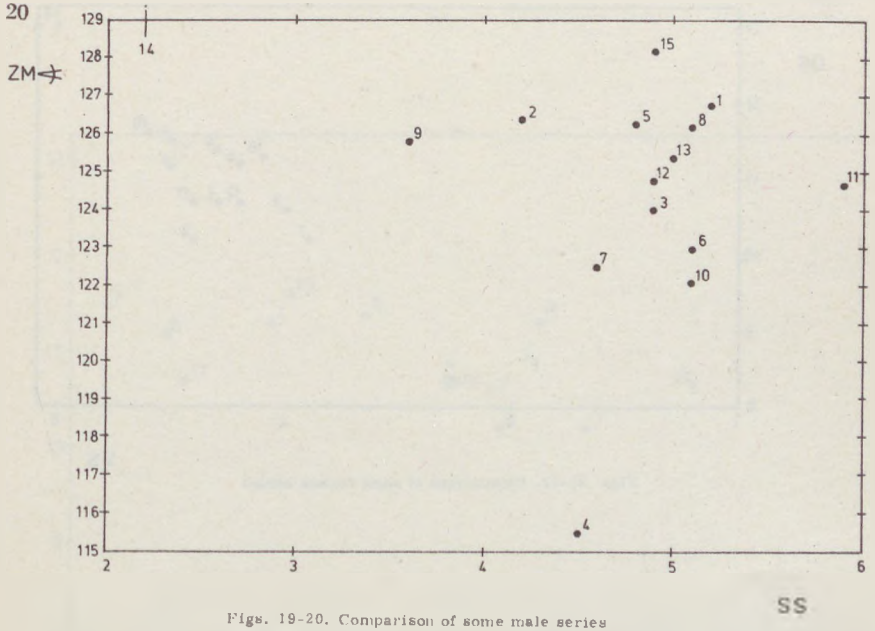


Figs. 17-18. Comparison of some male series

19

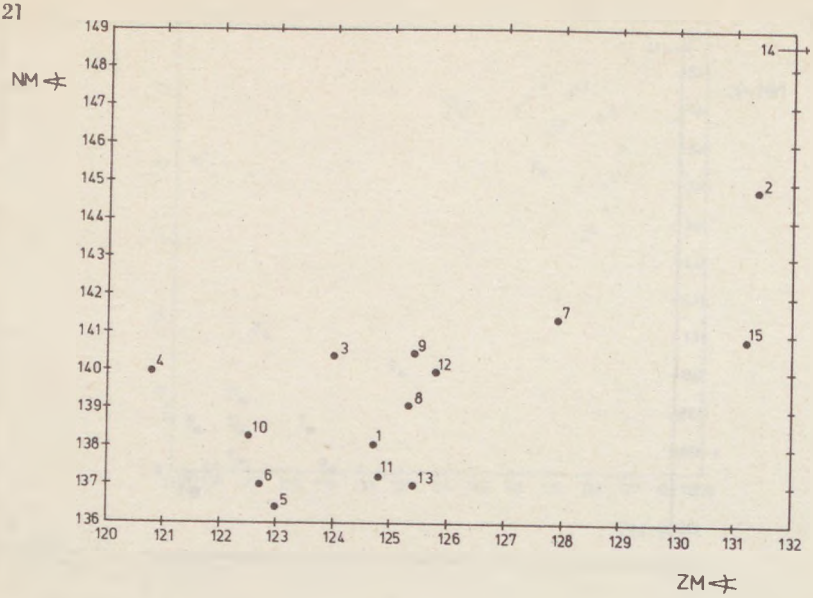


20

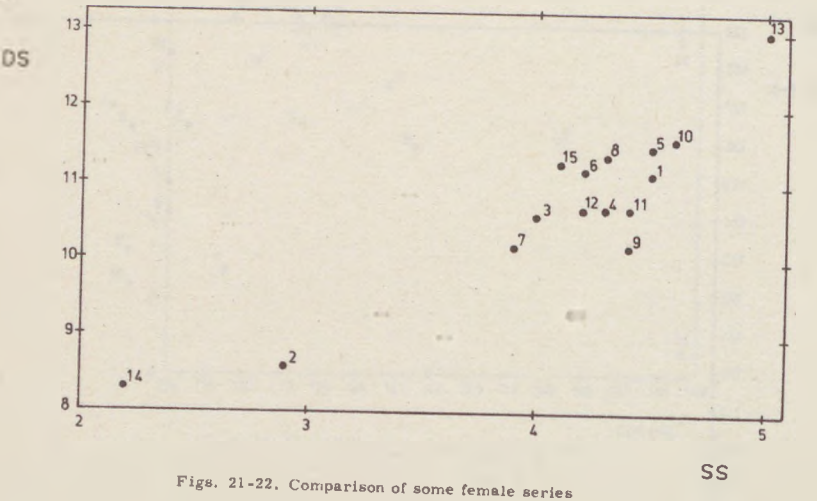


Figs. 19-20. Comparison of some male series

21

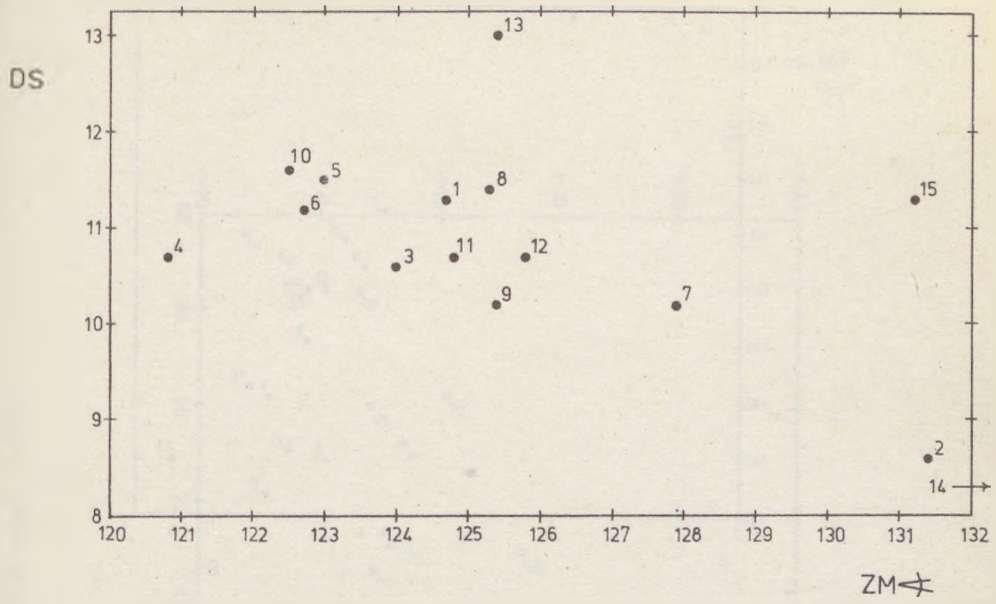


22

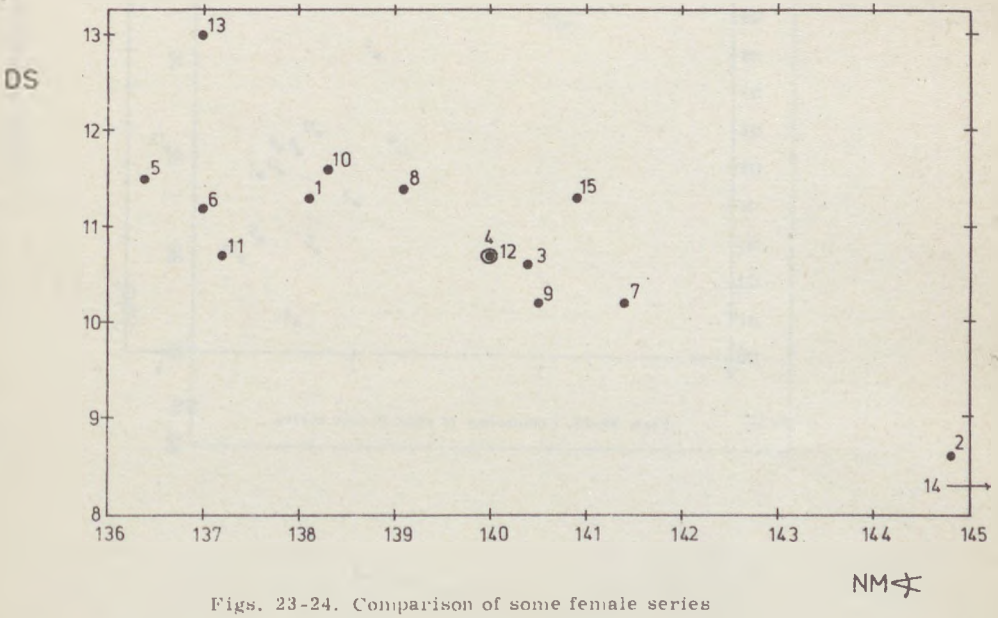


Figs. 21-22. Comparison of some female series

23

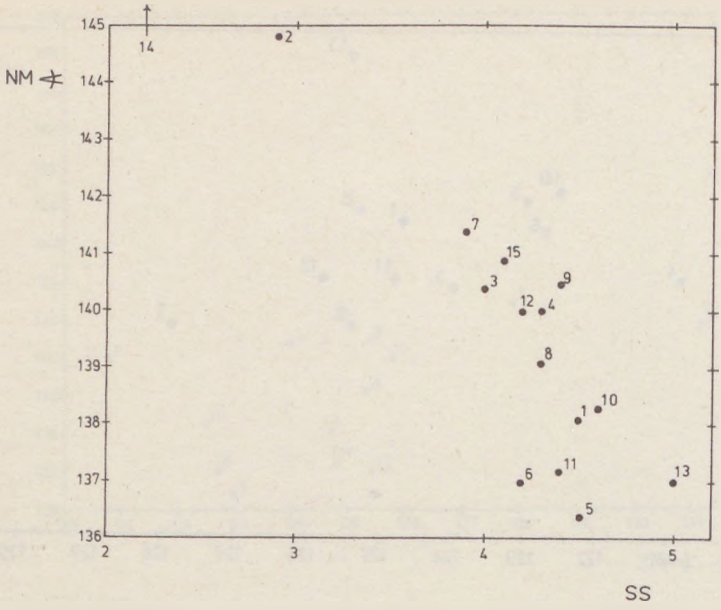


24

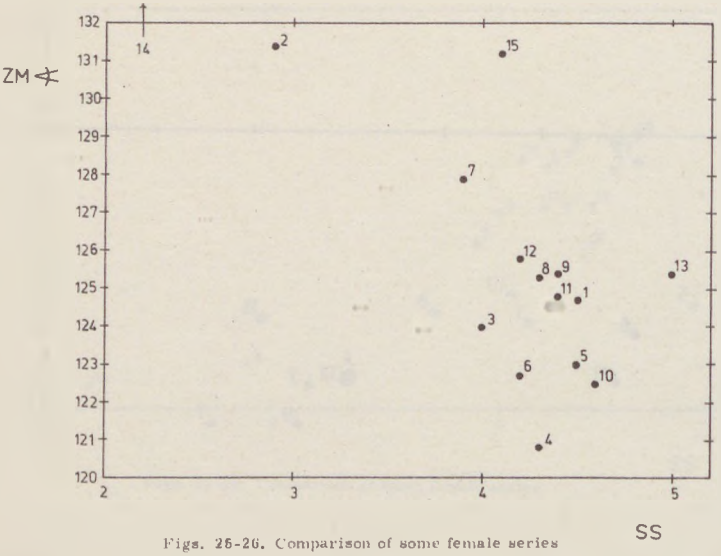


Figs. 23-24. Comparison of some female series

25



26



Figs. 25-26. Comparison of some female series

27

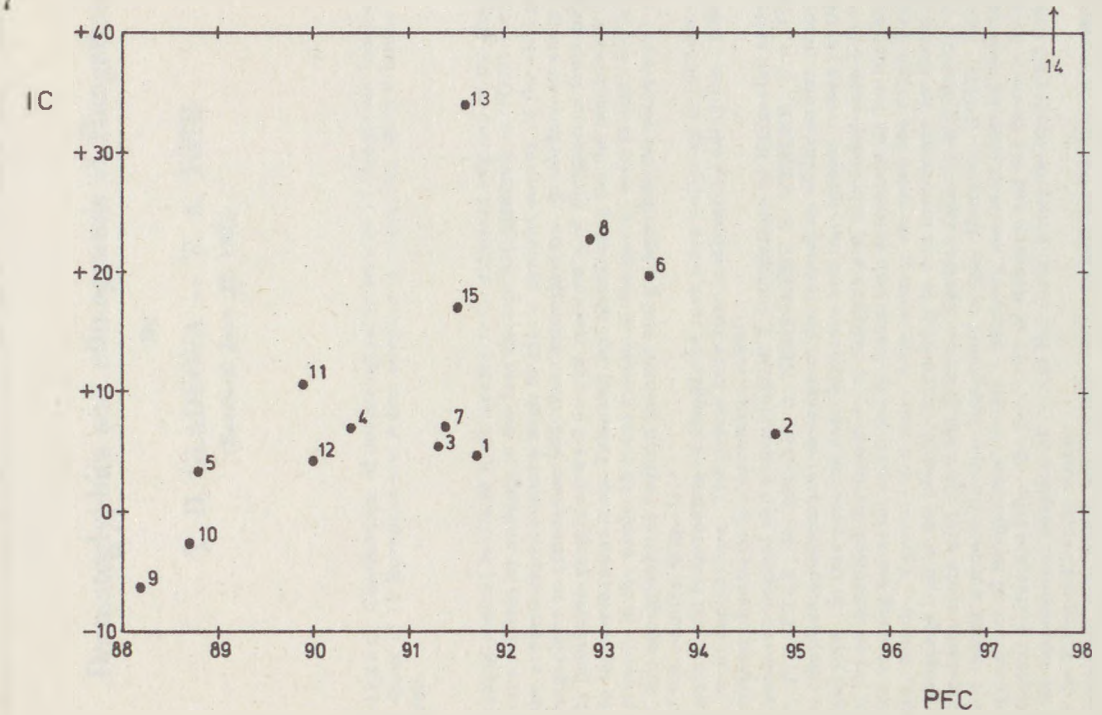


Fig. 27. Comparison of some craniological series

ANTHROPOLOGIA HUNGARICA

XVIII. 1982-1983 p. 43—52

Dermatoglyphics and ethnogenesis of Hungarians

By

T. D. GLADKOVA — T. A. TÓTH

(Received June 23, 1981)

Abstract. Comparison of dermatoglyphic data of 13 Hungarian local groups with those of 19 European and Asian peoples is presented. With 5 tables and 3 figures.

Dermatoglyphical traits of male series from different regions of the Hungarian People's Republic were studied by authors in the last decade (GLADKOVA et TÓTH 1973, 1975, 1977, 1979). In the present paper authors wish to give a general survey of the skin patterns characterising Hungarians in connection with their ethnogenesis. In performed analyses the data of 11 formerly published groups as well as new materials of Hungarians from Szendrő (North Hungary, to the north-west from Taktabáj) and Kustánszeg (to the south-west from Lake Balaton) were used. In the whole 13 local groups of Hungarian men (about 1600 individuals) from 9 different ethnogeographical regions located along a hypothetical south-west - north-east diagonal of the country (Fig. 1).

The palm- and fingerprints of Hungarian men were collected in 1969-1971 by T.A.TÓTH among the rural populations. The prints have been analysed by using the CUMMINS and MIDLO's method of pattern interpretation (1961).

Paleoanthropological and somatological investigations of Hungarian anthropologists (L. BARTUCZ, P. LIPTÁK, M. MALÁN, J. NEMESKÉRI, S. WENGER, T. A. TÓTH and others) showed the complicated historical process of the formation of Hungarian people and its anthropological type. In this process autochthonous and immigrated tribes participated which at different times inhabited the territory of Hungary and succeeded each other.

A wide ranging material collected by Hungarian scientists on the territory of Cis-Ural, Khazakhstan, North-, Central- and Inner Asia clearly revealed the Finno-Ugric origin of the Hungarian language and of the people. According to this hypothesis the Hungarian people has common linguistic roots with the West Siberian Ugrians (Khants and Mansi), belonging to the Uralian race having a mixed Europo-Mongoloid origin. However, TÓTH - having accepted the Ugric hypothesis of Hungarians' origin - studying somatological as well as paleo- and neocraniological materials from the territory of Hungary and the Eurasia concluded that in the whole the taxonomical position of recent Hungarians may be connected with different components of the Europoid racial stock.

In connection with this it will be interesting to sum up the skin patterns of Hungarians because they represent ancient, heritable and ontogenetically stable traits.

In Tables 1-3 the frequency data of the finger and palm pattern are given from the above-mentioned 13 local groups of Hungarians. The survey of these tables shows first of all the extensive variability, dispersity and crossing similarity between the different groups.

Such, the range of the frequencies of arches (A), loops (L) and whorls (W) is in order of the mentioned traits 2.8 (Gacsály) - 8.1 (Gyöngyöstarján), 53.2 (Taktabáj) - 62.8 (Himód) and 32.6 (Kisfalud) - 41.7% (Taktabáj). In respect of the delta index (Dl_{10}) the lowest and highest values are 12.57 (Gyöngyöstarján) and 13.66 (Taktabáj) (Table 4).

According to papers reviewing world-wide materials (CHAMLA 1962-1963; SCHWIDETZKY 1966; GLADKOVA 1966) the frequencies of arches, loops and whorls have following ranges among Europoids 2.3 - 11.8%, 56.5 - 74.8% and 20.2 - 49.0%, whereas the same ranges among Mongoloids are of 0.0 - 5.5%, 43.1 - 58.8% and 38.7 - 59.4%. The range of the delta index (Dl_{10}) is characterized by the values 10.77 - 14.65 in the case of the Europoids, whereas in that one of the Mongoloids by the values 13.45 - 15.90. It is known that southern Europoids are characterized by a higher frequency of whorls and the higher value of delta index than in northern ones.

The presented data about the digital patterns clearly show that the variation of these traits on Hungarians is found between the limits characterising southern Europoids.

It should be mentioned that the highest frequency of loops and the lowest one of whorls have been found in the groups Himód and Kisfalud from North-West Hungary, whereas the highest frequency of whorls and the lowest one of the loops seemed to be characteristic for the Taktabáj groups from North Hungary.

To make comparisons clearer 5 traits were chosen only: type 11 of line D, carpal axial triradius (t), frequency of patterns on hypothenar and that one of pattern on interdigital pads III and IV.

For the Hungarian male groups studied by us the following extreme values were characteristic in order of the above mentioned traits: 34.2 (Kustánszeg) - 51.6% (Himód), 64.4 (Milejszeg) - 76.9% (Himód), 25.3 (Szendrő) - 38.4% (Mezőkövesd), 34.2 (Karcag) - 42.2% (Jászapáti) and 37.3 (Kisfalud) - 58.4% (Mezőkövesd) (Table 4).

Taking into consideration the reviews about world-wide distribution of dermatoglyphical traits (SCHWIDETZKY 1966; GLADKOVA 1966) Hungarian groups are within the ranges of Europoids not only in respect of their above-mentioned characteristics but in the majority of other palm lines and patterns.

Let us compare the dermatoglyphical traits of our Hungarian groups on the basis of a character complex with those of some other peoples. For the analyses eight traits were chosen: arches, loops and whorls on fingers, pattern on hypothenar as well as that one on interdigital pads III and IV, further the frequency of type 11 of line D and carpal axial triradius on palms (Table 5, Fig. 2). Male series from Finnish-Ugrian, Slavic and other peoples were compared ZUBOV's method consisting of the calculation of mean sums of positive and negative deviation from a conventional zero-group applied was. For such a group we took the Khazakhs (GLADKOVA 1964) attributed to be a southern Siberian racial type.

As it is seen in Fig. 2 the Hungarian groups studied by us are located quite close to each other along the diagonal. The group of Hungarians from Kisfalud (11) (West Hungary) stands very far from the conventional zero-group which seems to be very close to the Finns (21) (HIT 1969). Near the other end of the diagonal the group Szendrő (31) (North Hungary) is placed being close to Bashkirs (15) and Udmurts (29) (AKIMOVA 1972) as well as to Mansis ivdelsky (23) (GLADKOVA 1961). The group Taktabáj (7) (North Hungary) stands slightly to the right of the diagonal, and nearer to the zero-group. The groups Belorussians (13) (ANTONIUK 1975), Osetins (14) (PETRENKO 1977), Andicis (17) and Ginuchcis (18) (GLADKOVA & RAMAZANOV 1977) are also characterized by values lying in the middle of the diagram, very close to the Hungarian groups.

The group of Madzaris (19) (GLADKOVA & TÓTH 1970) is nearest the zero-group characterized morphologically by the traits of the South Siberian race. The place of the Khants (24) (GLADKOVA & HIT 1968) belonging to the Uralian race is also worth mentioning. The Madzaris are characterized by a very high frequency of carpal axial triradius and a high one of whorls.

Most remoted from the conventional zero-group are standing the Roumanians (25) (VULPE 1972), Russians (12) (PROKUDINA 1971), Avars (16) (GADZHIEV 1962) and recent population of Budapest (27) (MALÁN 1939, 1940).

Our complex of traits does not include the summarized values of delta index (Dl_{10}) and Cummins index (Ic). As an indicator of mean number of deltas per one examined subject the index of pattern intensity (Dl_{10}) cannot substitute the frequency of loops and whorls. This index depends on the frequency of arches in the sample and on the correlation between loops and whorls. The Cummins index - as an indicator of the total direction of the palm skin lines - is little variable and its values may be the same under different termination of the main palm lines ABCD. For example, with the formula of palm lines 11.10.8.2 the Cummins index is 8

(6. -. -. 2); the index has the same value with the formula 8.6.5'.5' (3. -. -. 5). Meanwhile, the termination of line D in field 11 is included in type 11 D, in field 8 - in type 7 D.

Inspite of these both of the mentioned indices are of great value because they obviously reflect the total pattern intensity of finger and palm dermatoglyphics. For this reason in respect of these traits we compared our groups separately with Russians (PROKUDINA 1971) and Khazakhs (GLADKOVA 1964). Delta index and Cummins index have the values for Russians 12.59 and 8.72, whereas for Khazakhs 14.93 and 8.08, respectively. The distribution of the studied Hungarian groups according to these indices is given in Fig. 3, in which Russians (14) are situated in the upper part of the diagram to the left, whereas Khazakhs (15) in the lower part to the right. The majority of the Hungarian samples is located between the two groups. The groups Mezőkövesd (6) and Kustánszeg (13) have a special place in the diagram because they are characterized by the lowest values of the Cummins index. In comparison to the other groups these two samples are characterized by the lowest frequencies of types 11 D and 5 A, too.

Thus, on the whole, the Hungarian male series studied by us are within the limits of the variation characteristics for Europoids in respect of the majority of different dermatoglyphic traits as well as the complexes of palm and finger patterns. Beyond that dispersity and crossing similarity between groups could be observed in respect of a number of traits.

Having included the new data about the dermatoglyphical traits of the groups Szendrő (31) and Kustánszeg (32) in our analyses the slight influence of "Mongoloidity"could be shown in the northern regions of Hungary, especially in the villages Szendrő and Taktabáj. The slight admixture may be to some degree explained by the preservation of some morphological features inherited from eastern tribes that arrived in the territory of Hungary at the end of the first millenium - beginning of the second.

Similarly to the above mentioned dermatoglyphics somatological and odontological data also confirm the prevalence of different components from the Europoid racial stock in mosaic composition of the Hungarian male population (TÓTH 1977).

REFERENCES

AKIMOVA, M.S. (1972): Importance of dermatoglyphics data in studies of mixed groups (Bashkirian material). - in: Man, Evolution and Intraspecific Differentiation. Nauka, Moskva: 167-180.

ANTONIUK, S.A. (1975): Additional data on dermatoglyphics of Western Belorussians. - Quest. Anthrop. 49: 142-156.

CHAMLA, M. (1962-1963): La répartition géographique des crêtes papillaires digitales dans le monde: nouvel essai des synthese, I-II. - Anthropologie 66: 526-541, 67: 1-47.

CUMMINS, H. & MIDLO, Ch. (1961): Finger prints, palms and soles. An introduction to dermatoglyphics. - New York: 319 pp.

FORMICOLA, V. (1975): Dermatoglifi digitali e palmari di 200 lunigianesi (100 maschi a 100 femmine). - Atti Soc. tosc. sci. natur. Mem. 82: 97-111.

GADZHIEV, A. (1962): The materials on the dermatoglyphics of the Daghestan peoples. - Quest. Anthrop. 9: 60-71.

GLADKOVA, T.D. (1961): The dermatoglyphics of some nationalities in North-East USSR (Mansi and Komi). - Quest. Anthrop. 6: 100-112.

GLADKOVA, T.D. (1964): Materials to the dermatoglyphics in Kazakhs. - Quest. Anthrop. 16: 77-85.

GLADKOVA, T.D. (1966): Skin patterns of hand and sole of monkeys and man. Nauka, Moskva: 151 pp.

GLADKOVA, T.D. & RAMAZANOV, A.I. (1977): Some data on dermatoglyphics of Andians and Guinuhians. - Quest. Anthrop. 56: 126-133.

GLADKOVA, T.D. & HIT, G.L. (1968): The materials on dermatoglyphics of some peoples of Siberia. - in: The problems of anthropology and historical ethnography of Asia. Nauka, Moskva: 127-147 pp.

GLADKOVA, T.D. & TÓTH, T.A. (1970): New data dermatoglyphics of Uzbeks. - Quest. Anthrop. 34: 98-108.

GLADKOVA, T.D. & TÓTH, T.A. (1973): Dermatoglyphics of Hungarians (to problems of the origin of Hungarian peoples). Report on IX ICAES in Chicago, September, 1973. - Nauka, Moskva 1-19.

GLADKOVA, T.D. & TÓTH, T.A. (1975): Contribution to the problem of the origin of Hungarian people according to dermatoglyphical data. - Quest. Anthrop. 51: 43-57.
GLADKOVA, T.D. & TÓTH, T.A. (1977): On the distribution of dermatoglyphics in Hungary, new contribution from Karcag. - Annls hist.-nat. Mus. natn. hung. 69: 361-371.
GLADKOVA, T.D. & TÓTH, T.A. (1979): The dermatoglyphical materials of Hungarians from Gyöngyöstarján and Kisfalud. - Annls hist.-nat. Mus. natn. hung. 71: 329-339.
HIT, G.L. (1969): Dermatoglyphics of the population of Finland and adjusting regions of the USSR. - Quest. Anthrop. 32: 163-171.
KHAZANOVA, A.B. (1971): The dermatoglyphics of Lapps and Komi of Kola Peninsula. - Quest. Anthrop. 37: 143-148.
MALÁN, M. (1939): Papilláris minták vizsgálata hazai anyagon. - Math. Naturwiss. Anz. Ung. Akad. Wiss. 58: 771-782.
MALÁN, M. (1940): Die Handlinien und Muster der Ungarn. - Verh. deutsch. Ges. Rassenf. 10: 136-150.
PETRENKO, G.E. (1977): The materials on the dermatoglyphics of Osset. - (Diploma work, unpublished).
PROKUDINA, N.A. (1971): Dermatoglyphics in Russian East Europe. - Quest. Anthrop. 39: 138-153.
REMANE, A., SCHWIDETZKY, I., WALTER, H. & KNUSSMAN, R. (1962): Die neue Rassenkunde. - Stuttgart.
TÓTH, T. (1977): Somatologia i paleoantropologia naselenia Vengrii. - Doct. thesis, Moskva: 1-35. pp.
VULPE, C. (1972): Observatii asupra reliefului cutanar digitopalmar si plantar la populatia din Magura. - Stud. si. cerc. antropol. 9 (2): 167-175.

Authors' address: T.D. GLADKOVA
Anthropological Institute
State University of Moscow
Karl Marx prospekt, 18
Moscow, K-9 USSR

DR. TIBOR TÓTH
Anthropological Department
Hungarian Natural History Museum
Budapest, Bajza utca 39.
H-1062

Table 1 The finger patterns frequency (%) and indices

Traits	Örség	Milej-szeg	Kun-hegyes	Jász-apáti	Gacsály	Mező-kövesd	Takta-báj	Himód	Karcag	Gyön-gyös-tarján	Kis-falud	Szendrő	Kustán-szeg
	102	94	149	78	97	123	122	112	147	162	135	150	124
A	4.40	3.15	6.51	3.22	2.81	5.32	5.06	3.99	4.58	8.08	5.04	3.60	3.40
R	4.60	4.35	5.23	3.61	3.75	4.82	4.39	4.72	4.59	3.89	3.94	3.60	4.42
U	57.60	54.45	52.62	57.43	55.30	52.69	48.79	58.05	54.75	54.23	58.43	53.40	58.29
R + U	62.20	58.80	57.86	61.04	59.06	57.51	53.18	62.77	59.34	58.12	62.37	57.00	62.71
W	33.40	38.63	35.63	35.74	38.13	37.15	41.74	33.24	36.07	33.80	32.58	39.38	33.86
Dl_{10}	12.90	13.48	12.91	13.25	13.52	13.18	13.66	12.92	13.14	12.57	12.72	13.57	13.39
W/L·100	53.69	64.67	61.58	58.55	64.56	64.59	78.48	52.95	60.78	58.15	52.23	69.08	66.36
A/W·100	13.17	8.26	18.27	8.73	7.37	14.32	12.12	12.00	12.69	23.31	15.46	9.14	9.33
A/L ·100	7.07	5.35	11.25	5.27	4.75	9.25	9.57	6.30	7.71	13.90	8.08	6.31	6.19

Table 2 Frequency of basic types of main palm lines ABCD (%)

Traits	Örség	Milej-szeg	Kun-hegyes	Jász-apáti	Gacsály	Mező-kövesd	Takta-báj	Himód	Karcag	Gyön-gyös-tarján	Kis-falud	Szendrő	Kustán-szeg
	102	94	149	78	97	123	122	112	147	162	135	150	124
Types of line A:													
1 (+2)	7.00	10.55	9.49	14.19	11.17	13.09	10.12	10.14	15.26	9.06	7.85	6.66	4.11
3 (+4)	60.50	56.10	66.78	63.22	70.20	68.56	64.57	66.96	59.64	63.44	65.29	72.00	82.30
5 (5'+5"+6+7)	32.50	33.32	23.72	22.57	18.62	18.34	25.31	22.62	25.17	27.50	26.85	21.32	15.59
Types of line D:													
7 (+8 + X + 0)	19.00	17.21	15.92	10.96	13.84	17.97	13.94	17.19	15.50	11.96	13.41	16.32	20.16
9 (+10)	34.00	33.33	34.24	47.09	45.74	45.34	34.60	31.22	36.19	44.06	37.67	35.66	45.67
11 (+12 + 13)	47.00	49.43	49.73	41.93	40.42	36.68	51.46	51.59	48.27	44.37	48.86	47.99	34.15
Main line index of CUMMINS	8.52	8.49	8.29	8.32	8.27	7.88	8.35	8.14	8.34	8.41	8.39	8.26	7.86
Types of line C:													
Ulnar (4+5'+5''+6+7)	41.00	35.55	39.97	39.99	34.58	46.58	42.22	41.17	42.06	40.93	38.40	48.65	45.25
Radial (9+10+11+12+13)	40.00	39.44	39.38	38.70	48.08	37.90	35.01	37.59	33.45	38.12	42.18	38.00	42.79
Promixal (8+X)	13.50	18.88	13.88	11.61	12.73	11.44	12.65	11.76	13.44	14.68	12.31	8.99	5.35
Absence (0)	5.50	6.12	6.77	9.68	9.57	4.08	10.12	9.50	11.03	6.25	7.09	4.33	6.58
Types of line B:													
Distal (6 + 7 + 8 + 9)	59.50	57.77	62.03	60.64	62.23	50.55	58.22	57.91	63.77	56.89	57.45	60.66	51.42
Ulnar (3 + 4 + 5' + 5'')	40.50	42.21	37.28	38.70	37.23	49.44	41.76	42.07	36.20	42.80	42.53	38.95	48.55
X + 0	-	-	0.68	0.64	0.53	-	-	-	-	0.31	-	0.33	-

Table 3 Frequency of palmar patterns and accessory and axial triradii (%)

Traits	Örség	Milejszeg	Kunhegyes	Jászapáti	Gacsály	Mezőkövesd	Taktabáj	Himód	Karcag	Gyöngyöstarján	Kisfalud	Szendrő	Kustánszeg
	102	94	149	78	97	123	122	112	147	162	135	150	124
Palmar patterns:													
Hypothenar	31.00	33.33	31.86	30.32	32.97	38.37	28.27	28.05	29.92	28.66	34.04	25.33	36.21
Thenar/I	6.50	10.55	7.12	8.32	6.91	11.45	8.44	10.86	7.58	9.95	7.42	9.99	8.64
II	5.50	5.55	6.68	8.32	7.97	5.29	2.95	3.62	6.54	4.06	4.72	6.66	7.82
III	43.00	40.55	40.00	40.00	45.21	39.94	35.02	39.81	34.19	37.42	45.14	36.99	42.38
IV	47.50	50.00	47.52	49.67	46.81	58.42	51.05	45.24	50.61	51.37	37.31	56.33	52.67
Accessory triradii:													
II	5.50	5.55	6.78	8.32	7.97	5.29	2.95	3.62	6.54	4.06	4.72	6.66	7.82
III	2.00	1.11	1.35	1.28	4.12	0.40	-	1.81	0.69	0.62	0.37	-	0.82
IV	8.50	16.11	9.15	10.32	13.29	15.93	14.76	4.52	9.99	14.01	11.56	10.33	9.46
II + III + IV	16.00	22.77	17.28	19.92	25.38	21.62	17.71	9.95	17.23	18.69	16.65	16.99	18.10
Axial triradii:													
t	68.50	64.44	67.79	71.61	69.15	65.68	70.46	76.93	66.55	75.31	72.01	75.66	74.07
t'	15.00	13.33	16.61	19.35	18.08	15.12	18.14	18.14	22.05	13.75	15.29	15.99	9.84
t''	4.00	1.66	4.06	1.93	2.66	6.13	0.85	2.71	1.38	3.12	2.23	0.99	1.23
tt'	6.50	10.00	7.12	3.23	3.72	8.57	7.59	5.43	7.58	4.37	5.96	6.00	8.23
tt''	5.50	7.22	3.38	3.23	4.25	2.86	-	4.52	1.04	1.87	4.14	0.33	4.11
t't''	-	-	-	-	1.06	-	0.43	-	-	0.31	-	-	-
t t't''	-	-	-	-	0.53	0.41	-	-	-	0.31	-	-	0.41
0	0.50	3.33	0.01	0.64	-	0.82	2.53	2.26	1.38	0.94	0.37	1.00	1.23
t't'	-	-	-	-	0.53	0.41	-	-	-	-	-	-	-
t t	-	-	-	-	-	-	-	-	-	-	-	-	0.82

Table 4 Range of dermatoglyphical data of Hungarian males belonging to 13 local groups (%)

Traits	Minimum	Maximum
Finger patterns:		
A	2.8 (Gacsály)	8.1 (Gyöngyöstarján)
L	53.2 (Taktabáj)	62.8 (Himód)
W	32.6 (Kisfalud)	41.7 (Taktabáj)
Dl_{10}	12.57 (Gyöngyöstarján)	13.66 (Taktabáj)
Some types of main palm lines:		
Type 5 of line A	15.6 (Kustánszeg)	32.5 (Őrség)
Type 11 of line D	34.2 (Kustánszeg)	51.6 (Himód)
Main line index of Cummins	7.88 (Mezőkövesd)	8.52 (Őrség)
Radial type of line C	33.5 (Karcag)	48.1 (Gacsály)
Absence of line C (0)	4.1 (Mezőkövesd)	11.0 (Karcag)
Palmar patterns:		
Hypothenar	25.3 (Szendrő)	38.4 (Mezőkövesd)
Thenar/I	6.5 (Őrség)	10.9 (Himód)
Interdigital pads:		
II	2.9 (Taktabáj)	8.3 (Jászapáti)
III	34.2 (Karcag)	45.2 (Gacsály)
IV	37.3 (Kisfalud)	58.4 (Mezőkövesd)
Sum of accessory triradii:		
II + III + IV	9.9 (Himód)	25.4 (Gacsály)
Axial triradii:		
t	64.4 (Milejszeg)	76.9 (Himód)
t''	0.8 (Taktabáj)	6.1 (Mezőkövesd)

Fig. 2 The arrangement of the compared groups by 8 finger and palm traits (A, L, W, interdigital pads III and IV, Hy, 11 D, t): 1= Őrség, 2= Milejszeg, 3= Kunhegyes, 4= Jászapáti, 5= Gacsály, 6= Mezőkövesd, 7= Taktabáj, 8= Himód, 9= Karcag, 10= Gyöngyöstarján, 11= Kisfalud (GLADKOVA & TÓTH 1973, 1975, 1977, 1979), 12= Russians (PROKUDINA 1971), 13= Belorussians (ANTONIUK 1975), 14= Ossets (PETRENKO 1977), 15= Bashkirs (AKIMOVA 1972), 16= Avars (GADZHIEV 1962), 17= Andiicis and 18= Ginuchis (GLADKOVA & RAMAZANOV 1977), 19= Madzaris and 20= Asis (GLADKOVA & TÓTH 1970), 21= Finns (HIT 1969), 22= Lapps (KHAZANOVA 1971), 23= Mansis ivdelsky (GLADKOVA 1961), 24= KHANTS, r. Vach (GLADKOVA & HIT 1968), 25= Roumanians, Bran valley (VULPE 1972), 26= Lunigians, North-Italy (FORMICOLA 1975), 27= Hungarians, Budapest (MALÁN 1939, 1940), 28= Komis permyaki (GLADKOVA 1961), 29= Udmurts, Bashkiria (AKIMOVA 1972), 30= Svans (GLADKOVA 1958), 31= Hungarians from Szendrő and 32= Kustánszeg (our data).

Fig. 3 Group distribution by Cummins index (Ic) and delta index (Dl_{10}): 1= Őrség, 2= Milejszeg, 3= Kunhegyes, 4= Jászapáti, 5= Gacsály, 6= Mezőkövesd, 7= Taktabáj, 8= Himód, 9= Karcag, 10= Gyöngyöstarján, 11= Kisfalud (GLADKOVA & TÓTH 1973, 1975, 1977, 1979), 12= Szendrő and 13= Kustánszeg (our data), 14= Russians (PROKUDINA 1971), 15= Khazakhs (GLADKOVA 1964).

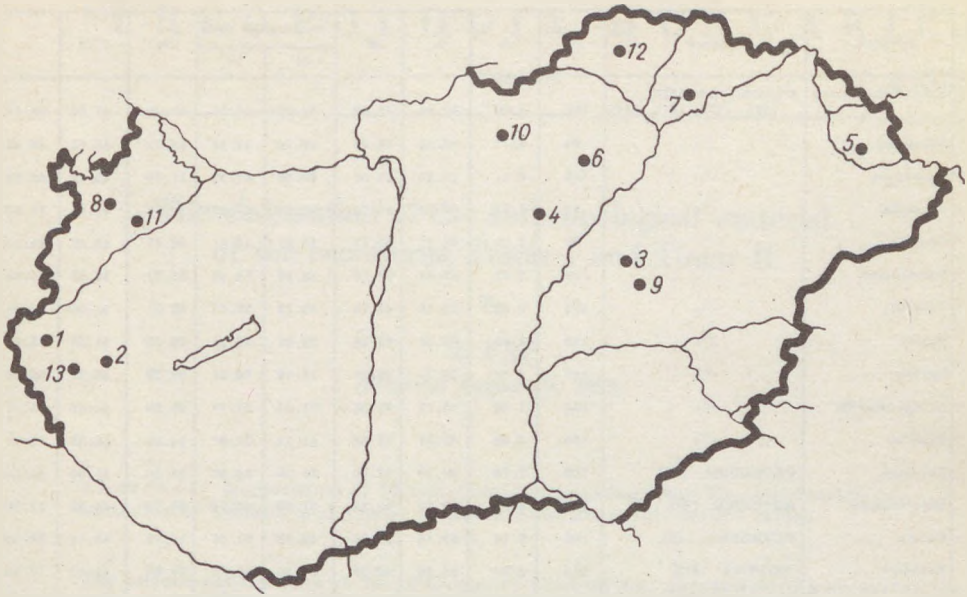
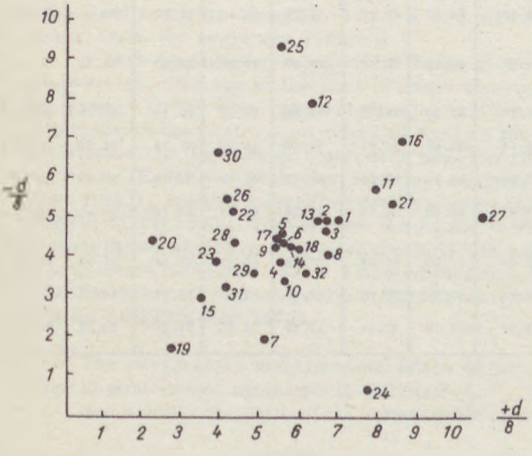


Fig. 1 Map of the distribution of the studied Hungarian groups: 1= Őrség, 2= Milejszeg, 3= Kunhegyes, 4= Jászapáti, 5= Gacsály, 6= Mezőkövesd, 7= Taktabáj, 8= Himód, 9= Karcag, 10= Gyöngyöstarján, 11= Kisfalud, 12= Szendrő, 13= Kustánszeg.

2



3

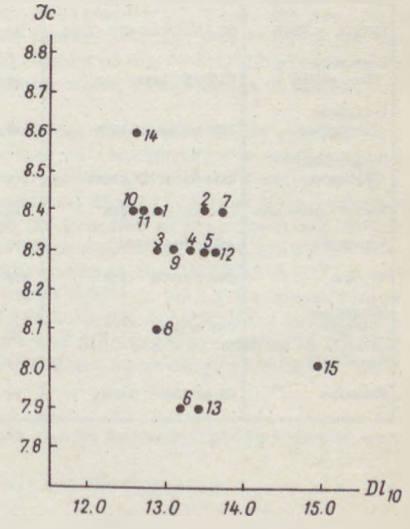


Table 5 Some dermatoglyphical traits of the different peoples (males) (%)

Peoples	Authors	n	A	L	W	Interdigital pads		Hy	11 D	t
						III	IV			
Hungarians: Őrség	GLADKOVA & TÓTH 1973, 1975, 1977, 1979	102	4.50	62.66	33.40	43.00	47.50	31.00	47.00	68.50
Milejszeg	-"-	94	3.15	58.80	38.63	40.55	47.52	33.33	49.43	64.44
Kunhegyes	-"-	149	6.51	57.86	35.63	40.00	47.52	31.86	49.43	67.79
Jászapáti	-"-	78	3.22	61.04	35.74	40.00	49.67	30.32	41.93	71.61
Gacsály	-"-	97	2.81	55.31	38.13	45.21	46.81	32.97	40.42	69.15
Mezőkövesd	-"-	123	5.32	57.51	37.15	39.94	58.42	38.37	36.83	65.68
Taktabáj	-"-	122	5.06	53.18	41.74	35.02	51.05	28.27	51.46	70.46
Himód	-"-	112	3.99	62.77	33.24	39.81	45.24	28.05	51.59	76.93
Karcag	-"-	147	4.58	59.34	36.07	34.19	50.61	29.22	48.27	66.55
Gyöngyöstarján	-"-	162	8.08	58.12	33.80	37.42	51.37	28.66	44.37	75.31
Kisfalud	-"-	135	5.04	62.37	32.58	45.14	37.31	34.08	48.86	72.01
Russians	PROKUDINA 1971	100	7.30	59.50	33.20	28.50	34.50	34.00	51.00	56.50
Belorussians	ANTONIUK 1975	200	4.60	60.20	35.20	37.50	49.75	36.25	46.00	63.50
Ossets	PETRENKO 1973	100	2.74	60.16	37.10	43.55	51.61	24.19	45.16	68.55
Bashkirs	AKIMOVA 1972	810	5.90	54.30	40.30	35.50	47.70	24.80	41.10	76.40
Avars	GADZHIEV 1962	114	4.83	54.73	39.47	58.32	36.74	36.84	46.51	55.63
Andiicis	GLADKOVA & RAMAZANOV 1977	85	3.18	61.35	35.46	37.04	59.87	30.86	30.86	70.37
Ginuchcis	-"-	70	5.57	53.28	41.14	39.28	43.57	35.71	46.42	69.28
Madzaris	GLADKOVA & TÓTH 1970	73	2.15	49.93	47.91	26.61	60.43	15.82	38.85	86.33
Asis	-"-	60	7.28	54.92	37.79	30.17	46.55	21.55	30.17	75.00
Finns	HIT 1969	746	8.10	64.10	27.80	46.80	48.70	26.90	53.50	67.80
Lapps	KHAZANOVA 1971	57	4.30	62.90	26.30	20.10	58.70	15.50	36.50	89.50
Mansis ivdelsky	GLADKOVA 1961	79	4.50	55.60	39.90	30.80	54.40	34.00	24.80	75.10
Khants, r. Vach	GLADKOVA & HIT 1968	40	2.70	45.00	52.30	48.30	46.70	35.10	50.00	96.70
Roumanians, Bran valley	VULPE 1972	57	2.22	66.85	30.93	28.75	56.14	37.72	28.07	40.35
Lunigians, North-Italy	FORMICOLA 1975	100	4.30	57.20	38.50	29.00	39.50	28.50	46.50	66.00
Hungarians, Budapest	MALÁN 1939, 1940	500	6.10	62.60	31.30	56.50	47.50	35.30	58.75	69.00
Komis - permyaki	GLADKOVA 1961	66	9.16	56.02	34.81	24.59	55.73	37.79	24.52	78.69
Udmurts	AKIMOVA 1972	75	5.00	58.20	36.80	40.70	42.70	30.70	36.60	80.00
Svans	GLADKOVA 1958	222	5.03	60.40	34.57	33.86	44.23	27.16	31.03	56.25
Hungarians: Szendrő	Our data	150	3.60	57.00	39.38	36.99	56.33	25.33	47.99	75.66
Kustánszeg	-"-	124	3.40	62.71	33.86	42.38	52.67	36.21	34.15	74.07
Khazakhs	GLADKOVA 1964	84	2.74	45.12	52.14	25.88	51.00	24.57	34.05	84.44

ANTHROPOLOGIA HUNGARICA

XVIII. 1982-1983 p. 53—64

The elaboration of the anthropological material of the cemeteries Tímár I and Tímár II

By

I. PAP

(Received August 19, 1983)

Abstract. Elaboration of 46 individuals originating from the 10th century cemeteries of Tímár I and Tímár II (North-East Hungary). With 7 tables.

The rescue excavations of the 10th century cemeteries, exposed during an earthwork carried out in the farmstead of the "Béke" co-operative of Tímár, took place as a part of the research project of the bailiff center of Szabolcs. 41 graves were rescued from an estimated 100-150 in the cemetery Tímár I and 6 graves from the almost completely destroyed cemetery Tímár II, which is about 150 metres to the south-west of the former (KOVÁCS 1976).

The anthropological material is registered under inventory numbers 71.9.1 - 71.9.25, 79.1.1 - 79.1.15 (cemetery No. I) and 71.10.1 - 71.10.6 (No. II) in the Anthropological Department of the Hungarian Natural History Museum.

During examination the bone material of 46 individuals was treated from the material of the above-mentioned graves. There were 27 grown-ups (14 males, 13 females), 10 children and juveniles and 3 undeterminable individuals from the cemetery No. I. Owing to the bad preservation of the skulls only one male and two female skulls could be measured. Nevertheless I could analyse the secondary taxonomical characters still. From the material of 6 graves of the cemetery No. II only one male and one female cranium was suitable for measurement. I was able to investigate the postcranial skeletons of the 20 individuals (11 males, 9 females) from the cemetery Tímár I and the long bones of the 5 individuals (3 males, 2 females) from the cemetery Tímár II.

I have identified the sex on the basis of the anatomical characters of the cranium and the skeleton. The age at the time of death was determined by considering the ossification of the sutures on the endo- and ectocranial surface of the cranium and the ossification of the epiphyses on the postcranial bones as well as the superficial change of the facies symphyseos ossis pubis. In the case of children I have considered the eruption of permanent and deciduous teeth (FARKAS 1972). The metrical analysis was taken according to the MARTIN-technique (1928), special facial flatness data were taken according to the DEBETS & TÓTH method (in TÓTH 1958). I have used the ALEXEYEV-method (1966) in taking the measurements of postcranial skeleton. I applied the MARTIN and MANOUVRIER & VERNEAU index system of long bones (MARTIN 1928). I determined the stature and the weight according to DEBETS & DUERNOVO (1971), while the quadratic weight stature index according to DEBETS' method (in LOTTERHOF 1978).

The parameters and characteristics of the crania can be found in Tables 1 and 2, and those of postcranial skeletons in Tables 3-5.

Some additional data of the measurable individuals are the following:

Cemetery of TIMÁR I: Grave 2 - Thickening caused by inflammation on the diaphyses of ulnae. - Grave 6 - Caudal sacrum bifidum. - Grave 8 - A large-sized exostosis on humeri, above the tuberositas deltoidea, continuously of the crista tuberculi majoris, in the opposite direction of the caput humeri. - Grave 9 - Both sides of perforatio fossae olecrani humeri. - Grave 10 - Both sides of perforatio fossae olecrani humeri, cranial sacrum bifidum. - Grave 13 - Both sides of perforatio fossae olecrani humeri. - Grave 18 - Osteoma of small size (12 mm x 5 mm) on the occipital bone, on the linea nuchae inferior. - Grave 24 - On the level of the absent 1st molar on the left side of the torus palatinus of maxillae there is a hole (4 mm in diameter) leading into the sinus maxillaris. Fractura completa with dislocatio on the right tibia. - Grave 26 - Fractura completa with dislocation the left tibia. - Grave 27 - There is a hole (5 mm in diameter) on the level of the linea glutea inferior on the right os pubis.

Cemetery of TÍMÁR II: Grave 1 - Both sides of perforatio fossae olecrani humeri. - Grave 3 - There is a bone hunch (6 mm in diamater) on the right side of os occipitale, on the level of linea nuchae inferior.

The characteristics of the non-measurable material are in Tables 6 and 7.

GENERAL CHARACTERIZATION

The five measurable skulls from the two cemeteries do not make it possible to characterize the populations of Tímár or to compare them to other series.

The taxonomically evaluable male skull is Cromagnoid and the two female ones are of Mediterranean character.

The analysis of skeletal bones reveals that eurybrachia is characteristic for the majority of humeri. The ulnae are platolen. Femora have weak pilaster or no pilasters at all, they are eurymer in the majority. Tibiae are euryknem or mesoknem.

The analysable finds of the two cemeteries of Tímár cannot be separated anthropologically. This can be attributed to the fact that none of these materials represents the population of the cemeteries of Tímár either from qualitative or quantitative points of view.

REFERENCES

ALEXEYEV, V.P. (1966): Osteometria. Metodika anthropologitsheskih isledovaniy. - Moskva: 251 pp. (in Russian).

DEBETS, G.F. & DUERNOVO, Yu.A. (1971): (Long bones from Eneolithic burial grounds in Turkmenia). - Sov. Arh. 1: 26-35 (in Russian).

FARKAS, Gy. (1972): Paleoantropológiai metodikák [Anthropological practice]. - Szeged: 28-66. (in Hungarian).

KOVÁCS, L. (1976): Ausgrabungen der Gräberfelder des ungarischen gemeinen Volkes in Szabolcs und Tímár. - Acta arch. hung. 28: 383-389.

LOTTERHOF, E. (1978): On the problem of gracilization in the Central Danubian Basin, III. - Annls hist.-nat. Mus. natn. hung. 70: 369-371.

MARTIN, R. (1928): Lehrbuch der Anthropologie. II. - Jena: 579-1182 pp.

TÓTH, T. (1958): Profilation horizontale du crâne facial de la population ancienne et contemporaine de la Hongrie. - Crania hung. 3: 3-126.

Author's address: DR. ILDIKÓ PAP

Anthropological Department
Hungarian Natural History Museum
Budapest, Bajza utca 39.
H-1062

Table 1 Parameters of facial flatness - Tímár I

Characteristics	9	13
	M/Ad.	F/Ad.
MC	15.5	20.5
MS	7.4	6.0
BC	101.0	90.5
BS	20.0	15.5
NA	136.8	142.0
ZC	97.0	88.5
ZS	24.5	24.0
ZA	126.3	123.1
DC	19.0	23.0
DS	10.4	9.0
DI	54.7	39.1
SC	7.0	13.0
SS	5.0	5.0
SI	71.4	38.5
C	51.0	-
S	9.6	-
S: C	18.8	-
FC	3.0	4.0
IMMC	-	23.0
IMMS	-	8.0
IMM index	-	34.8

M = Male, F= Female

Table 2 Individual cranial measurements and indices - Tímár I and Tímár II

MARTIN No	Tímár I			Tímár II	
	9	7	13	1	2
	M/Ad.	F/Mat.	F/Ad.	M/Ad.	F/Ad.
1	175	173	160	189	169
1c	174	170	162	189	170
5	-	-	-	-	-
7	-	-	-	-	-
8	144	-	128	150	137
9	96	-	95	100	85
10	128	-	112	127	109
11	126	123	119	(127)	118
12	111	106	104	(114)	108
16	-	-	-	-	-
17	-	-	-	-	-
20	118	113	114	115	107
23	-	-	-	-	-
24	-	-	-	-	-
25	355	353	-	-	-
26	134	126	112	134	121
27	117	110	116	135	120
28	104	117	-	-	-
29	115	109	100	117	107
30	111	95	102	119	107
31	88	97	-	-	-
32	89	-	-	-	-
32-	82	-	-	-	-
40	-	-	-	-	-
43	108	-	102	-	-
45	136	-	-	-	-
46	96	-	90	-	-
47	100	-	105	-	-
48	65	67	62	-	-
51	46	38!	41	-	-
51a	43	36!	38	-	-
52	32	34!	29	-	-
54	26	-	24	-	-
55	51	51!	48	-	-
62	40	-	-	-	-
63	40	-	40	-	-
65	120	-	107	-	-
66	104	-	94	-	86
68	73	-	73	-	-
68(1)	54	-	57	-	-
69	21	23	21	-	20
70	59	-	62	-	63
71a	28	-	28	-	31
72	92	-	-	-	-
73	93	-	-	-	-
74	87	-	-	-	-
75	58	-	-	-	-
75(1)	34	-	-	-	-
79	117	-	122	-	-
8:1	82.29	-	80.00	79.37	81.07
17:1	-	-	-	-	-
17:8	-	-	-	-	-
9:8	66.67	-	74.22	66.67	62.04
47:45	73.53	-	-	-	-
48:45	47.79	-	-	-	-
52:51	69.57	89.47!	70.73	-	-
54:55	50.98	-	50.00	-	-
63:62	100.00	-	-	-	-

! = on the right side M= Male, F= Female

Table 3

Parameters of long bones - Tímár I, males

Characteristics		1	3	4	6	9	11	17	24	26	27	33
Humerus 1	L	-	-	-	-	302	-	-	-	-	-	-
	R	-	-	-	-	301	-	-	-	-	-	-
2	L	-	-	-	-	300	-	-	-	-	-	-
	R	-	-	-	-	299	-	-	-	-	-	-
3	L	-	-	-	-	48	-	-	-	-	-	-
	R	-	-	-	-	-	-	-	-	-	-	-
4	L	-	-	-	67	51	-	-	59	-	-	-
	R	-	-	-	64	63	-	-	-	-	-	-
5	L	20	-	-	24	22	-	20	22	24	23	-
	R	-	-	-	26	23	-	-	23	25	23	24
6	L	17	-	-	18	18	-	17	20	18	20	-
	R	-	-	-	18	18	-	-	18	20	20	20
7	L	60	-	-	64	60	-	57	63	64	64	-
	R	-	-	-	66	62	-	-	64	66	68	66
7a	L	62	-	-	69	65	-	59	67	70	70	-
	R	-	-	-	74	67	-	-	67	73	70	69
9	L	-	-	-	-	-	-	-	-	-	-	-
	R	-	-	-	-	-	-	-	-	-	-	-
6:5	L	85.00	-	-	75.00	81.82	-	85.00	90.91	75.00	86.96	-
	R	-	-	-	69.23	76.09	-	-	80.00	80.00	86.96	83.33
7:1	L	-	-	-	-	19.87	-	-	-	-	-	-
	R	-	-	-	-	20.60	-	-	-	-	-	-
Radius 1	L	-	-	-	-	-	-	-	-	-	-	-
	R	-	-	-	-	234	-	-	-	-	-	-
2	L	-	-	-	-	220	-	-	-	-	-	-
	R	-	-	-	-	219	-	225	-	-	241	-
4	L	-	-	-	-	17	-	13	16	-	16	-
	R	-	-	-	16	16	-	13	18	18	17	-
5	L	-	-	-	-	11	-	11	12	-	13	-
	R	-	-	-	13	12	-	10	12	12	12	-
3	L	-	-	-	-	43	-	36	-	-	41	-
	R	-	-	-	43	41	-	35	42	42	43	-
5:4	L	-	-	-	-	64.71	-	84.62	74.19	-	81.25	-
	R	-	-	-	81.25	75.00	-	76.92	68.57	66.67	70.59	-
3:2	L	-	-	-	-	19.55	-	-	-	-	-	-
	R	-	-	-	-	18.72	-	16.89	-	-	17.84	-
3:1	L	-	-	-	-	-	-	-	-	-	-	-
	R	-	-	-	-	17.52	-	-	-	-	-	-
Ulna 1	L	-	-	-	-	-	-	-	-	-	-	-
	R	-	-	-	-	257	-	-	-	-	-	-
2	L	-	-	-	-	225	-	-	-	-	-	-
	R	-	-	-	-	226	-	-	-	-	-	-
11	L	-	-	-	-	14	-	-	-	-	12	-
	R	-	-	-	14	14	-	-	13	-	-	-
12	L	-	-	-	-	15	-	-	-	-	19	-
	R	-	-	-	17	16	-	-	17	-	-	-
13	L	-	-	-	20	22	-	-	-	-	-	-
	R	-	-	-	20	22	-	20	20	-	-	-
14	L	-	-	-	26	27	-	-	-	-	25	-
	R	-	-	-	25	28	-	25	29	-	-	-
3	L	-	-	-	-	34	-	-	-	-	37	-
	R	-	-	-	-	36	-	-	-	-	-	-
3:2	L	-	-	-	-	15.11	-	-	-	-	-	-
	R	-	-	-	-	15.93	-	-	-	-	-	-
11:12	L	-	-	-	-	93.33	-	-	-	-	63.16	-
	R	-	-	-	82.35	87.50	-	-	76.47	-	-	-
13:14	L	-	-	-	78.43	79.63	-	-	-	-	-	-
	R	-	-	-	80.00	78.57	-	80.00	68.97	-	-	-

Table 3 (continued)

Characteristics			1	3	4	6	9	11	17	24	26	27	33
Femur	1	L	-	-	-	-	420	-	-	447	-	-	-
		R	-	-	-	-	417	-	-	-	-	-	-
	2	L	-	-	-	-	416	-	-	441	-	-	-
		R	-	-	-	-	414	-	-	-	-	-	-
	21	L	-	-	-	-	77	-	-	-	-	-	-
		R	-	-	-	-	-	-	-	-	-	-	-
	6	L	-	-	27	28	21	-	24	29	-	32	26
		R	-	-	26	28	26	-	23	29	-	29	26
	7	L	-	-	28	27	27	-	23	27	-	30	29
		R	-	-	29	28	26	-	25	28	-	33	32
	9	L	-	-	28	32	33	-	33	32	35	34	-
		R	-	-	27	34	34	-	31	32	-	33	-
	10	L	-	-	33	29	28	-	27	31	-	32	-
		R	-	-	35	29	29	-	29	30	-	30	-
	8	L	-	-	83	88	83	-	76	88	-	98	88
		R	-	-	85	88	81	-	76	-	-	97	92
	8: 2	L	-	-	-	-	19.95	-	-	19.95	-	-	-
		R	-	-	-	-	19.57	-	-	-	-	-	-
	6: 7	L	-	-	96.43	103.70	77.78	-	104.35	107.41	-	106.67	89.66
		R	-	-	111.54	98.21	100.00	-	92.00	103.57	-	87.88	81.25
	10: 9	L	-	-	117.86	90.63	86.15	-	81.82	95.31	-	92.65	-
		R	-	-	127.78	85.29	85.29	-	93.55	93.75	-	90.91	-
Tibia	1	L	-	-	-	-	328	-	-	-	-	-	-
		R	-	-	-	-	330	319	-	-	-	-	-
	2	L	-	-	-	-	339	-	-	-	-	-	-
		R	-	-	-	-	336	321	-	-	-	-	-
	1a	L	-	-	-	-	339	-	-	-	-	-	-
		R	-	-	-	-	342	329	-	-	-	-	-
	5	L	-	-	-	-	-	-	-	-	-	-	-
		R	-	-	-	-	-	-	-	-	-	-	-
	6	L	-	-	-	-	-	-	-	-	-	-	-
		R	-	-	-	-	-	48	-	-	-	-	-
	8	L	-	27	27	29	29	-	26	32	-	30	28
		R	-	27	27	28	28	25	27	-	-	32	28
	8a	L	-	29	28	32	32	-	32	35	-	34	32
		R	-	30	31	30	32	28	31	-	-	39	32
	9	L	-	20	18	21	21	-	20	19	-	22	22
		R	-	20	19	21	21	17	19	-	-	20	21
	9a	L	-	21	19	23	21	-	23	22	-	22	23
		R	-	22	20	22	23	19	21	-	-	22	22
	10	L	-	76	72	79	78	-	74	82	-	84	80
		R	-	76	72	77	78	68	75	-	-	85	82
	10b	L	-	69	65	73	70	-	66	72	-	75	70
		R	-	69	65	70	71	61	68	-	-	77	70
	9a: 8a	L	-	72.41	67.86	71.88	64.66	-	71.88	62.86	-	64.71	71.88
		R	-	74.58	64.52	73.33	71.88	67.86	87.74	-	-	56.41	68.75
	10b: 1	L	-	-	-	-	21.34	-	-	-	-	-	-
		R	-	-	-	-	21.52	19.12	-	-	-	-	-

Table 4 Parameters of long bones - Tímár I, females

Characteristics			2	7	8	10	13	15	18	28	41
Humerus	1	L	-	-	-	-	-	-	-	-	-
		R	-	297	-	-	-	-	-	-	-
	2	L	-	-	-	-	-	-	-	-	-
		R	-	290	-	-	-	-	-	-	-
	3	L	-	-	-	-	-	-	-	-	-
		R	-	47	-	-	-	-	-	-	-
	4	L	-	-	-	58	-	-	-	-	-
		R	-	-	-	-	-	-	-	-	-
	5	L	20	-	18	17	19	-	21	-	-
		R	20	22	18	18	19	-	20	19	-
	6	L	15	-	14	16	15	-	18	-	-
		R	15	16	15	17	14	-	17	15	-
	7	L	56	-	50	51	51	-	59	-	48
		R	54	58	53	52	53	-	58	53	50
	7a	L	57	-	53	52	56	-	63	-	-
		R	56	62	54	55	56	-	61	57	-
	9	L	-	-	-	-	-	-	-	-	-
		R	-	40	-	-	-	-	-	-	-
	6:5	L	75.00	-	77.78	91.76	78.38	-	85.71	78.95	-
		R	75.00	72.73	83.33	91.67	73.68	-	85.00	-	-
	7:1	L	-	-	-	-	-	-	-	-	-
		R	-	19.53	-	-	-	-	-	-	-
Radius	1	L	-	-	-	-	-	-	-	-	-
		R	-	-	-	-	227	-	-	-	-
	2	L	206	-	208	-	-	-	-	-	195
		R	-	-	207	-	214	-	-	-	-
	4	L	14	-	19	14	14	14	15	-	13
		R	14	-	14	-	13	15	14	-	13
	5	L	10	-	10	10	11	10	11	-	10
		R	10	-	10	-	10	10	10	-	10
	3	L	36	-	35	35	38	37	37	-	33
		R	35	-	37	-	37	37	38	-	33
	5:4	L	71.43	-	54.05	74.07	75.00	71.43	73.33	-	76.92
		R	71.43	-	74.07	-	76.92	66.67	71.43	-	76.92
	3:2	L	17.48	-	17.79	-	-	-	-	-	16.92
		R	-	-	17.87	-	17.29	-	-	-	-
	3:1	L	-	-	-	-	-	-	-	-	-
		R	-	-	-	-	16.30	-	-	-	-
Ulna	1	L	-	-	-	-	-	-	-	-	-
		R	-	-	-	-	-	-	-	-	-
	2	L	-	-	-	-	-	218	-	-	-
		R	-	-	214	-	219	-	-	-	-
	11	L	-	-	11	10	12	10	11	-	-
		R	-	-	11	-	11	10	-	-	-
	12	L	-	-	15	13	13	12	15	-	-
		R	-	-	15	-	12	13	-	-	-
	13	L	-	-	18	19	16	16	-	19	-
		R	-	-	16	-	17	17	-	-	-
	14	L	-	-	21	24	24	21	-	14	-
		R	-	-	21	-	20	23	-	-	-
	3	L	-	-	32	28	33	27	32	-	-
		R	-	-	31	-	32	28	-	-	-
	3:2	L	-	-	-	-	-	12.39	-	-	-
		R	-	-	14.49	-	14.61	-	-	-	-
	11:12	L	-	-	73.33	76.92	92.31	83.33	73.33	-	-
		R	-	-	73.33	-	91.67	76.92	-	-	-
	13:14	L	-	-	85.71	79.17	66.67	76.19	-	79.17	-
		R	-	-	76.19	-	85.00	73.91	-	-	-

Table 4 (continued)

Characteristics			2	7	8	10	13	15	18	28	41
Femur	1	L	-	-	400	-	423	411	-	-	-
		R	-	-	397	-	-	407	-	-	-
	2	L	-	-	394	-	419	409	-	-	-
		R	-	-	393	-	-	406	-	-	-
	21	L	-	-	-	-	-	-	-	-	-
		R	-	-	-	-	-	-	-	-	-
	6	L	-	-	23	27	23	25	24	-	-
		R	-	-	23	26	23	24	22	-	-
	7	L	-	-	24	25	24	26	23	-	-
		R	-	-	24	23	23	25	23	-	-
	9	L	-	-	27	30	30	32	30	35	29
		R	-	-	31	31	29	33	-	36	29
	10	L	-	-	23	25	27	26	29	27	21
		R	-	-	22	29	26	27	-	29	23
	8	L	-	-	75	80	74	78	75	-	-
		R	-	-	73	79	73	77	74	-	-
	8: 2	L	-	-	19.04	-	17.66	19.07	-	-	-
		R	-	-	18.58	-	-	18.97	-	-	-
	6: 7	L	-	-	95.83	108.00	95.83	96.15	104.35	-	-
		R	-	-	97.87	113.04	100.00	96.00	95.65	-	-
	10: 9	L	-	-	85.19	83.33	90.00	81.25	96.67	77.14	72.41
		R	-	-	70.97	93.55	89.66	81.82	-	80.56	79.31
Tibia	1	L	-	-	321	-	-	-	-	-	-
		R	-	-	315	-	-	-	-	-	-
	2	L	-	-	331	-	-	-	-	-	-
		R	-	-	323	-	-	-	-	-	-
	1a	L	-	-	332	-	-	320	-	-	-
		R	-	-	328	-	-	-	-	-	-
	5	L	-	-	-	-	-	-	-	-	-
		R	-	-	-	-	-	-	-	-	-
	6	L	-	-	49	-	-	-	-	-	-
		R	-	-	47	-	-	-	-	-	-
	8	L	-	-	25	27	24	25	-	-	26
		R	-	-	27	26	23	24	-	-	27
	8a	L	-	-	27	30	27	26	-	-	28
		R	-	-	28	30	28	27	-	-	29
	9	L	-	-	18	21	20	19	-	-	17
		R	-	-	20	21	18	17	-	-	17
	9a	L	-	-	20	20	21	19	-	-	18
		R	-	-	20	22	20	19	-	-	18
	10	L	-	-	67	77	69	68	-	-	69
		R	-	-	72	76	67	67	-	-	78
	10b	L	-	-	62	68	61	59	-	-	63
		R	-	-	64	71	-	59	-	-	-
	9a: 8a	L	-	-	74.07	66.67	75.93	73.08	-	-	64.29
		R	-	-	71.43	72.33	71.43	70.37	-	-	62.07
	10b: 1	L	-	-	19.31	-	-	-	-	-	-
		R	-	-	20.32	-	-	-	-	-	-

Table 5 Parameters of long bones - Tímár II, males and females

Characteristics			1	3	5	2	6
			M	M	M	F	F
Humerus	1	L	-	-	-	-	-
		R	-	-	-	-	-
	2	L	-	-	-	-	-
		R	-	-	-	-	-
	3	L	-	-	-	-	-
		R	-	-	-	-	-
	4	L	-	-	-	-	-
		R	-	-	-	-	-
	5	L	23	23	-	18	15
		R	24	-	-	18	15
	6	L	19	19	-	12	18
		R	21	-	-	12	19
	7	L	63	63	-	47	52
		R	67	-	-	51	53
	7a	L	65	68	-	49	55
		R	69	-	-	48	57
	9	L	-	-	-	-	-
		R	-	-	-	-	-
	6:5	L	82.22	82.61	-	68.57	83.33
		R	85.42	-	-	66.67	78.95
	7:1	L	-	-	-	-	-
		R	-	-	-	-	-
Radius	1	L	-	-	-	-	-
		R	-	-	-	-	-
	2	L	-	244	-	-	-
		R	-	-	-	-	-
	4	L	15	17	15	13	14
		R	16	-	16	12	14
	5	L	12	13	13	10	10
		R	12	-	13	10	9
	3	L	39	43	42	34	35
		R	41	-	42	33	35
	5:4	L	79.31	76.47	86.67	73.08	71.41
		R	77.42	-	83.87	79.17	64.29
	3:2	L	-	17.62	-	-	-
		R	-	-	-	-	-
	3:1	L	-	-	-	-	-
		R	-	-	-	-	-
Ulna	1	L	-	-	-	-	-
		R	-	-	-	-	-
	2	L	-	-	-	-	-
		R	-	-	-	-	-
	11	L	12	12	12	11	-
		R	12	-	13	11	-
	12	L	17	18	18	13	15
		R	16	-	19	13	14
	13	L	19	19	26	16	-
		R	20	-	20	17	-
	14	L	24	32	27	18	12
		R	27	-	28	19	11
	3	L	37	35	-	28	-
		R	-	-	36	29	28
	3:2	L	-	-	-	-	-
		R	-	-	-	-	-
	11:12	L	69.70	66.67	68.57	84.00	-
		R	75.00	-	64.86	84.62	-
	13:14	L	77.55	59.38	98.11	86.11	-
		R	74.07	-	71.43	86.84	-

Table 5 (continued)

Characteristics			1	3	5	2	6
			M	M	M	F	F
Femur	1	L	448	-	-	-	-
		R	-	-	-	-	422
	2	L	-	-	-	-	-
		R	-	-	-	-	417
	21	L	-	-	-	-	-
		R	-	-	-	-	-
	6	L	29	-	-	25	23
		R	29	-	32	25	22
	7	L	26	-	-	24	27
		R	26	-	30	24	24
	9	L	35	40	36	29	36
		R	32	-	34	-	36
	10	L	28	29	31	20	26
		R	27	-	29	-	25
	8	L	86	-	-	77	79
		R	84	-	97	-	72
	8: 2	L	-	-	-	-	-
		R	-	-	-	-	17.27
	6: 7	L	111.54	-	-	104.17	117.39
		R	111.54	-	101.61	104.17	109.09
	10: 9	L	80.00	72.50	86.11	68.97	72.22
		R	84.38	-	85.29	-	69.44
Tibia	1	L	-	-	-	-	-
		R	-	-	-	-	330
	2	L	-	-	-	-	-
		R	-	-	-	-	317
	1a	L	-	-	-	-	-
		R	-	-	-	-	319
	5	L	-	-	-	-	-
		R	-	-	-	-	-
	6	L	-	-	-	-	-
		R	-	-	-	-	-
	8	L	-	-	31	25	29
		R	-	-	30	-	-
	8a	L	-	-	36	26	30
		R	-	-	35	-	-
	9	L	-	-	25	17	16
		R	-	-	23	-	-
	9a	L	-	-	27	19	18
		R	-	-	29	-	-
	10	L	-	-	90	68	70
		R	-	-	86	-	-
	10b	L	-	-	78	60	65
		R	-	-	-	-	-
	9a: 8a	L	-	-	76.06	73.08	60.00
		R	-	-	82.86	-	-
	10b: 1	L	-	-	-	-	-
		R	-	-	-	-	-

Table 6 Characterization of the fragmentary material - Tímár I

Grave No	Characterization	Sex	Age
1	Incomplete skeletal bones. Status post fracturam on the left clavicula	M	Mat.
2	Incomplete, fragmentary cranium with mandible. Norma verticalis: pentagonoid. Prot. occ. ext.: 2, proc.mast.: 1.	F	Ad.
3	Skeletal bone fragments.	M	Ad.
5	Cranium and skeletal bone fragments.	M	Ad.
6	Incomplete fragmentary cranium with mandible. Prot. occ. ext.: 3, proc. mast.: 3. Ossa wormiana on the sutura lambdoidea.	M	Mat.
7	Incomplete skeletal bones.	F	Mat.
8	Skull fragments, mandible. Proc. mast.: 1. Ossa wormiana on the suturae lambdoidea and sagittalis.	F	Ad.
11	Incomplete skeletal bones.	M	Ad.
12	Skeletal bone fragments.	-	Inf. I.
14	Incomplete cranium. Stenokrotaphia. Incomplete skeletal bones. Block vertebra of the 4th and 5th cervical vertebra. Caudal sacrum bifidum.	-	Juv.
16	Incomplete cranium with mandible. Right os epipericum. Incomplete skeletal bones.	-	Juv.
17	Skull framents with mandible. Glabella: 3, arcus superciliaris: 3, prot. occ. ext.: 1, proc. mast.: 3.	M	Ad.
18	Fragmentary incomplete cranium with mandible. Glabella: 2, arcus superciliaris: 3, proc. occ. ext.: 2.	F	Ad.
19	Skull fragments.	-	Inf. II.
21	Skeletal bone fragments.	-	Inf. I.
22	Cranium and skeletal bone fragments.	-	Inf. I.
23	Cranium and skeletal bone fragments.	-	Inf. I.
24	Fragmentary cranium with mandible. Norma verticalis: ovoid, arcus superciliaris: 3, proc. mast.: 3, lower edge of apertura piriformis: anthropine, spina nasalis ant.: 4, alveolar prognathy: 3.	M	Sen.
25	Cranium and skeleton fragments.	-	Inf. I.
26	Cranium fragments. Proc. mast.: 1. Atrophied alveoli of the molares.	M	Mat.

Table 6 (continued)

Grave No	Characterization	Sex	Age
27	Calotte fragments. Glabella: 5, arcus superciliaris: 3, proc. mast.: 3.	M	Sen.
28	Calotte fragments. Norma verticalis: ovoid, glabella: 2, prot. occ. ext.: 1, proc. mast: 1. Incomplete skeleton.	F	Ad.
29	Calotte fragments.	-	Inf. I.
30	Calotte fragments. Atrophied alveoli of the incisivi and the molares of the mandible. Incomplete skeleton fragments.	M	Mat.
31	Skeleton fragments.	Undeterminable (grown-up)	
32	Calotte and skeleton fragments.	F	Ad.
33	Calotte and skeleton fragments. Exostosis on the right humerus, under the tuberositas deltoidea.	M	Mat.
34	Skeleton fragments.	Undeterminable	
35	Calotte, mandible and skeleton fragments.	M	Mat.
36	Calotte, mandible and skeleton fragments.	F	Ad.
37	Skeleton fragments.	Undeterminable	
38	Skeleton fragments.	F	Ad.
39	Skeleton fragments.	-	Inf. (II.?)
40	Calotte and skeleton fragments. Glabella: 0, arcus superciliaris: 2.	F	Ad.

Table 7 Characterization of the fragmentary material - Tímár II

Grave No	Characterization	Sex	Age
3	Incomplete, fragmentary cranium with mandible. Prot. occ. ext.: 3, proc. mast.: 3.	M	Ad.
4	Fragmentary, incomplete cranium with mandible. Arcus superciliaris: 3, proc. mast.: 2, fossa canina: 2. Initial and advanced atrophy in place of the molars of the mandible. Incomplete skeletal bones.	M	Mat.
6	Fragmentary cranium with mandible. Arcus superciliaris: 3, prot. occ. ext.: 0, proc. mast.: 1.	F	Mat.

A N T H R O P O L O G I A H U N G A R I C A

XVIII. 1982-1983 p. 65—74

Anthropological investigation of a postcranial series from the Arpadian age (Nagykőrös, Hungary)

By

I. PAP

(Received December 1, 1983)

Abstract. The author examines the postcranial material of the cemeteries of Nagykőrös (plain between the rivers Danube and Tisza). With 3 tables.

In my previous paper I examined the cranial material of the cemeteries originating from the environs of Nagykőrös (PAP 1978-1979). The excavations were led by Béla BALANYI in 1958, 1959, 1960 and 1965. I think it is important to study and to publish the postcranial skeletons as well.

MATERIAL AND METHOD

Out of the excavated material, the long bones of 26 grown-ups were suitable for anthropological investigation. 15 of them are males and 11 are females. The material is moderately well preserved.

I determined the age at the time of death by investigating the endo- and ectocranial ossification of suturae and epiphyses, the surface changing of the facies symphyseos ossis pubis. In the determination of the sex I heavily relied upon both the cranial and postcranial characters (FARKAS 1972). In taking absolute measurements I followed the ALEXEYEV-technique (1966). The stature and the weight were calculated according to DEBETS & DUERNOVO (1971), the quadratic weight-stature index was calculated as per DEBETS (in LOTTERHOF 1978). The stature and indices were classified according to MARTIN's and MANOUVRIER & VERNEAU's categories (MARTIN 1928, MARTIN & SALLER 1957).

GENERAL ANTHROPOLOGICAL ANALYSIS

The parameters of long bones are given in Table 1, the individual measurements and indices of males in Table 2, and those of females in Table 3.

Both sides of humeri of males are platybracher, those of females are eurybracher. Both sides of male humeri and the right female humeri are medially gracile. The left female humeri are gracile. The right radii are more gracile than the left ones both in males and females. The male ulnae are eurolen, the female ones are platolen. The right male and the left female ulnae are more gracile than the contralateral ulnae. The male femora are without pilaster those of female are with weak pilaster. Both sides of male and the right female femora are platymer, the left female ones are hyperplatymer. The left femora are more gracile than the right ones, both in males and females. The male and female tibiae are eurycnem on both sides. The female tibiae are more round than the male ones. The tibiae of fe-

males are more gracile than those of the males. It is obvious that all female long bones are more gracile and more round on the right side than on the left. The male right humeri, ulnae and tibiae are more gracile and flater than the left ones. The right radii and femora of the males are more robust and more round than the left ones.

The stature of males are medium tall (165.32 cm) and that of female are big-medium tall (157.30 cm), according to the averages. The mean value of the weight of males is 64.67 kg and that of females is 58.55 kg.

ANATOMICAL VARIATIONS AND ABNORMALITIES

Caudal sacrum bifidum occurred in 8 cases. It was observed on 6 male and 2 female sacri. Complete sacrum bifidum occurred on one male sacrum. Perforatio fossae olecrani humeri was detected in 3 cases (2 females, 1 male). Both sides of perforatio fossae olecrani humeri were seen on one female humerus. I observed sacralisatio on 2 male and 1 female skeletons.

PATHOLOGICAL CHANGES

Spondylosis was detected only on male skeletons (6 cases). Owing to the diseases of articulations an intense arthrosis deformans occurred on the facies articularis of the hip-bone, on the ramus inferior ossis pubis and on the left caput femoris of one male (Inventory number: 72.27.1). Exostoses of the collum femoris and arthrosis deformans of the extremitas sternalis of the right claviculae appeared to a lesser degree. I should mention that the right clavicula is missing. Changes were caused by arthrosis deformans on the articular surface of the costae of a male (Inv. number: 72.24.1). Less expressed arthritis deformans occurred on the right caput humeri of a female (Inv. number: 72.1.1) and on the left caput humeri of a female (Inv. number: 72.15.1). Status post fracturam was detected on the left clavicula of a male (Inv. number: 72.38.1) and fractura completa on the right ulna of a male (Inv. number: 72.45.1).

In summarizing the above-mentioned facts, it may be established that anatomical variations and pathological changes occurred more frequently on the male than the female skeletons.

REFERENCES

ALEXEYEV, V.P. (1966): Osteometria. Metodika anthropologitshkeskih isledovaniy. - Moskva: 251 pp. (in Russian).

DEBETS, G.F. & DUERNOVO, Yu.A. (1971): (Long bones from Eneolithic burial grounds in Turkmenia). - Sov. Arh. 1: 26-35 (in Russian).

FARKAS, Gy. (1972): Paleoantropológiai metodikák [Anthropological practice]. - Szeged: 28-66 (in Hungarian).

LOTTERHOF, E. (1978): On the problem of gracilization in the Central Danubian Basin, III. - Annls hist.-nat. Mus. natn. hung. 70: 369-371.

MARTIN, R. (1928): Lehrbuch der Anthropologie, II. - Jena: 579-1182.

MARTIN, R. & SALLER, K. (1957): Lehrbuch der Anthropologie. - Bd. 1. Stuttgart: 440-597.

PAP, I. (1978-1979): Data on the anthropology of the Arpadian age population of the plain between rivers Danube and Tisza. - Anthrop. hung. 16: 77-116.

Author's address: DR. ILDIKÓ PAP

Anthropological Department
Hungarian Natural History Museum
Budapest, Bajza utca 39.
H-1062

Table 1 Parameters of the male and female series - Post-cranium

Characteristics		Males				Females			
		N	V	M	s	N	V	M	s
Humerus 1	R	13	300-351	325.31	14.22	10	280-330	302.70	18.54
	L	12	290-352	323.42	18.03	11	269-327	297.30	18.76
2	R	13	292-346	319.92	14.85	10	276-325	298.78	18.52
	L	12	287-347	319.33	18.33	11	266-321	293.27	18.50
3	R	12	49-56	51.67	1.79	9	43-57	48.00	4.21
	L	11	47-54	50.00	1.76	7	42-48	44.86	1.98
4	R	13	61-70	65.23	2.35	10	51-64	58.40	4.70
	L	11	62-67	64.82	1.91	10	52-64	58.00	4.11
5	R	13	21-25	22.38	1.39	11	17-21	18.55	1.45
	L	15	20-24	21.53	1.26	11	17-20	18.45	0.94
6	R	13	16-18	16.77	0.86	11	12-18	14.45	1.58
	L	15	14-19	16.33	1.40	11	12-17	14.27	1.49
7	R	13	62-70	66.46	2.47	11	54-65	58.64	3.18
	L	14	62-68	64.64	1.87	10	53-63	57.50	3.26
7a	R	13	67-77	70.46	3.18	11	55-68	61.73	3.93
	L	14	65-73	67.79	2.53	10	56-65	60.90	3.36
9	R	12	43-49	45.83	1.72	8	37-46	40.63	3.34
	L	12	41-50	44.58	1.74	8	36-44	40.13	2.64
6:5	R	13	64.00-80.95	75.08	11.91	11	66.67-85.71	77.95	10.78
	L	15	62.50-90.48	76.00	13.49	11	66.67-89.47	76.77	13.31
7:1	R	13	18.80-22.67	20.46	2.70	10	18.46-21.43	19.60	2.35
	L	11	17.61-22.41	20.50	2.82	10	14.36-21.38	18.60	4.71
Radius 1	R	10	231-263	246.00	11.64	5	216-244	216.50	8.95
	L	9	231-258	248.11	7.11	7	200-248	223.14	17.52
2	R	12	217-248	231.58	11.67	7	192-232	213.43	14.81
	L	9	219-245	233.33	8.44	8	188-235	212.75	15.03
4	R	12	12-16	14.25	1.22	9	12-15	13.33	1.07
	L	10	12-17	14.30	1.95	8	11-14	12.38	1.31
5	R	12	9-12	10.83	0.87	9	8-11	8.89	1.21
	L	11	10-12	10.55	0.84	8	8-10	8.50	0.87
3	R	12	39-48	43.50	2.62	9	34-43	39.00	2.92
	L	11	42-48	43.27	1.80	8	35-43	37.75	2.98
5:4	R	12	68.75-91.67	77.88	12.19	9	60.00-93.33	68.28	22.12
	L	10	64.71-84.62	75.55	8.94	8	57.14-81.82	70.00	15.60
3:2	R	12	15.79-21.92	18.71	3.20	7	17.73-19.81	18.57	1.78
	L	9	17.28-19.63	18.28	1.43	8	16.07-19.42	17.75	2.61

Table 1 (continued)

Characteristics		Males				Females			
		N	V	M	s	N	V	M	s
Ulna	1 R	7	252-282	272.57	10.62	7	235-271	248.14	14.99
	L	11	249-283	266.45	12.31	5	235-265	246.20	13.85
	2 R	8	218-249	238.13	12.47	10	206-241	220.00	13.30
	L	14	219-250	235.00	12.06	8	207-238	219.25	12.89
	11 R	10	11-17	13.50	1.99	9	8-13	10.89	1.79
	L	13	11-16	13.15	1.22	8	9-12	10.25	1.17
	12 R	10	13-20	15.20	2.15	10	11-15	12.90	1.32
	L	13	13-20	15.69	1.92	8	11-15	12.50	1.21
	13 R	10	16-25	19.80	2.63	9	15-19	16.56	1.15
	L	14	16-25	20.29	2.13	8	15-18	16.38	0.93
	14 R	10	21-29	24.70	1.53	9	18-25	21.67	2.14
	L	14	21-34	24.86	3.22	8	19-29	22.50	3.26
	3 R	8	34-43	39.75	3.15	10	32-38	35.00	2.33
	L	14	36-43	39.57	2.18	6	31-36	33.67	1.54
	3:2 R	8	13.65-19.37	16.81	4.41	10	14.35-18.45	15.95	3.08
	L	14	14.40-19.18	16.93	2.57	6	13.78-15.87	15.58	2.05
	11:12 R	10	78.57-106.25	89.85	18.78	9	57.14-100.00	84.00	28.00
	L	13	65.00-106.67	83.88	22.61	8	66.67-100.00	82.69	23.74
	13:14 R	10	70.83-87.50	80.05	12.32	8	53.00-94.12	74.00	25.07
	L	14	69.57-100.00	82.46	16.78	8	58.62-89.47	73.63	20.48
Femur	1 R	11	418-460	446.64	18.80	10	383-466	424.70	28.60
	L	13	425-484	449.62	17.86	10	382-470	425.30	30.89
	2 R	12	415-465	440.83	15.70	11	378-462	418.27	29.02
	L	13	421-480	446.62	17.47	9	379-466	423.89	29.81
	21 R	11	78-84	81.82	2.01	10	71-83	76.90	3.74
	L	11	81-90	83.36	2.50	9	68-85	76.56	5.56
	6 R	12	22-28	26.00	1.65	11	21-30	24.27	2.29
	L	13	25-28	26.38	1.13	11	20-30	24.36	2.91
	7 R	12	25-30	28.00	1.51	11	20-27	23.91	4.37
	L	13	25-31	27.31	1.91	11	21-28	24.18	1.94
	9 R	13	28-38	32.77	3.01	11	25-33	29.00	2.76
	L	13	28-39	32.77	4.16	11	26-34	29.45	2.36
	10 R	13	23-29	25.54	1.72	11	18-28	22.27	2.56
	L	13	23-28	25.23	1.48	11	19-27	21.64	2.12
	8 R	12	84-96	91.08	3.50	11	74-93	82.64	5.52
	L	13	86-98	90.62	3.62	11	74-95	83.91	6.72
	8:2 R	12	18.63-21.48	20.42	2.34	11	18.82-21.18	19.77	1.32
	L	13	19.14-21.26	20.27	1.83	9	19.17-20.45	19.39	1.31
	6:7 R	12	78.57-104.00	93.04	15.61	11	91.30-120.00	101.95	20.13
	L	13	87.10-112.00	96.96	15.54	11	86.96-125.00	101.18	24.84
	10:9 R	13	64.86-87.50	78.31	12.81	11	64.52-112.00	76.91	23.73
	L	13	65.79-86.21	77.23	12.44	11	66.67-96.43	73.41	54.68

Table 1 (continued)

Characteristics		Males				Females			
		N	V	M	s	N	V	M	s
Tibia 1	R	12	331-394	364.67	19.40	9	307-377	345.11	23.54
	L	13	330-388	363.31	18.99	9	309-374	344.56	25.36
1a	R	12	341-403	371.92	19.13	8	311-388	353.38	26.22
	L	13	341-398	370.77	18.63	9	316-386	351.00	26.17
1b	R	12	332-393	362.75	18.85	8	304-376	345.63	25.53
	L	13	332-392	360.54	18.71	9	306-375	341.89	24.94
2	R	12	331-392	359.25	19.16	8	304-373	343.13	23.34
	L	11	332-387	360.18	18.90	8	305-375	341.63	25.54
5	R	10	68-77	73.10	3.02	8	56-72	64.63	4.49
	L	7	69-77	73.57	2.58	8	55-74	65.50	6.35
6	R	10	47-65	52.10	4.89	8	41-50	45.88	2.89
	L	6	48-55	50.67	2.44	9	41-52	44.67	3.75
8	R	13	21-29	27.25	2.16	10	21-28	24.30	2.31
	L	13	20-30	26.85	2.80	9	21-29	24.44	2.66
8a	R	13	24-36	31.69	2.96	10	24-32	27.90	2.44
	L	13	23-38	31.38	3.93	9	23-33	27.56	3.21
9	R	13	17-28	21.46	3.16	10	17-24	18.90	4.86
	L	13	18-28	21.38	3.23	9	16-22	18.11	1.97
9a	R	13	20-27	23.31	2.90	10	19-25	20.80	1.71
	L	13	20-32	24.15	3.93	9	18-25	20.44	2.19
10	R	13	78-86	82.00	2.68	10	68-86	74.70	6.10
	L	13	77-88	82.00	3.42	9	66-86	74.33	6.42
10b	R	13	73-80	75.38	2.49	10	61-78	68.10	3.38
	L	13	70-82	75.15	3.76	9	61-77	67.56	5.11
9a: 8a	R	13	57.14-125.00	74.81	33.58	10	65.52-84.00	74.75	11.37
	L	13	55.25-128.00	79.50	46.54	9	63.33-86.96	74.22	16.67
10b: 1	R	12	18.89-23.56	20.54	2.58	9	18.52-20.85	20.00	2.34
	L	13	19.30-22.73	20.69	1.97	9	18.87-20.59	19.56	1.27
Stature		12		165.32		10		157.30	
Weight		11		64.67		10		58.55	
Q		11		2.36		10		2.55	

R= Right, L= Left

Table 2

Individual measurements of the male long bones

Characteristics			72.2.1	72.13.1	72.19.1	72.20.1	72.21.1	72.23.1	72.27.1	72.33.1	72.38.1	72.39.1	72.41.1	72.44.1	72.45.1	72.46.1	72.51.1
Humerus	1	R	300	-	-	321	321	323	328	333	325	325	351	300	331	327	344
		L	294	345	-	-	322	317	-	332	323	317	352	290	329	320	340
	2	R	294	-	-	314	316	321	322	329	320	320	346	292	327	320	338
		L	289	342	-	-	319	314	-	329	318	313	347	287	324	315	335
	3	R	52	-	-	56	51	49	51	50	-	53	53	51	52	50	50
		L	49	54	-	-	51	47	-	-	49	50	52	49	50	50	49
	4	R	66	-	-	70	63	65	66	61	66	64	68	63	67	64	65
		L	67	67	-	-	64	62	-	-	64	64	67	62	66	64	66
	5	R	22	-	-	24	25	24	23	21	23	21	22	21	23	21	21
		L	22	21	21	23	24	23	23	21	21	20	21	21	22	20	20
	6	R	17	-	-	16	16	18	18	16	16	16	17	18	17	16	17
		L	17	15	16	16	15	18	19	16	16	16	14	19	16	16	16
	7	R	66	-	-	70	69	65	62	64	70	64	66	68	68	65	67
		L	65	65	65	68	68	65	66	64	-	63	62	65	64	62	65
	7a	R	68	-	-	76	77	70	67	67	73	69	69	71	71	68	70
		L	68	68	69	72	73	68	68	65	-	65	65	69	68	65	66
	9	R	45	-	-	49	45	45	48	-	45	47	46	44	47	46	43
		L	44	50	42	-	46	42	-	-	44	47	41	43	46	46	44
	6:5	R	77.27	-	-	66.67	64.00	75.00	78.26	76.19	69.57	76.19	77.27	85.71	73.91	76.19	80.95
		L	77.27	71.43	76.19	69.57	62.50	78.26	82.61	76.19	76.19	80.00	66.67	90.48	72.73	80.00	80.00
	7:1	R	22.00	-	-	21.81	21.50	20.12	18.90	19.22	21.54	19.69	18.80	22.67	20.54	19.88	19.48
		L	22.11	18.84	-	-	21.12	20.50	-	19.28	-	19.87	17.61	22.41	19.45	19.38	19.12
Radius	1	R	231	-	231	-	-	246	251	-	-	243	261	233	248	253	263
		L	-	257	-	-	-	246	-	-	241	242	257	231	246	255	258
	2	R	217	-	217	219	-	232	234	247	-	229	245	219	235	237	248
		L	-	244	-	-	-	230	-	-	227	230	243	219	230	241	245
	4	R	15	-	13	16	-	15	16	12	-	13	14	14	15	14	14
		L	-	-	-	17	-	17	17	-	13	12	13	14	14	13	13
	5	R	11	-	10	11	-	12	11	11	-	9	11	12	11	10	11
		L	-	11	-	11	-	11	12	-	10	10	11	11	11	10	10
	3	R	47	-	41	48	-	44	41	39	-	41	44	44	45	44	44
		L	-	45	-	48	-	43	43	-	42	42	42	43	43	42	43
	5:4	R	73.33	-	76.92	68.75	-	80.00	68.75	91.67	-	69.23	78.57	85.71	73.33	71.43	78.57
		L	-	-	-	64.71	-	64.71	70.59	-	76.92	83.33	84.62	78.57	78.57	76.92	76.92
	3:2	R	21.66	-	18.89	21.92	-	18.97	17.52	15.79	-	17.90	17.96	20.09	19.15	18.57	17.74
		L	-	18.44	-	-	-	18.70	-	-	18.50	18.26	17.28	19.63	18.70	17.43	17.55
Ulna	1	R	-	-	-	-	-	267	271	280	-	-	280	252	-	277	282
		L	250	283	249	-	-	265	274	-	266	264	-	250	264	276	283
	2	R	-	-	-	218	-	237	235	249	-	-	248	222	-	247	249
		L	219	248	220	219	-	232	238	250	233	231	250	222	233	245	250
	11	R	-	-	-	17	-	14	16	13	11	-	14	12	15	12	12
		L	13	13	11	14	-	13	13	-	12	13	14	12	16	13	14
	12	R	-	-	-	16	-	17	20	13	14	-	14	15	16	13	14
		L	16	17	14	18	-	17	20	-	16	16	14	13	15	15	15
	13	R	-	-	-	20	-	25	19	17	16	-	19	21	21	18	22
		L	21	21	16	22	-	25	21	18	21	20	19	21	21	18	20
	14	R	-	-	-	27	-	29	26	24	21	-	24	25	24	21	26
		L	23	27	23	27	-	34	21	24	24	22	25	24	23	23	27
	3	R	-	-	-	41	-	41	43	34	-	-	36	43	-	38	41
		L	42	40	36	41	-	41	43	36	40	39	37	39	42	39	39
	3:2	R	-	-	-	18.81	-	17.72	18.30	13.65	-	-	14.52	19.37	-	15.38	16.47
		L	19.18	16.13	16.36	18.72	-	17.67	18.07	14.40	17.17	16.88	14.80	17.57	18.03	15.92	15.60
	11:12	R	-	-	-	106.25	-	82.35	80.00	100.00	78.57	-	100.00	80.00	93.75	92.31	85.71
		L	81.25	76.47	78.57	77.78	-	76.47	65.00	-	75.00	81.25	100.00	92.31	106.67	86.67	93.33
	13:14	R	-	-	-	74.07	-	86.21	73.08	70.83	76.19	-	79.17	84.00	87.50	85.71	84.62
		L	91.30	77.78	69.57	81.48	-	73.53	100.00	75.00	87.50	90.91	76.00	87.50	91.30	78.26	74.07

Table 2 (continued)

Characteristics		72.2.1	72.13.1	72.19.1	72.20.1	72.21.1	72.23.1	72.27.1	72.33.1	72.38.1	72.39.1	72.41.1	72.44.1	72.45.1	72.46.1	72.51.1
Femur 1	R	418	-	425	-	-	453	451	460	454	-	474	421	453	437	467
	L	425	-	426	438	-	454	456	454	458	452	484	427	462	439	470
2	R	415	-	425	439	-	451	446	458	452	-	473	419	451	436	465
	L	421	-	425	435	-	451	450	453	457	450	480	424	461	436	463
21	R	83	-	78	-	-	79	84	81	83	-	83	83	83	80	83
	L	83	-	-	90	-	81	84	81	83	-	84	84	83	81	83
6	R	26	-	27	26	-	24	27	22	27	-	25	27	28	26	27
	L	25	-	25	26	-	26	28	25	28	27	26	26	27	26	28
7	R	25	-	29	30	-	28	30	28	29	-	27	27	28	29	26
	L	25	-	26	29	-	29	27	29	28	26	28	25	31	27	25
9	R	28	-	30	35	-	38	36	30	33	32	33	32	37	32	30
	L	28	-	30	35	-	39	34	32	33	31	35	30	38	32	29
10	R	23	-	26	26	-	27	29	25	25	26	24	28	24	25	24
	L	23	-	24	26	-	28	28	25	25	24	25	26	25	24	25
8	R	87	-	91	94	-	84	90	95	94	-	90	90	96	93	89
	L	86	-	88	95	-	88	88	93	94	90	92	86	98	90	90
8:2	R	20.96	-	21.41	20.96	-	18.63	20.18	20.74	20.80	-	19.03	21.48	21.29	21.33	19.14
	L	20.43	-	20.66	21.84	-	19.51	19.56	20.53	20.57	20.00	19.17	20.28	21.26	20.64	19.14
6:7	R	104.00	-	93.10	86.67	-	85.71	90.00	78.57	93.10	-	92.59	100.00	100.00	89.66	103.85
	L	100.00	-	96.15	89.66	-	89.66	103.70	86.21	100.00	103.85	92.86	104.00	87.10	96.30	112.00
10:8	R	82.14	-	86.67	74.29	-	71.05	80.56	83.33	75.76	81.25	72.73	87.50	64.86	78.13	80.00
	L	82.14	-	80.00	74.29	-	69.29	82.35	78.13	75.76	77.42	71.43	86.67	65.79	75.00	86.21
Tibia 1	R	331	370	333	-	-	367	368	379	363	-	381	342	374	370	394
	L	330	379	336	343	-	364	373	373	368	-	382	342	374	372	388
1a	R	341	375	342	-	-	371	380	385	373	-	388	348	383	374	403
	L	341	383	344	351	-	371	381	381	376	-	389	348	382	374	398
1b	R	333	367	332	-	-	363	372	373	365	-	380	339	372	364	393
	L	332	372	334	340	-	364	368	369	367	-	377	337	371	363	392
2	R	335	365	331	-	-	351	350	372	366	-	377	338	368	366	392
	L	332	374	334	340	-	350	355	372	368	-	377	-	373	-	387
5	R	71	73	77	-	-	68	73	-	74	-	-	76	77	70	72
	L	74	77	-	-	-	69	-	73	76	-	-	-	73	-	73
6	R	52	65	47	-	-	50	50	-	52	-	-	54	51	50	50
	L	51	55	-	-	-	51	-	48	-	-	-	-	49	-	50
8	R	26	27	27	29	-	28	28	28	21	-	28	26	30	28	27
	L	26	30	26	28	-	23	29	28	20	-	27	26	30	28	28
8a	R	29	31	32	33	-	32	33	35	24	-	30	32	36	33	32
	L	33	34	29	34	-	25	33	32	23	-	32	33	38	32	30
9	R	20	20	17	22	-	22	24	20	26	-	20	28	18	19	23
	L	20	20	18	22	-	28	23	19	27	-	19	19	19	20	24
9a	R	23	23	21	25	-	24	27	20	30	-	22	21	22	20	25
	L	27	23	20	26	-	32	26	20	29	-	21	22	21	20	27
10	R	81	82	78	85	-	78	82	86	80	-	82	80	84	82	86
	L	79	87	77	83	-	80	81	82	80	-	81	79	87	82	88
10b	R	78	76	74	80	-	73	77	76	73	-	72	70	76	76	79
	L	75	82	70	79	-	73	77	72	73	-	74	70	75	77	80
9a:8a	R	79.31	74.19	85.63	75.76	-	75.00	81.82	57.14	125.00	-	73.33	65.63	61.11	60.61	78.13
	L	81.82	67.65	88.97	76.47	-	128.00	78.79	62.50	126.09	-	65.63	66.67	55.26	62.50	90.00
10b:1	R	23.56	20.54	22.22	-	-	18.89	20.92	20.05	20.11	-	18.90	20.47	20.32	20.54	20.05
	L	22.73	21.64	20.83	23.03	-	20.05	20.64	19.30	19.84	-	19.37	20.47	20.05	20.70	20.62
Stature (cm)		158.79	-	160.87	163.96[a]	-	169.64	167.55	158.90	168.80	-	174.28	159.02	167.85	162.83	171.31
Weight (kg)		61.76	-	-	69.85[a]	-	60.32	59.34	64.80	68.23	-	66.17	60.87	67.28	65.28	67.53
Q		2.45	-	-	2.60[a]	-	2.10	2.11	2.57	2.39	-	2.18	2.41	2.39	2.46	2.30

[a] Calculated from the left side

Table 3 Individual measurements of the female long bones

Characteristics		72.1.1	72.3.1	72.5.1	72.6.1	72.14.1	72.15.1	72.42.1	72.48.1	72.53.1	72.55.1	-
Humerus 1	R	330	327	295	283	308	324	-	298	280	288	294
	L	327	324	287	269	300	319	306	289	276	281	292
2	R	325	321	292	278	306	318	-	292	276	285	288
	L	321	320	286	266	298	315	301	285	271	277	286
3	R	57	51	45	-	47	50	-	45	43	46	48
	L	46	-	44	-	46	48	-	44	42	44	-
4	R	63	63	57	52	60	64	-	62	56	51	56
	L	62	63	56	-	58	64	62	52	55	55	57
5	R	19	21	17	17	18	19	17	18	19	18	21
	L	19	19	18	17	17	18	19	18	19	19	20
6	R	15	18	13	13	14	15	14	12	15	15	15
	L	15	17	13	12	14	15	14	12	15	14	15
7	R	61	65	56	54	59	60	58	55	60	57	61
	L	58	63	55	53	56	-	58	54	59	57	62
7a	R	65	68	59	55	61	63	62	56	64	61	65
	L	62	64	57	56	59	-	63	57	64	62	65
9	R	41	45	37	-	40	46	-	39	37	-	40
	L	40	44	36	-	40	42	-	40	37	-	42
6:5	R	78.95	85.71	76.47	76.47	77.78	78.94	82.35	66.67	78.95	83.33	71.43
	L	78.95	89.47	72.22	70.59	82.35	83.33	73.68	66.67	78.95	73.68	75.00
7:1	R	18.48	20.80	18.98	19.08	19.16	18.52	-	18.46	21.43	19.79	20.75
	L	17.74	19.44	19.16	14.36	18.67	-	18.95	15.22	21.38	20.28	21.23
Radius 1	R	-	-	221	-	234	244	-	216	-	219	-
	L	248	246	217	200	-	-	-	214	219	218	-
2	R	-	232	208	192	223	229	-	203	-	207	-
	L	235	233	206	188	-	-	224	204	206	206	-
4	R	-	14	13	13	15	13	13	12	13	15	-
	L	13	14	11	11	-	-	13	11	14	12	-
5	R	-	10	8	8	9	10	8	8	8	11	-
	L	9	10	9	8	-	-	8	8	8	9	-
3	R	-	43	38	37	40	41	34	36	41	41	-
	L	39	43	35	35	-	-	36	35	39	40	-
5:4	R	-	71.43	61.54	61.54	60.00	76.92	61.54	66.67	61.54	93.33	-
	L	69.23	71.43	81.82	72.73	-	-	61.54	72.73	57.14	75.00	-
3:2	R	-	18.53	18.27	19.27	17.94	17.90	-	17.73	-	19.81	-
	L	16.60	18.45	16.99	18.62	-	-	16.07	17.16	18.93	19.42	-
Ulna 1	R	-	271	240	-	-	267	249	239	235	-	236
	L	-	265	235	-	257	-	-	238	-	236	-
2	R	241	238	211	-	222	236	223	208	208	210	206
	L	238	233	208	-	227	-	225	208	207	208	-
11	R	-	13	12	-	11	12	11	8	8	11	12
	L	10	12	10	9	12	-	10	9	-	10	-
12	R	-	14	12	12	13	12	12	11	14	14	15
	L	12	12	13	12	12	-	13	11	-	15	-
13	R	-	16	17	15	17	19	16	16	-	16	17
	L	18	17	17	15	16	-	16	16	-	16	-
14	R	-	25	20	-	23	23	21	18	20	23	22
	L	22	29	19	20	25	-	22	20	-	23	-
3	R	35	37	33	-	33	36	32	32	36	38	38
	L	33	34	33	-	36	-	31	33	-	-	-
3:2	R	14.52	15.55	15.64	-	14.86	15.25	14.35	15.38	17.31	18.00	18.45
	L	13.87	14.59	15.87	-	15.86	-	13.78	15.87	-	-	-
11:12	R	-	92.86	100.00	-	84.62	100.00	91.67	72.73	57.14	78.57	80.00
	L	83.33	100.00	76.92	75.00	100.00	-	76.92	81.82	-	66.67	-
13:14	R	-	64.00	85.00	-	73.01	53.00	76.19	94.12	-	69.57	77.27
	L	81.82	58.62	89.47	75.00	64.00	-	72.73	80.00	-	69.57	-

Table 3 (continued)

Characteristics		72.1.1	72.3.1	72.5.1	72.6.1	72.14.1	72.15.1	72.42.1	72.48.1	72.53.1	72.55.1	-
Femur 1	R	459	466	410	383	438	446	431	396	-	406	407
	L	464	470	415	382	445	447	431	404	386	408	-
2	R	457	462	409	378	435	445	428	395	382	404	406
	L	457	466	412	379	440	445	427	-	384	405	-
21	R	78	83	73	71	78	83	77	73	-	74	74
	L	78	85	73	72	78	84	78	-	68	74	-
6	R	25	30	24	21	25	25	24	24	22	23	24
	L	26	30	23	20	28	25	25	23	21	23	24
7	R	27	25	23	23	24	26	25	20	21	24	25
	L	28	24	23	23	23	26	25	21	23	24	26
9	R	33	25	31	25	30	30	29	25	30	30	31
	L	34	28	30	26	31	29	29	27	30	31	32
10	R	22	28	20	21	20	23	23	18	21	23	23
	L	23	27	20	20	21	23	21	19	21	22	22
8	R	86	93	80	76	85	85	85	77	74	82	86
	L	90	95	79	74	90	87	85	76	77	83	87
8:2	R	18.82	20.13	19.56	20.11	19.54	19.10	19.86	19.49	19.37	20.30	21.18
	L	19.69	20.39	19.17	19.53	20.45	19.55	19.91	-	20.05	20.49	-
6:7	R	92.59	120.00	104.35	91.30	104.17	96.15	96.00	120.00	104.76	95.83	96.00
	L	92.86	125.00	100.00	86.96	121.73	96.15	100.00	109.52	91.30	95.83	92.31
10:9	R	66.67	112.00	64.52	84.00	66.67	76.67	79.31	72.00	70.00	76.67	74.19
	L	67.65	96.43	66.67	76.92	67.74	79.31	72.21	70.38	70.00	70.97	68.75
Tibia 1	R	371	377	339	307	356	357	351	318	-	-	330
	L	373	374	339	309	353	364	355	324	310	-	-
1a	R	376	388	344	311	360	368	357	325	-	-	-
	L	378	386	345	316	358	372	358	329	316	-	-
1b	R	369	376	338	304	352	360	347	319	-	-	-
	L	368	375	337	306	351	360	348	323	309	-	-
2	R	365	373	334	304	354	356	346	317	-	-	-
	L	366	375	337	305	351	361	-	321	307	-	-
5	R	61	68	63	56	65	72	71	61	-	-	-
	L	70	70	67	55	-	74	70	60	58	-	-
6	R	47	49	44	41	46	50	46	44	-	-	-
	L	46	49	42	41	43	52	46	42	43	-	-
8	R	26	28	26	23	23	26	24	21	21	-	25
	L	27	29	26	22	23	25	25	21	22	-	-
8a	R	29	32	30	26	27	29	29	24	25	-	28
	L	30	33	28	23	28	30	27	25	24	-	-
9	R	20	24	19	17	19	19	17	17	17	-	20
	L	19	22	18	16	20	18	16	17	17	-	-
9a	R	21	25	20	20	21	21	19	19	21	-	21
	L	19	25	20	20	23	20	18	19	20	-	-
10	R	79	86	77	68	72	80	72	68	68	-	77
	L	80	86	76	66	73	78	73	67	70	-	-
10b	R	71	78	68	64	68	70	65	64	61	-	72
	L	71	77	68	61	68	71	67	62	63	-	-
9a:8a	R	72.41	78.13	66.67	76.92	77.78	72.41	65.52	79.17	84.00	-	75.00
	L	63.33	75.76	71.43	86.96	82.14	66.67	66.67	76.00	83.33	-	-
20b:1	R	19.14	20.69	20.06	20.85	19.10	19.61	18.52	20.13	-	-	21.82
	L	19.03	20.59	20.06	19.74	19.26	19.51	18.87	19.14	20.32	-	-
Stature (cm)		167.78	169.65	153.83	146.03	161.91	164.21	159.92	149.84	146.29	-	153.03
Weight (kg)		63.04	72.39	54.30	49.78	59.62	67.21	57.83	51.25	49.29	-	58.75
Q		2.26	2.52	2.30	2.33	2.27	2.49	2.26	2.28	2.30	-	2.55

Appendix

Inventory number		Grave number	Sex	Age	Site
Cranium	Skeleton				
72.1.2	72.1.1	4	F	Ad.	Gurmannhalom
72.2.2	72.2.1	3	M	Mat.	Gurmannhalom
72.3.2	72.3.1	5	F	Ad.	Gurmannhalom
72.4.2	72.4.1	13	F	Ad.	Gurmannhalom
-	72.5.1	11	F	Ad.	Gurmannhalom
-	72.6.1	12	F	Ad.	Gurmannhalom
72.7.1	-	8	F	Ad.	Gurmannhalom
72.8.1	-	-	M	Juv.	Gurmannhalom
72.9.1	-	-	F	Mat.	Gurmannhalom
72.10.1	-	8	M	Mat.	Gurmannhalom
72.11.1	-	14	M	Mat.	Gurmannhalom
72.13.2	72.13.1	4	M	Mat.	Boldogasszonyhalom
72.14.2	72.14.1	2	M	Ad.	Boldogasszonyhalom
72.15.2	72.15.1	11	F	Ad.	Boldogasszonyhalom
72.16.1	72.16.1	10	-	Inf. I.	Boldogasszonyhalom
72.17.1	72.17.1	13	-	Inf. I.	Boldogasszonyhalom
72.18.1	-	-	M	Ad.	Boldogasszonyhalom
-	72.19.1	1	M	Ad.	Szőrhalom
72.20.2	72.20.1	3	M	Ad.	Szőrhalom
72.21.2	72.21.1	2	M	Ad.	Szőrhalom
72.22.2	72.22.1	1	M	Ad.	Gurmannhalom
-	72.23.1	-	M	Ad.	Boldogasszonyhalom
-	72.24.1	-	M	Mat.	-
-	72.25.1	-	-	-	Gurmannhalom (mixed)
72.27.2	72.27.1	14	M	Ad.	Boldogasszonyhalom
72.28.1	-	12	M	Mat.	Boldogasszonyhalom
72.29.1	72.29.1	-	-	-	Boldogasszonyhalom (mixed)
72.30.1	-	-	F	Mat.	Boldogasszonyhalom
72.31.1	-	-	F	Ad.	Boldogasszonyhalom
72.32.2	-	5	M	Mat.	Gógányszél
72.33.2	72.33.1	2	M	Mat.	Csíkvár
72.34.1	-	7	M	Mat.	Csíkvár
72.35.1	-	-	F	Ad.	Csíkvár
72.36.1	-	-	M	Mat.	Csíkvár
72.37.1	-	-	M	Sen.	Csíkvár
72.38.2	72.38.1	1	M	Mat.	Ludas
-	72.39.1	2	M	Ad.	Ludas
72.40.1	-	3	M	Ad.	Ludas
72.41.2	72.41.1	4	M	Ad.	Ludas
72.42.2	72.42.1	5	F	Mat.	Ludas
72.43.2	72.43.1	6	M	Ad.	Ludas
-	72.44.1	11	M	Mat.	Ludas
72.45.2	72.45.1	12	M	Mat.	Ludas
72.46.2	72.46.1	13	M	Mat.	Ludas
72.47.2	72.47.1	15	M	Ad.	Ludas
72.48.2	72.48.1	17	F	Ad.	Ludas
72.49.2	-	-	-	Inf. I.	Ludas
72.50.1	-	5/a	M	Mat.	Ludas
-	72.51.1	3	M	Ad.	Nyársapát
72.53.2	72.53.1	1	F	Ad.	Nyárkútrét
72.54.2	72.54.1	2	-	Inf. II.	Nyárkútrét
72.55.2	72.55.1	3	F	Mat.	Nyárkútrét
72.57.1	-	-	M	Ad.	Nyúlfülehalom
72.58.1	-	-	M	Ad.	-
72.59.1	-	-	-	Juv.	Nyúlfülehalom
72.70.1	-	-	F	Mat.	Nyúlfülehalom
72.72.1	-	-	M	Mat.	Ludas
-	-	3	F	Ad.	Boldogasszonyhalom
-	-	-	F	Mat.	Boldogasszonyhalom

F= Female, M= Male

ANTHROPOLOGIA HUNGARICA

XVIII. 1982-1983 p. 75—84

The differentiation of the skin patterns in the territory of Hungary

By

T. D. GLADKOVA — T. A. TÓTH

(Received April 20, 1983)

Abstract. - Comparative dermatoglyphic analysis of 21 local groups (2720 individuals) of the Hungarian male rural population is presented. The great majority of the groups is characterized by the Europoid elements except Taktabáj, Szendrő and Rozsály. With 5 tables and 4 figures.

Present paper contains the brief general survey of the skin pattern distribution on the territory of the Hungarian People's Republic. We used our own formerly published data (GLADKOVA & TÓTH 1973, 1975, 1977, 1979, 1981) and our new materials from 9 local Hungarian groups. In all 21 groups (over 2700 males) from nine ethnogeographical regions of the country were investigated (Fig. 1). The palm- and fingerprints were collected by T.A. TÓTH in 1969-1971. The prints have been analysed by using the CUMMINS and MIDLO's method of pattern interpretation (1961).

The new local groups have been taken from several regions: Göcsej, the region south-west to the Lake Balaton (Kustánszeg, Becsvölgye, Petrikeresztúr, Csonkahegyhát)*, Jászság in the Middle Tisza region (Jászárokszállás, Jászfényszaru), North Hungary (Szikszó) and Szamoshát, North-East Hungary (Matolcs, Rozsály).

Data concerning the new groups are given in Tables 1-5. Inasmuch as the bilateral variation and the distribution of the patterns on digits I-V and the palm pads are almost the same as in another peoples we give in the tables the average frequency for both hands.

The data of the tables show an extensive variability, dispersity and crossing similarity between the western, Middle-Tisza and eastern local groups. So, for example, the frequency of the carpal axial triradius (t) is the same in the groups Becsvölgye (Balaton) and Rozsály (East Hungary). With regard to the pattern frequency of interdigital pad IV and the type 11 D these groups are similar. Whereas the Middle-Tisza group Jászfényszaru and the East group Matolcs are similar in respect of the frequency of carpal axial triradius and the hypothenar pattern.

At the same time, as the tables show, the East group Rozsály is characterized, in comparison with the other samples, by the least frequency of arches, by the largest one of whorls and the highest on of Dl_{10}. The sample Rozsály has low values of the type 5A and the largest pattern frequency on palm pad III.

If we compare a great number of groups the sum analysis of the combined traits seems to be most informative. In our previous work we gave the sum comparison characteristics of the investigated groups.

*Materials of Göcsej region have been considered in an another work (GLADKOVA, TÓTH & KONDIK, in press).

In the present paper first of all the 21 groups of Hungarians studied by us had been compared in respect to their combined frequency of the worls and hypothenar patterns. As it is known (GLADKOVA 1966) in Eurasian continent from the west to the east the frequency of the hypothenar pattern decreases, whereas the frequency of the worls increases. Thus both of these traits are significant for the dermatoglyphic character of "Europoid" and "Mongoloid".

It can be seen from Fig. 2 that the three east and east-west groups - Taktabáj (7), Szendrő (12) and Rozsály (21) should be separated from the of the rest groups by the largest frequency of whorls and the least and middle ones of the hypothenar pattern. The west group Kisfalud (11) and the West Balaton group Becsvölgye (14) are close to the Russians from Valdai (22) (PROKUDINA 1971).

Fig. 1 Map of the distribution of the studied Hungarian groups: 1 = Őrség, 2 = Milejszeg, 3= Kunhegyes, 4= Jászapáti, 5= Gacsály, 6= Mezőkövesd, 7= Taktabáj, 8= Himód, 9= Karcag, 10= Gyöngyöstarján, 11= Kisfalud, 12= Szendrő, 13= Kustánszeg, 14= Becsvölgye, 15= Petrikeresztúr, 16= Csonkahegyhát, 17= Jászárokszállás, 18= Jászfényszaru, 19= Szikszó, 20= Matolcs, 21 = Rozsály

The groups from Middle Tisza - Kunhegyes (3), Jászapáti (4) and Karcag (9) - are quite similar to each other in regard to the mean value of the whorls and hypothenar patterns. The other groups seem to differ from them. The east group Matolcs (20) is characterized by the highest frequency of hypothenar patterns. The west group Őrség (1) and the north-east group Szikszó (19) are near to each other.

Compared were further the 21 groups of Hungarians and that one of Russians from Valdai on the basis of mean sums of positive and negative deviations from a conventional zero-group, for which we took the Kazakhs (GLADKOVA 1964) attributed to the South-Siberian anthropological type. Chosen were for sum analysis 8 traits - the frequency of arches, loops (ulnar + radial), whorls, the patterns on hypothenar, interdigital pads III and IV, the type 11 D and carpal axial triradius. The frequency of all these traits had been given in our previous works.

Figure 3 shows that the local Hungarian groups are arranged rather compact in the centre of the correlation field. The east groups - Taktabáj (7), Szendrő (12) and Rozsály (21)- are separated from this complex and stand near to a conventional zero-group.

In the right upper part of Fig. 3 we see the Russians from VALDAI (22) and the Hungarians from Kisfalud (11) (west region of the country). The rest of the groups seem to form a united common complex, from which it is difficult to distinguish and then to join any kinds of groups. Only the Tisza groups Karcag (9), Jászapáti (4) and Mezőkövesd (6) can be closed. All of the other West and East groups are very near to each other.

Let us now consider a method of the sum characteristic of the investigated groups.This is the method of the middle taxonomical distance by A.A. ZUBOV and I.M. ZOLOTAREVA (1980) for the estimation of the degree of the likeness and the difference of the ethnic groups.

Using this method in our previous work (GLADKOVA, TÓTH, KONDIK, in press) we compared all of the 16 Hungarian groups including the groups from the region Göcsej with each other, and then each of them with the Mongoloid group Yakuts (GLADKOVA & MAKEEVA (1979).* In all 37 traits of finger and palm patterns were analysed. 5 traits were chosen, each was at least with a frequency from 50 % in every of the Hungarian groups present. In respect to these dermatoglyphical traits a significant difference was found between the Hungarian groups and Yakuts. These traits are as follows - interdigital pad III, tt', tt'', W and the ulnar type of the line C (4 + 5' + 5'' + 6 + 7). It was shown that almost between all the 16 Hungarian groups and Yakuts the middle taxonomical distance is higher than 1, i.e. statistically significant.

On the basis of the middle taxonomical distance of the 16 Hungarian groups from Yakuts and from the sum Hungarian a graphic (Fig. 4) was constructed. The survey of this graphic shows that (as it is in Fig. 3) the northern groups Taktabáj and Szendrő are nearer to the Yakuts than the other groups. It is also seen that within the Tisza groups Mezőkövesd (6), Jászapáti (4) and Gyöngyöstarján (10) are very close. The groups from the west region Kisfalud (11) and Becsvölgye (14) do the same. At the time we see that the West group Őrség (1) and the Tisza group Kunhegyes (3) are near. The graphic shows that the other west and east groups are also close.

Thus our sum survey of Hungarian dermatoglyphical materials confirmed the results of the previous works done several years before and showed the extensive variability, dispersity and crossing similarity between the different groups of Hungarians. But on the whole, our Hungarian samples concerning their dermatoglyphical traits are within the variation characteristic for South-Europoid peoples. Only in the North groups Taktabáj and Szendrő as well as in the North-East group Rozsály could be found some "mongoloid admixture".

The somatological investigation carried out by T.A. TÓTH (1977) in the same regions has also shown the crossing analogies between the local groups. From this it is seen that on the territory of Hungary, in the Middle Danube Basin, the main factor of race genesis and the formation of morphological appearance of the inhabitants was the metisation which took place in different historical periods.

*The "Middle Taxonomical Distance" was calculated by V.M. KONDIK.

REFERENCES

CUMMINS, H. & MIDLO, CH. (1961): Finger prints, palms and soles. An introduction to dermatoglyphics. - New York: 319 pp.

GLADKOVA, T.D. (1964): Materials to the dermatoglyphics in Khazakhs. - Quest. Anthrop. 16: 77-85 (in Russian).

GLADKOVA, T.D. (1966): Skin patterns of hand and sole of monkeys and man. - Nauka, Moskva 151 pp. (in Russian).

GLADKOVA, T.D. & MAKEEVA, T.O. (1979): Dermatoglyphical data of some representatives of the central-asian anthropological type. - Quest. Anthrop. 61: 83-99 (in Russian).

GLADKOVA, T.D. & TÓTH, T.A. (1973): Dermatoglyphics of Hungarians (to problems of the origin of Hungarian peoples). - Report on IX ICAES in Chicago, September 1973, Nauka, Moskva: 1-19.

GLADKOVA, T.D. & TÓTH, T.A. (1975): Contribution to the problem of the origin of Hungarian people according to dermatoglyphical data. - Quest. Anthrop. 51: 43-57 (in Russian).

GLADKOVA, T.D. & TÓTH, T.A. (1977): On the distribution of dermatoglyphics in Hungary (new contribution from Karcag). - Annls hist.-nat. Mus. natn. hung. 69: 361-371 (in Russian).

GLADKOVA, T.D. & TÓTH, T.A. (1979): The dermatoglyphical materials of Hungarians from Gyöngyöstarján and Kisfalud. - Annls hist.-nat. Mus. natn. hung. 71: 329-339.

GLADKOVA, T.D. & TÓTH, T.A. (1981): The dermatoglyphics of Hungarians from Szendrő. - Annls hist.-nat. Mus. natn. hung. 73: 313-324.

GLADKOVA, T.D., TÓTH, T.A. & KONDIK, V.M. (1982): On the distribution of dermatoglyphics in Hungary. - Quest. Anthrop. (in print, in Russian).

PROKUDINA, N.A. (1971): Dermatoglyphics in Russian of East Europe. - Quest. Anthrop. 39: 138-153 (in Russian).

TÓTH, T. (1977): Somatologia i paleoantropologia naselenia Vengrii. - Doct. thesis, Moskva: 1-35 pp.

ZUBOV, A.A. & ZOLOTARIEVA, I.M. (1980): Dental morphologic type of Mongols in the world racial taxonomy. - Quest. Anthrop. 64: 69-88 (in Russian).

Authors' address: T.D. GLADKOVA
Anthropological Institute
State University of Moscow
Karl Marx prospekt, 18
Moscow, K-9 USSR

DR. TIBOR TÓTH
Anthropological Department
Hungarian Natural History Museum
Budapest, Bajza utca 39.
H-1062

Table 1 Formulas of the finger pattern distribution of Hungarians

Pattern	Groups	Left	Right	Both
A	Kustánszeg	II, III, I	II, III, I=IV	II, III, I, IV
	Csonkahegyhát	II=III, V, IV=I	II, III, V=I	II, III, V, I, IV
	Petrikeresztúr	II, III, I, V, IV	II, III, IV, V, I	II, III, I, IV, V
	Becsvölgye	II, III, I, V, IV	I, III, IV, V=I	II, III, I, IV=V
	Rozsály	I, II	I = II	I, II
	Matolcs	II, III, IV, I, V	II, III, IV, V	II, III, IV, I=V
	Szikszó	II, III, I, IV=V	II, III, I, IV=V	II, III, I, IV, V
	Jászárokszállás	II, III, I, IV=V	II, III, I=IV, V	II, III, I, IV, V
	Jászfényszaru	II, III, IV, I, V	II, III, IV, I, V	II, III, IV, I, V
U	Kustánszeg	V, III, I, IV, II	V=III, I, IV, II	V, III, I, IV, II
	Csonkahegyhát	V, III=I, IV, II	V, III, I, IV, II	V, III, IV, I, II
	Petrikeresztúr	V, III, I, IV, II	V, III, I, IV, II	V, III, I, IV, II
	Becsvölgye	V, III, I, IV, II	V, III, I, IV, II	V, III, I, IV, II
	Rozsály	V, III, IV, II=I	V, III, II, I, IV	V, III, II, I, IV
	Matolcs	V, III, I, IV, II	V, III, I, IV, II	V, III, I, IV, II
	Szikszó	V, III, I, IV, II	V, III, I, IV, II	V, III, I, IV, II
	Jászárokszállás	V, III, I, IV, II	V, III, I, IV, II	V, III, I, IV, II
	Jászfényszaru	V, III, I, IV, II	V, III, I, IV, II	V, III, I, IV, II
W	Kustánszeg	IV, I, II, III, V	IV, I, II, V, III	IV, I, II, III, V
	Csonkahegyhát	IV, I, II, V, III	IV, I=II, V, III	IV, I, II, V, III
	Petrikeresztúr	IV, I, II, III, V	IV, I, II, V, III	IV, I, II, III, V
	Becsvölgye	IV, I, II, III, V	IV, I, II, III, V	IV, I, II, III, V
	Rozsály	I, IV, II, III, V	IV, I, II, III, V	IV, I, II, III, V
	Matolcs	IV, I, II, III, V	IV, I, II, V, III	IV, I, II, III, V
	Szikszó	IV, I, II, III, V	IV, I, II, III, V	IV, I, II, III, V
	Jászárokszállás	IV, II, I, III, V	IV, I, II, III, V	IV, II, I, III, V
	Jászfényszaru	I, IV, II, III, V	IV, I, II, III, V	IV, I, II, III, V

Table 2 Finger pattern frequency (%) and indices

Pattern type	Kustán-szeg n= 124	Csonka-hegyhát n= 67	Petri-keresztúr n= 136	Becs-völgye n= 205	Rozsály n= 52	Matolcs n= 147	Szikszó n= 149	Jászárok-szállás n= 115	Jászfény-szaru n= 135
A	3.40	6.46	5.65	3.04	0.96	4.38	4.40	5.38	5.87
R	4.22	3.84	4.53	4.69	3.46	3.29	3.78	4.12	5.13
U	58.29	60.61	57.92	58.20	49.61	52.46	58.76	58.03	56.43
R + U	62.71	64.45	62.45	62.89	53.07	55.75	62.54	62.15	61.56
W	33.86	29.07	31.89	34.06	45.96	39.86	33.06	32.47	32.56
$D1_{10}$	13.04	12.26	12.62	13.10	14.49	13.54	12.86	12.29	12.66
W/L · 100	53.99	45.14	51.06	54.15	86.60	71.50	52.86	55.95	52.89
A/W · 100	10.04	15.35	17.71	8.91	2.09	10.98	13.31	15.57	18.03
A/L · 100	5.42	10.02	9.04	4.83	1.81	7.85	7.04	8.65	9.53

Table 3 The endings of the lines ABCD (%)

Lines and fields		Kustán-szeg	Csonka-hegyhát	Petri-keresztúr	Becs-völgye	Rozsály	Matolcs	Szikszó	Jászárok-szállás	Jászfény-szaru
Line A	1	3.29	2.30	2.98	2.77	1.92	1.74	1.74	1.75	8.21
	2	0.82	0.77	0.36	7.05	7.69	8.33	6.97	4.37	5.97
	3	66.66	69.23	55.22	61.46	68.27	63.54	69.34	65.50	67.54
	4	15.64	10.76	15.67	7.05	10.57	7.29	4.53	7.87	5.22
	5'	9.49	16.92	24.62	20.91	11.54	18.75	17.42	18.34	12.68
	5''	3.70	-	1.15	0.25	-	-	-	0.86	-
	6	0.40	-	-	0.50	-	0.34	-	0.86	0.37
	7	-	-	-	-	-	-	-	0.43	-
Line B	3	-	-	0.37	0.50	-	0.69	0.69	-	-
	4	0.82	-	-	0.25	-	0.34	-	0.43	0.37
	5'	27.16	36.92	33.58	37.27	31.73	33.93	31.36	23.14	32.83
	5''	20.57	16.92	12.68	7.05	5.77	6.59	10.80	12.23	14.93
	6	17.69	10.76	16.41	19.39	26.92	20.83	17.42	15.28	18.65
	7	32.10	31.53	32.46	31.23	33.65	33.68	36.93	44.54	29.48
	8	0.41	3.07	4.10	4.28	1.92	3.82	2.79	3.49	3.36
	9	1.22	0.77	0.37	-	-	-	-	-	-
	0	-	-	-	-	-	-	-	0.86	0.37
Line C	5'	1.22	6.15	2.98	3.02	1.92	2.78	2.44	-	2.98
	5''	12.76	9.23	3.73	6.80	8.65	5.21	9.05	8.73	6.72
	6	6.17	5.39	4.85	6.29	12.50	4.86	4.87	2.62	4.10
	7	25.10	26.92	29.10	28.21	15.38	25.00	24.39	22.27	25.75
	8	-	-	0.37	0.25	1.92	-	-	-	-
	9	41.16	29.23	38.42	37.53	47.11	43.40	39.04	34.92	31.34
	10	0.41	3.08	4.10	4.28	1.92	3.82	2.79	3.49	3.36
	11	1.22	0.78	0.37	-	-	-	-	-	-
	X	5.35	10.71	7.46	8.31	8.65	7.98	13.24	13.97	14.55
	0	6.58	8.46	8.58	5.28	1.92	6.94	4.18	13.07	11.19
Line D	7	13.39	15.38	6.71	10.07	10.57	7.64	10.80	8.73	9.70
	8	6.17	5.38	4.85	6.29	12.50	4.86	4.87	2.62	4.10
	9	27.98	33.07	35.07	28.96	14.42	28.81	26.83	24.45	34.33
	10	17.69	10.76	16.41	19.39	26.92	20.83	17.42	15.28	18.65
	11	33.74	35.38	36.94	34.76	35.57	37.15	39.72	47.60	32.83
	12	0.41	-	-	0.50	-	0.34	-	0.86	0.37
	13	-	-	-	-	-	-	-	0.43	-
	X	-	-	-	-	-	-	0.35	-	-
	0	-	-	-	-	-	0.34	-	-	-

Table 4

Frequency of basic types of main palm lines ABCD (%)

Traits	Kustán-szeg	Csonka-hegyhát	Petri-keresztúr	Becs-völgye	Rozsály	Matolcs	Szikszó	Jászárok-szállás	Jászfény-szaru
Types of line A:									
1 (+ 2)	4.11	3.07	3.34	9.82	9.61	10.07	8.71	6.12	14.18
3 (+ 4)	82.30	79.99	70.89	68.51	78.84	70.83	73.87	73.36	72.76
5 (5'+5''+6+7)	15.59	16.92	25.77	21.66	11.54	19.05	17.42	20.49	13.05
Types of line D:									
7 (+ 8 + X + 0)	20.16	20.76	11.56	16.36	23.07	12.84	16.02	11.35	13.80
9 (+ 10)	45.67	43.83	51.48	48.35	41.34	49.64	44.25	30.73	52.97
11 (+ 12 + 13)	34.15	35.38	36.94	35.26	35.57	37.49	39.72	48.89	33.20
Main line index of CUMMINS	7.86	7.84	8.32	8.02	7.88	8.08	8.02	8.34	7.71
Types of line C:									
Ulnar (4+5'+5''+6+7)	45.25	47.69	40.66	44.32	38.45	37.85	40.75	33.62	39.55
Radial (9+10+11+12+13)	42.79	33.09	42.89	41.81	49.03	47.22	41.83	38.41	34.70
Proximal (8 + X)	5.35	10.76	7.83	8.56	10.57	7.98	13.24	13.97	14.55
Absence (0)	6.58	8.46	8.58	5.28	1.92	6.94	4.18	13.97	11.19
Types of line B:									
Distal (6+7+8+9)	51.42	46.13	53.34	54.90	62.49	58.33	57.15	51.08	51.49
Ulnar (3+4+5'+5'')	48.55	53.84	46.63	45.07	37.50	41.55	42.85	48.03	48.13
X + 0	-	-	-	-	-	-	-	0.86	0.37

Table 5

Frequency of palm patterns, accessory and axial triradii (%)

Traits	Kustán-szeg	Csonka-hegyhát	Petri-keresztúr	Becs-völgye	Rozsály	Matolcs	Szikszó	Jászárok-szállás	Jászfény-szaru
Palm patterns:									
Hy	36.21	40.00	36.56	34.26	31.73	38.89	31.36	27.95	38.05
Th/I	8.64	6.92	11.94	9.07	6.73	9.72	5.22	13.10	5.97
II	7.82	5.38	4.10	8.06	0.96	7.64	4.18	6.99	2.61
III	42.38	34.61	38.06	42.06	50.00	47.92	42.16	37.55	33.58
IV	52.67	59.23	57.46	55.41	55.77	46.53	51.56	41.42	50.00
Accessorial triradii:									
II	7.82	5.38	4.10	8.06	0.96	7.64	4.18	6.99	2.61
III	0.82	2.31	-	1.26	0.96	0.34	0.69	1.31	0.74
IV	9.46	11.54	16.41	12.34	17.31	14.93	12.89	10.91	11.19
II + III + IV	18.10	19.23	20.51	21.66	19.23	22.91	17.76	19.21	14.55
Axial triradii:									
t	74.07	71.54	77.23	74.56	74.03	69.44	76.31	76.42	69.78
t'	9.84	13.84	7.46	9.06	15.38	12.85	13.94	10.48	15.30
t''	1.23	0.78	1.86	2.01	0.96	3.12	1.04	0.43	0.74
tt'	8.23	9.23	5.10	7.56	3.85	8.68	4.87	6.99	7.46
tt''	4.11	1.54	5.16	4.03	3.85	4.17	2.09	2.62	2.24
t't''	-	0.77	0.75	-	-	-	-	-	-
tt't''	0.41	-	-	-	-	-	-	0.86	0.37
tt	0.82	-	1.16	1.01	-	0.69	1.04	0.43	0.37
t't'	-	-	-	-	-	-	0.69	1.31	-
0	1.23	2.30	0.75	1.76	1.92	1.04	-	0.43	3.73

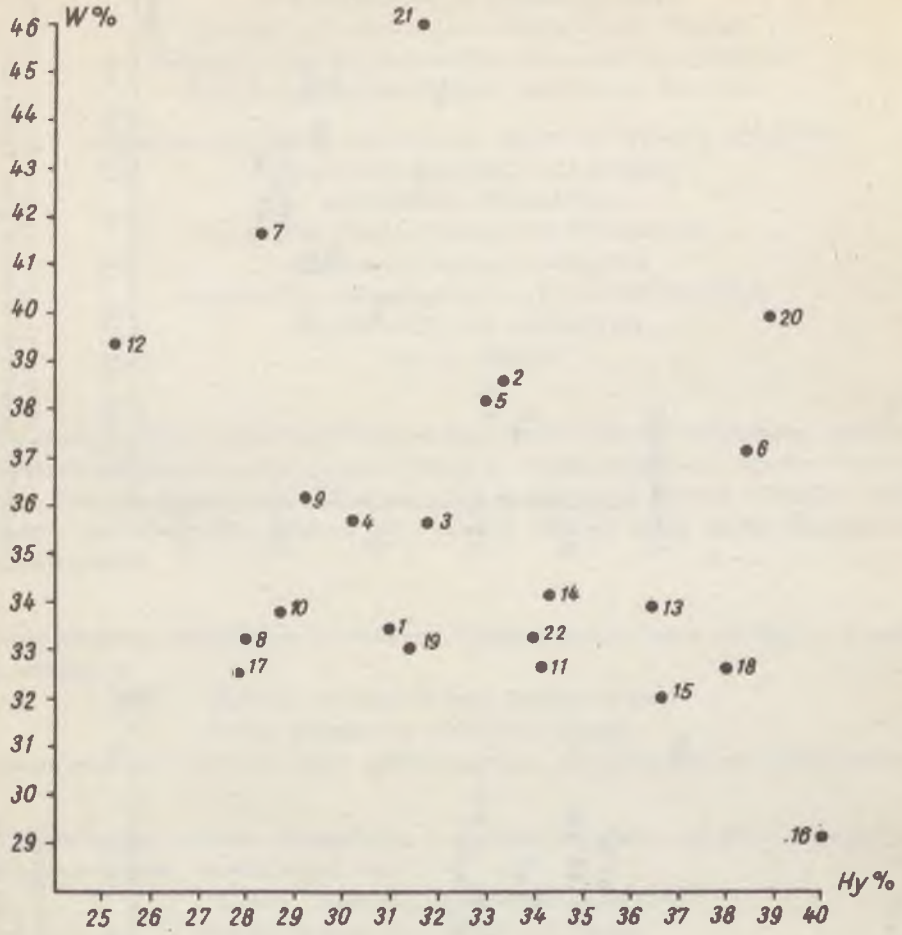


Fig. 2 Group distribution based on the frequency of whorls and hypothenar patterns (see the names of groups in Fig. 1; 22 = Russians)

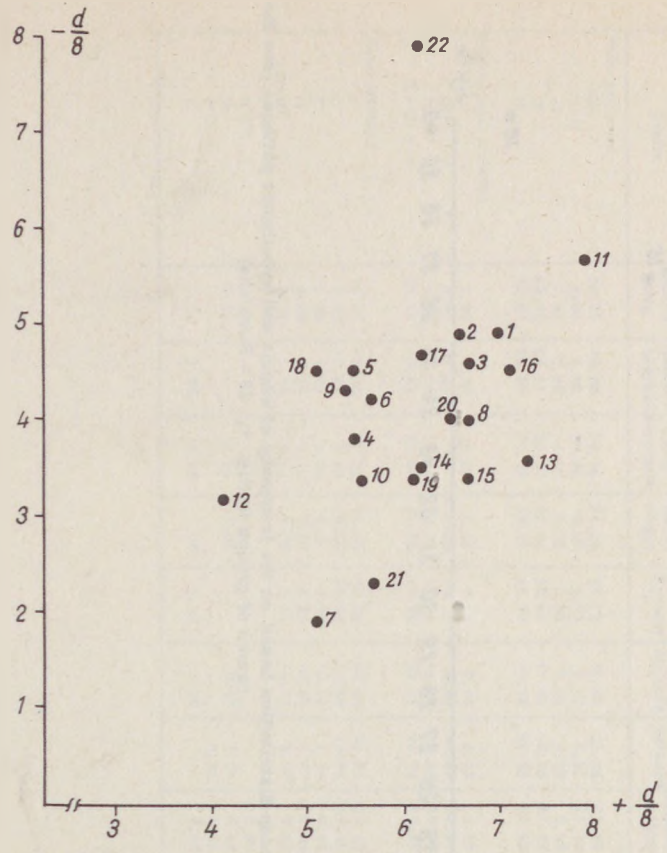


Fig. 3 The arrangement of the compared groups in respect of eight finger and palm traits (see the names of groups in Fig. 1; 22 = Russians)

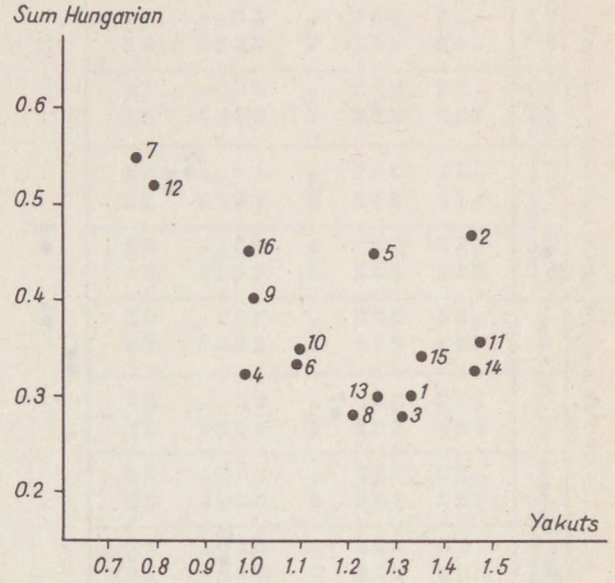


Fig. 4 The arrangement of Hungarian groups according to the middle taxonomical distance from Yakuts and the Sum Hungarian (see the names of 1-16 groups in Fig. 1)

A Természettudományi Múzeum kiadványai
Publications of the Hungarian Natural History Museum
Publikationen des Ungarischen Naturwissenschaftlichen Museums
Publications du Musée Hongrois des Sciences Naturelles

ANNALES HISTORICO-NATURALES MUSEI NATIONALIS HUNGARICI
FOLIA ENTOMOLOGICA HUNGARICA
VERTEBRATA HUNGARICA
MISCELLANEA ZOOLOGICA HUNGARICA
STUDIA BOTANICA HUNGARICA
FRAGMENTA MINERALOGICA et PALAEONTOLOGICA
ANTHROPOLOGIA HUNGARICA
FRIVALDSZKYA

A kiadványok magyar, angol, német, francia és orosz nyelven közölnek értekezéseket. Belföldi személyek és intézmények számára megrendelhetők a Természettudományi Múzeum Könyvtáránál (1088 Budapest, Baross u. 13), külföldi személyek és intézmények számára a "Kultura" Külkereskedelmi Vállalatnál (1389 Budapest 62. Postafiók 149) vagy annak külföldi képviseleteinél és bizományosainál.

The publications contain papers in Hungarian, English, German, French and Russian. Distribution is effected by

"Kultura" Hungarian Foreign Trading Company
H-1389 Budapest 62, P.O.B. 149. Hungary

Orders should be sent to the above address directly or placed through international booksellers.

Die Publikationen enthalten Abhandlungen in ungarischer, englischer, deutscher, französischer und russischer Sprache. Vertrieb erfolgt durch

"Kultura" Ungarisches Aussenhandelsunternehmen
H-1389 Budapest 62, Postfach 149. Ungarn

Bestellungen sind an obige Anschrift direkt zu richten oder durch internationale Buchhändler zu erteilen.

Les publications contiennent des traités en langues hongroise, anglaise, allemande, française et russe. Diffusées par

"Kultura" Société Hongroise pour le Commerce Extérieur
H-1389 Budapest 62, P.O.B. 149. Hongrie

Les commandes peuvent être envoyées directement, ou bien par l'entremise des librairies internationales à la susdite adresse.