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Anthropology of postglacial historic populations

By

T. TÓTH

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Abstract. A brief survey of the paleoanthropological investigations carried out in Hungary during the last three decades. The list of a number of publications is also given.

The great success of the anthropological investigations, carried out on the osteological remains of historical populations which lived in the sequences of the postglacial geologic (Holocene) periods, has been convincingly demonstrated by the general paleoanthropological literature of the last three decades, including also some syntheses. The investigations have been made possible first of all by the establishment of paleoanthropological collections originating from different regions of the Eurasian continent.

From the osteological remains of skeletalized populations which lived in the different postglacial periods of mankind there arose a very rich collection also from the territory of the Central Danubian basin; it became possible to make territorial and epochal comparisons on this basis. In the last decades a significant part of the material kept in central and county collections of Hungary (Anthropological Department of the Hungarian Natural History Museum, Budapest, Anthropological Institute of the University JATE, Szeged, as well as in Debrecen, Eger, Pécs, Székesfehérvár, Veszprém) a total of finds of some 12 000 individuals, have been studied and the results published in about 270 papers in Hungarian and in foreign publications abroad, as well as presented at conferences, congresses or symposia.

A preponderant majority of the subjects of the investigations derived from cranioscopic and craniometric analyses. In addition to the papers mentioned above nearly twenty inaugural dissertations (rerum naturalium), three candidate dissertations of an academic degree (LIPTÁK 1956, TÓTH 1958, FARKAS 1975) and two academic doctorate theses (LIPTÁK 1967, TÓTH 1974) have been prepared on the basis of the materials preserved in our collections. In these craniologic investigations two different methodological conceptions found their expression. In a significant part of the papers the practice of the investigations has been mainly determined by individual typology (LIPTÁK 1957, 1959), but it cannot be regarded as identical in every case with individual diagnosis. Another part of the publications is characterizable by the microevolutionary morphological outlook using comparative group-diagnosis (TÓTH 1958, 1970). As well known the essence of the individual typology includes the demonstration of the elements of different taxa displayed by the skeletons under discussion, that is, per individual. This may be an unavoidable part of the analysis of the paleoanthropological finds, irrespectively whether we are evaluating singular morphologic features or their complexes on the individuals of different skeletalized populations. In the early periods of this trend of the possibility of the identification of the morphological character complexes with the different taxa was not unambiguously clear. There is no doubt that the individual diagnosis is unavoidable in the elaboration of the finds nor can the relevance of the individual-typological determination be disclaimed in connection with skeletalized populations. Nevertheless its extreme variant, i. e. the quantitative (percental) determination of the frequency of type-elements furnish

only a small, if any, information about the anthropological composition of the given individuals. In other words, the frequency of the different morphologic pecularities expressed in percentage cannot be regarded as identical with the components or elements of the different taxa. It means that whereas the definition of the morphoscopic or morphometric data in percentage is equally possible or required in the elaboration of the finds, there is no need for the percental expression of the type-elements per individual. This methodological interpretation can be wholly accepted, if the taxonomically different diagnostic suitability of the morphological traits nas been taken into consideration: they evolved in areals which had phylogenetically different extensions (continents, subcontinents, smaller territorial entities: regions, subregions, microregions) and in different millennia.

Beside the unaltered practice of the individual-diagnosis the caution in connection with the typological evaluation per individual became more and more predominant in the last years. Nevertheless, we can obtain a more complete taxonomic picture in the analysis of morphologic features which take into consideration as well the character-complexes as the group-values.

During the last thirty years another trend became more and more usual in the paleoanthropological investigations in Hungary to adopt the comparative group-diagnosis, with due attention to the areality of certain character-complexes in the microevolutionary morphologic conception. The comparative analysis of the osteological remains from the different millennia became necessary, especially with respect to morphologic character-complexes. All this with regard to the fact that the complexes of traits characterize not only individuals, but whole groups of different populations. Hereby it became possible to recognize the morphogenetic trends with respect to the different subcontinents (TÓTH 1966, 1977a, b, 1978, 1982a). This was the reason why efforts have been made to analyse the diagnostic suitability of the cranial-index, the bizygomatic-breadth, the fossa canina, the malar-bone's convexity and the incisura maxillo-malare as well as the epochal changes of given morphologic traits. The outlining of the possible phases of the ethnogenesis and the delimitation of the components from the main continental taxa (Europoids and Mongoloids) in the anthropological composition of skeletalized populations which inhabited the Central Danubian basin (TÓTH 1970), being one of the most important aims of paleoanthropological investigations, an analysis of the length of time became also unavoidable, the period in which an assimilation took place on craniologic series, the different millennia, originating from the main contact zone of the Eurasian continent. The distinction of the subcontinental components (southern and northern ones) (TÓTH 1971), within the area of the Europoids could not be avoided. All of these observations find their realization in the analysis of the territorial and chronologic distribution of morphologic complexes on the neuro- and splanchnocrania. The same can be stated in connection with the two main morphologic phenomena of the microevolutionary modifications, i.e. brachycephalization and gracilization (TÓTH 1966, 1974, 1977a, b, 1982a). The use of the areality principle made possible a more realistic outlining of the early periods in the ethnogenesis of Hungarians (TÓTH 1974, 1983).

Although the particular papers and the majority of the different postgradual dissertations (LIPTÁK 1957, 1967, 1983; TÓTH 1958, 1974) related to the anthropological problems of our people's origin, a further important synthesis was the dissertation in which the paleoanthropology of the ancient period from the southern parts of the Great Hungarian Plain has been discussed (FARKAS 1975). This dissertation contains the results of the investigations concerning the osteological remains of the populations from the Neolithic, Copper and Bronze ages. Mention must be made of the paleodemographic paper based on a significant part of the Hungarian skeletal collections (ACSÁDI & NEMESKÉRI 1970) in which a wide-ranging evaluation of the problems of human life-span and mortality has been made.

On the other hand the first significant surveys of the anthropological characteristics of the populations of the Copper age (NEMESKÉRI 1956), Celts (NEMESKÉRI & DEÁK 1954) and Sarmatian (BARTUCZ 1961) populations in the Central Danubian basin have been made at the beginning of the last three decades.

Dissertations have been submitted about the systematic serological examinations on the osteological remains from historical populations to obtain the Academic date and doctorate degrees (LENGYEL 1975, 1982); by this a new approach of the essentials of the paleodemographic phenomena as well as of the population genetics of certain tribal groups became possible.

In the comparative anthropological evaluation of the find-groups from the Avar and Arpadian ages some new statistic methods have been introduced (BOTTYÁN 1966, 1967; DEZSŐ 1966; ÉRY 1970, 1983; FERENCZ 1980-1981, 1982-1983; PAP 1978-1979a, b, 1980-1981; TÓTH 1972, 1973; WENGER 1978-1979).

We have to note that with reference to the early periods and possible area of our people's ethnogenesis significant additional information was furnished by the comparative somatologic, dermatoglyphic and odontologic studies, all of which are parts of the ethnical anthropology (TÓTH 1974, 1979, 1980-1981, 1981, 1982b). In the craniomorphologic analysis on an Avar-period population special attention was given to the shovel-shapedness (DEZSŐ 1968). A comprehensive survey has been prepared about the dental caries of prehistoric populations which lived in the Central Danubian basin (SCHRANZ & HUSZÁR 1962). Beside this work an important stomatologic synthesis has been elaborated about the abrasion of the teeth including the data from skeletalized populations (HUSZÁR 1976).

Paleopathology (DERUMS 1978; ORTNER & PUTSCHAR 1981; ROKHLIN 1965; SJÖVALL 1939; STEINBOCK 1976) developed in the last three decades (especially in the literature abroad) as one of the disciplinary components of paleoanthropology. On the basis of a rich collection originating from the territory of Hungary, the hygienic condition of four Arpadian-age populations was studied (NEMESKÉRI & HARSÁNYI 1959) and by the use of some finds from the past millennia a system of different pathologic lesions could be elaborated (BARTUCZ 1966, REGÖLY-MÉREI 1962). Special attention was given to the frequency of some discontinuous craniomorphologic character-variants or anomalies (FARKAS 1974, FARKAS and MARCSIK 1975, WENGER 1974a, b). The paleopathologic investigation of Avar-age populations from the Danube-Tisza interfluvial (MARCSIK 1978, 1983), has been finished only recently, as one of the first syntheses to obtain an academic candidate's degree. Paleosomatologic studies, started in the near past, had as their subject not only the determination of stature from skeletal populations, but the reconstruction of the body weight, too; in this way additional information could be obtained about their over- to undernourished state, their past biological constitution as well as the past economico-environmental conditions (LOTTERHOF 1976, 1977, 1978; PAP 1982, 1982-1983a, b, 1983, 1984; TÓTH 1984, 1985). As an immediate preliminary, all of the above-mentioned Hungarian investigations had the use of the wide-ranging osteometric working-programme of the postcranial skeletal parts for the evaluation of some somatomorphologic (constitutional) peculiarities of two South Transdanubian Avar-age populations (TAJTI & TÓTH 1976-1977).

All of these paleopathologic, paleoserologic and paleosomatologic aspects discussed above contributed to the disciplinary enrichment and further development of paleoanthropology (and in general to that of classical anthropology) by the many-sided analyses of the postcranial parts of human skeletons. The investigations carried out in Hungary seem to have contributed significantly to the results of universal paleoanthropology, to the increase of the interdisciplinary effectiveness of anthropology.

Note. This paper was presented on 1 April 1985 at the scientific meeting held on the occasion of Prof. L. Bartucz's Birth-day Centennary at the Hungarian Academy of Sciences.

REFERENCES

ACSÁDI, Gy. & NEMESKÉRI, J. (1970): History of human life span and mortality. - Akadémiai Kiadó, Budapest, 356 pp.

BARTUCZ, L. (1961): Anthropologische Beiträge zur I. and II. Periode der Sarmatenzeit in Ungarn. - Acta Archaeol. Hung., 13: 157-229.

BARTUCZ, L. (1966): A praehistoricus trepanáció és orvostörténeti vonatkozásu sirleletek (Palaeopathologia III. kötet) (Die prähistorische Trepanation, Funde mit medizinisch-historischen und paläopathologischen Beziehungen in Ungarn (Paläopathologie, Band III)). Országos Orvostörténeti Könyvtár és Medicina Kiadó, Budapest, 612 pp.

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

BOTTYÁN, O. (1967): Data to the anthropology of the Hun Period population in Hungary. - Annls hist.-nat. Mus. natn. hung., 59: 455-464.

DEZSŐ, Gy. (1966): A population of the Scythian Period between the Danube and Tisza. - Anthrop. hung., 7: 35-83.
DEZSŐ, Gy. (1968): Bágyogszovát avarkori népességének embertani elemzése (An antropological analysis of the Avar Period population of Bágyogszovát). - Arrabona (Győr), 10: 79-92.
DERUMS, V. (1978): State of health of the population and healing in the Ancient Baltic. - Zinatne, Riga (in Latvian), 244 pp.
ÉRY, K. (1970): Összehasonlító biometriai vizsgálatok VI-XII. századi Közép-Duna medencei népességek között (Comparative biometrical examinations in 6th-12th century populations of the Middle-Danubian Basin). - Anthrop. közl., 14: 7-34.
ÉRY, K. (1983): Comparative statistical studies on the physical anthropology of the Carpathian Basin population between the 6-12th centuries A.D. - Alba Regia, 20: 89-141.
FARKAS, Gy. (1974): Observed cases of os malare bipartitum in Hungarian paleoanthropological finds. - Acta biol., 20: 183-190.
FARKAS, Gy. (1975): A Dél-Alföld őskorának paleoantropológiája. - Kandidátusi értekezés (Paleoanthropology of the Prehistoric Age in the Hungarian South-Great Plain. Candid. dissertation). Szeged, 478 pp.
FARKAS, Gy. & MARCSIK, A. (1975): Anatomical variations and palaeopathological observations in prehistoric series. - Acta biol., 21: 147-163.
FERENCZ, M. (1980-1981): Some data to the paleoanthropology of the Avar Period's population in Hungary. - Anthrop. hung., 17: 23-64.
FERENCZ, M. (1982-1983): The Avar-age cemetery at Solymár. - Anthrop. hung., 18: 9-41.
HUSZÁR, Gy. (1976): A fogkopás vizsgálatának ujabb módszerei és ezek alapján végzett összehasonlító értékelések eredményei. - Doktori értekezés tézisei (Results of comparative investigations of abrasion using new methods. Doct. theses). - Budapest, 14 pp.
LENGYEL, I. (1975): Paleoserology. Blood typing with the fluorescent antibody method. - Akadémiai Kiadó, Budapest, 240 pp.
LENGYEL, I. (1982): Paleoszerológiai vizsgálatok eredményeinek populációs genetikai értékelése. - Doktori értekezés tézisei (Population-genetic evaluation of the result of paleoserological investigations, Doct. theses). - Budapest, 128 pp. + Appendix.
LIPTÁK, P. (1957): Awaren und Magyaren im Donau-Theiss Zwischenstromgebiet. - Acta Arch. Acad. Sci. Hung., 8: 199-268.
LIPTÁK. P. (1959): The "Avar Period" mongoloids in Hungary.- Acta Arch. Acad. Sci. Hung., 10: 251-279.
LIPTÁK, P. (1967): A magyarság etnogenezisének paleoantropológiája. - Doktori értekezés (Paleoanthropology of the Hungarian ethnogenesis. Doct. diss.). - Szeged, 290 pp.
LIPTÁK, P. (1983): Avars and ancient Hungarians. - Akadémiai Kiadó, Budapest, 208 pp.
LOTTERHOF, E. (1976): On the problem of gracilization in the Central Danubian Basin, I. - Annls hist.-nat. Mus. natn. hung., 68: 321-332.
LOTTERHOF, E. (1977): On the problem of gracilization in the Central Danubian Basin, II.- Annls hist.-nat. Mus. natn. hung., 69: 357-360.
LOTTERHOF, E. (1978): On the problem of gracilization in the Central Danubian Basin, III.- Annls hist.-nat. Mus. natn. hung., 70: 369-371.
MARCSIK, A. (1978): Comparative evaluation of pathological avar findings between the Danube and Tisza rivers. - Acta biol., 24: 143-150.
MARCSIK, A. (1983): A Duna-Tisza köze avar korának paleopatológiája. Kandidátusi értekezés (Paleopathology of the Avar Age in the Danube-Tisza Interfluvial. Candid. dissertation). - Szeged, 141 pp.
NEMESKÉRI, J. (1956): Anthropologische Übersicht des Volkes der Péceler Kultur. - In: Banner, J., Die Péceler Kultur. - Arch. hung., 35: 295-314.
NEMESKÉRI, J. & DEÁK, M. (1954): A magyarországi kelták embertani vizsgálata (Analyse anthropologique des Celtes de la Hongrie). - Biol. közl., 2: 133-158.
NEMESKÉRI, J. & HARSÁNYI, L. (1959): Die Bedeutung paleopathologischer Untersuchungen für die historische Anthropologie. - Homo, 10: 203-226.
ORTNER, D.J. & PUTSCHAR, W.G.J. (1981): Identification of pathological conditions in human skeletal remains. - Smithsonian Contributions to Anthropology. 28., Washington, 479 pp.
PAP, I. (1978-1979a): Data on the anthropology of the population of North-East Transdanubia. - Anthrop. hung., 16: 5-76.

PAP, I. (1978-1979b): Data to the anthropology of the Arpadian Age population of the Plain between rivers Danube and Tisza. - Anthrop. hung., 16: 77-116.
PAP, I. (1980-1981): Anthropological investigation of the Arpadian Age population of Szabolcs-Petőfi utca. - Anthrop. hung., 17: 65-107.
PAP, I. (1982): Untersuchung des Römischen und Awarenzeitlichen anthropologischen Materials im Gräberfeld Pilismarót, Öregek-dülő (1973-1974). - Mitteil. des Archaeologischen Inst. der Ung. Akad. der Wissenschaften, 10/11. (1980/81): 163-182.
PAP, I. (1983): Data to the problem of artificial cranial deformation, Part 1. - Annls hist.-nat. Mus. natn. hung., 75: 339-350.
PAP, I. (1982-1983a): Anthropological investigation of a postcranial series from the Arpadian age (Nagykőrös, Hungary). - Anthrop. hung., 18: 65-74.
PAP, I. (1982-1983b): The elaboration of the anthropological material of the cemeteries Tímár I and Tímár II. - Anthrop. hung., 18: 53-64.
PAP, I. (1984): Data to the problem of artificial cranial deformation, Part 2. - Annls hist.-nat. Mus. natn. hung., 76: 335-350.
REGÖLY-MÉREI, Gy. (1962): Az ősemberi és későbbi emberi maradványok rendszeres kórbonctana. (Palaeopathologia II. kötet) (Systematic pathology of the prehistoric and historical human remains) (Palaeopathology II)). - Országos Orvostörténeti Könyvtár és Medicina Kiadó, Budapest, 228 pp.
ROKHLIN, D.G. (1965): Diseases of ancient men (Bones of the men of various epochs - Normal and pathological changed). - Nauka, Moscow-Leningrad, 303 pp. (in Russian).
SCHRANZ, D. & HUSZÁR, Gy. (1962): Caries findings on prehistoric human dentitions from Hungary. - Z. Morph. Anthrop., 52: 141-154.
SJÖVALL, E. (1939): Die Beziehungen der Palaeopathologie zur Anthropologie. - II. Congr. Int. des Sci. Anthrop. et Ethnol., 1938. Copenhagen, 122-123.
STEINBOCK, R.T. (1976): Paleopathological diagnosis and interpretation. Bone diseases in ancient human populations. - Charles C. Thomas, Springfield, Illinois, 423 pp.
TAJTI, Zs. & TÓTH, T. (1976-1977): Adatok Délkelet-Dunántul avarkori népességének embertanához (Data to the anthropology of the Avar Period population of the South-Eastern Transdanubia). - Anthrop. hung., 15: 5-124.
TÓTH, T. (1958): Profilation horizontale du crâne facial de la population ancienne et contemporaine de la Hongrie. (Problème de l'origine des Hongrois). - Crania hung., 3: 3-126.
TÓTH, T. (1966): The period of transformation in the process of metisation (A paleoanthropological sketch). - Annls. hist.-nat. Mus. natn. hung., 58: 469-487.
TÓTH, T. (1970): Ob udelnom vese mongoloidnyh elementov v naselenii Avarskogo Kaganata (Proportion of the Mongoloid elements in the Avar Khaganat's inhabitants). - In: Tot, T.A. & Firshtein, B.V.: Avary i Sarmaty. Leningrad, 5-68.
TÓTH, T. (1971): On the morphological modification of anthropological series in the Lithic and Paleometallic Ages II. - Annls hist.-nat. Mus. natn. hung., 63: 401-408.
TÓTH, T. (1972): On the importance of the analysis of morphological modifications in palaeoanthropology. - In: Törő, I. et al., Advances in the biology of human populations. Budapest, Akadémiai Kiadó, 463-472.
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): Somatologiya i paleoantropologiya naseleniya Vengrii.- Doktori disszertáció, I-II. (Somatology and paleoanthropology of the Hungarians. Doct. dissertation, I-II). - Budapest, 649 pp.
TÓTH, T. (1977a): Neolithic and paleometallic populations in the Central Danubian Basin. - Annls hist.-nat. Mus. natn. hung., 69: 347-356.
TÓTH, T. (1977b): Morfogenetikai trendek az őskori Közép-Duna medencében (On the morphogenetic trends in the Central Danube Basin during the Prehistoric Age). - Anthrop. közl., 21: 31-42.
TÓTH, T. (1978): On the morphogenetic trends in the prehistoric Eastern Mediterranean. - Annls hist.-nat. Mus. natn. hung., 70: 359-368.
TÓTH, T. (1979): Some problems in the somatology of Hungarian people. - Annls hist.-nat. Mus. natn. hung., 71: 315-319.
TÓTH, T. (1980-1981): Anthropological results concerning the ethnogenesis of Hungarians. - Anthrop. hung., 17: 5-22.

TÓTH, T. (1981): The odontological aspect in the ethnogenesis of Hungarians, I. - Annls hist.-nat. Mus. natn. hung., 73: 305-312.
TÓTH, T. (1982a): Some anthropological problems of the Neolithic Tisza-Basin population. - Annls hist.-nat. Mus. natn. hung., 74: 359-364.
TÓTH, T. (1982b): The odontological aspect in the ethnogenesis of Hungarians, II. - Annls hist.-nat. Mus. natn. hung., 74: 351-357.
TÓTH, T. (1983): Areality in the Early Period of Hungarian ethnogenesis. - Annls hist.-nat. Mus. natn. hung., 75: 351-360.
TÓTH, T. (1984): Some anthropological problems of the Mesolithic Europoids, I. - Annls hist.-nat. Mus. natn. hung., 76: 323-334.
TÓTH, T. (1985): Some anthropological problems of the Mesolithic Europoids, II. - Annls hist.-nat. Mus. natn. hung., 77: 269-279.
WENGER, S. (1974a): Craniomorphological anomalies in the historical populations of the Central Danubian Basin. - Annls hist.-nat. Mus. natn. hung., 66: 413-427.
WENGER, S. (1974b): Anatómiai variációk magyarországi paleoantropológiai leleteken (Anatomical variations in some paleoanthropological finds from Hungary). - Anthrop. közl., 18: 229-233.
WENGER, S. (1978-1979): 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

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Some main problems in the anthropology of North Caspian Proto-Hungarians

By

T. TÓTH

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Abstract. A short summary of the results of the paleoanthropological, odontologic and somatologic investigations published during the last five years. With 2 tables and 3 figures.

Prolegomena. During the five years which passed after the last International Finno-Ugric Congress, the author of the present paper carried out further comparative analyses for studying the craniometric data of skeletal populations originating from the Uralo-Caspian zone (AKIMOVA 1972; ALEXEYEV 1974; EFIMOVA 1981; TÓTH 1983). In the same years the author analysed separately data on the odontologic and main somatologic traits on the basis of data sampled from 28 local (9 ethnogeographic) groups of living Hungarians (TÓTH 1980-1981, 1981, 1982). At the same time the full evaluations of the dermatoglyphic data sampled from the above-mentioned local groups have also been finished (GLADKOVA & TÓTH 1984). The comparative anthropological analysis of skeletal and living populations supplied us with further information concerning the early periods of Hungarian ethnogenesis.

MATERIAL AND METHOD

Any identification of a part of the skeletal populations originating from the Northern Caspian zone needs first a comparative analysis of the paleoanthropological finds from different millennia. The newly excavated craniological series, found in the forest-steppe zones of the European and Asian parts of the Ural Mountains, along the rivers Volga-Kama-Bielaya as well as the Issiet, Irtues and Ishim, further from the Caucasian and Caspian areas, were investigated. We have to mention some particular localities: Tietiushi, Shipovo, Okhlebinino, Kushulevo, Tsamakaberd, Noraduz (from the Early Iron Age), Biliar (from the Late Iron Age), Altuen-Tepe, Gintshi, Ltshashen (from the Bronze Age) (Table 1). Having included the craniometric data of the above-mentioned finds into the investigations, the author analysed the values of the praeauricular-faciocerebral index as well as those of the facial-flatness index. It is well known that these combined complex indices are well-fitted for any comparative analysis of the proportions of the main taxonomic components (Europoid and Mongoloid) (DEBETS 1961, 1964; TÓTH 1974b). For evaluating the craniometric means we have used DEBETS' classification and for uniting the male and female groups the coefficients of the sexual dimorphism calculated by that author (ALEXEYEV & DEBETS 1964). The combined craniological group of the conquering Hungarians have been compared with 48 skeletal series from the Uralo-Caspian zone (Table 1) using the topography of character-complexes (Fig. 1). The interpretations of the data thus obtained needed the evidence of some methodologic aspects (TÓTH 1979, 1980).

The odontoscopic and somatologic characters are very informative sources within the morphological system of living populations. The present paper contains the evaluation of the

morphological features of the lingual surface of the upper medial permanent incisors and that of the chewing surface of the first lower molar. Data about these odontomorphoscopic traits have been sampled from a significant contingent of living Hungarians (more than 3300 men aged between 20 and 60) and compared with twenty ethnogeographic groups of the Eurasian continent (Table 2, Fig. 2). The data concerning the somatoscopic index also deserve attention, because they give information about the main taxonomic components (Europoid and Mongoloid) (Table 2) (TÓTH 1980-1981, 1982). This combined index-value includes data of ten morphoscopic characters (extension of beard, extension of chest hair, frequency of epicanthus, development of proximal part of upper eyelid-plica, eye-slant, horizontal facial profiles, prominence of cheek-bones, nasal root height, upper lip profile, prominence of genial tubercle). The value of this index varies for the mixed Europo-Mongoloid groups between 20 and 60 (TÓTH 1980-1981, 1981).

INTERPRETATION OF RESULTS

Within the above-mentioned 48 skeletalized contingents the morphological differences of the newer series seem clearly expressed against the combined group of the conquering Hungarians (Table 1). In the topography of the two combined complex indices the skeletalized populations may be grouped according to four areas (North Caspian, South Caspian, Ural-Kama-Volga and Ural-Ob regions). A striking similarity of the conquering Hungarians can be stated with the craniological remains of Sauromats and Sarmatas who lived in the North Caspian region (Fig. 1). On the other hand the combined group of conquering Hungarians differs significantly in a morphological respect from the West Siberian and Cis-Uralian craniological finds (Table 1, Fig. 1). It deserves attention that the epochal antecedents of the main morphological traits, which are the most characteristic for the conquering Hungarians, can be found in the paleoanthropologic series from the Lower Volga (Fig. 1). There existed in this region, since the beginning of the Bronze Age, an identical morphological complex characterized by the hypermorphy of the splanchnocranium, by a complex which survived in the local Yamnaya-Poltavkino- and Srubnaya-cultures as well as in the sequences of the Early Iron Age (Table 1). Concerning the correlation of the main taxonomic components in the Central Ob region, the proportion of the Mongoloid component increased during fifteen hundred years (Table 1). On the contrary, the Mongoloid component became in the North Caspian area almost insignificant during the first half of the Iron Age. Nevertheless there is no doubt that the narrow-faced hypomorphic (gracile Eastern Mediterranean) component infiltrated from the Caucasian zone as far as the mouth of the Kama river and the Lake Aral, but this event did not have any modificatory effect in the first half of the Iron Age in the contingent of the populations which inhabited the Northern Caspian area and on the craniomorphological characteristics of the conquering Hungarians. In the Late Iron Age series from Tankeyevka and Biliar the manifestation of the southern gracile Europoid component became well expressed (Table 1). On the other hand the massive eastern Protoeuropoid component became determinative in the craniomorphological complex of the conquering Hungarians.

Concerning the above discussed problems of the ethnogenesis of Hungarians an analysis of certain morphological systems of some living populations render further important information. Two odontoscopic traits were taken first of all into consideration: the morphoscopic pattern of the lingual surface of the upper medial permanent incisors and that of the pattern of the chewing surface of the first lower permanent molar. The examined traits were shovel-shapedness and the distal trigonid crest. Intercontinental comparative analyses carried out formerly have shown that the frequency of shovel-shapedness of the upper medial incisors varies between 0 and 15 per cent in the Europoid populations, whereas the highest frequency of shovel-shapedness has been found among Mongoloids (75-100%) (ZUBOV 1968). Relatively high frequencies (25-55%) can be found not only in the Europo-Mongoloid mixed groups, but also in the southern subcontinental area of the Europoid racial stock. This situation led to the outlining of three odontologic complexes (types) as distinct ones in the Eurasian continent (the northern gracile, the Middle European and the southern gracile) (ZUBOV 1979). According to these statements a relatively high frequency of shovel-shapedness seems characteristic of the southern gracile type. Data about this odontoscopic trait have been sampled from more than 2000 Hungarian men. The other odontoscopic trait, the presence of the distal trigonid crest on the first lower molar, could be analysed in 1239 Hungarian men. According to ear-

lier findings the frequency of this trait is 5 per cent among Europoids, whereas among Mongoloids its frequency values are usually as high as 28-33 per cent (ZUBOV 1973). Nevertheless, on the Indian subcontinent, which belongs in the south-eastern region of the Europoids' area, the frequency of this trait found for the Veddo-Australoid groups is higher (Oraons 46.3%) than among Mongoloids (Table 2). For the whole dental system the differential diagnostic significance of these two patterns proved to be very high (ZUBOV 1967, 1968, 1973). The local groups of the Hungarian contingent studied by us have been combined into 9 ethnogeographic units (Table 2). Concerning the two odontomorphologic patterns the ethnogeographic groups of Hungarian men are very close not only to the Eastern Finns, but to some Central Asian and Caucasian groups as well (Table 2, Fig. 2). Relatively hight frequency values (15-40%) have been found for the trait of shovel-shapedness as well as for that of the distal trigonid crest not only in the metisated groups of Europo-Mongoloids, but in the southern subcontinental area of the Europoid racial stock (including Veddo-Australoids). However, according to the combined somatoscopic index applied by us the ethnogeographic groups of the Hungarian men differ significantly from a number of populations inhabiting Bashkiria, Kazakhstan and Uzbekistan (Table 2) (TÓTH 1980-1981).

Having in mind the parallelisms between the skeletal and living populations, the slow process of the microevolutionary modification as well as the phylogenetic stability and continental or subcontinental specificity of certain morphoscopic characters from the postglacial millennia till the Present cannot be left out of consideration. This seems to have a real actuality in the case of the Ugor origin of the conquering Hungarians' ancestors, too. Nevertheless any comparison of the morphological complexes presented here reveals a well pronounced similarity between the Sauromats, Sarmatas of the Northern Caspian zone and the conquering Hungarians. In this area the Europoid component dominated over the insignificant Mongoloid one already during the Early Iron Age.

A systematic (odontoscopic and somatologic) analysis of certain living populations studied by us affords the establishment of the prevailing majority of the Europoid taxonomic component.

There is no doubt that the wide-ranging archaeological analysis carried out in connection with this problem must also be taken into consideration. The analyses have thoroughly documented the intensive tribal connections which had existed in the second half of the Bronze Age and in the first one of the Iron Age in the North Caspian area (SMIRNOV 1964; MOSHKOVA 1969, 1974; SALNIKOV 1967). In the first half of the Iron Age, in about a period of 700 years, the Prohorovo-culture (VII-II. c. BC) amalgamated in the above area (Fig. 3) with an extraordinarily heterogenous tribal composition and similar morphologic complex of population groups. This Caspian region acted doubtless as the crossing-centre of differently directed population movements in the Early Iron Age. A decisive part in the forming of the character-complex of the conquering Hungarians is connected with this chronological period.

On the basis of the results and parallel data outlined above of some other disciplines it seems very probable that the Proto-Hungarians formed part of the Europoid ethnic millieu of the Northern Caspian zone; in general, the Europoid component was the substratic one of the Protougors, too.

Note. This paper was presented on 26 July, 1985 at the Sixth International Finno-Ugric Congress in Syktyvkar.

REFERENCES

AKIMOVA, M.S. (1972): Antropologiya naseleniya lesostepnoi poloshy Zapadnoi Sibiri v epokhu rannego zheleza. Pamyatniki Yuzhnogo Priuralya i Zapadnoi Sibiri sarmatskogo vremeni. - Inst. Archeol. AN SSSR (Moskva), 150-159.

AKIMOVA, M.S. (1977): Matériaux anthropologiques dans le cimetière de Tankeevka. - Studia Archaeol. (Budapest), 6: 223-236.

AKSIANOVA, G.A. (1979): Naselenie basseina Petshori i nizhnei Obi. - In: Zubov, A.A. and Haldeeva, N.I. Etnicheskaya odontologiya SSSR, Moskva, 93-113.

ALEXEYEV, V.P. (1974): Proishozhdenie narodov Kavkaza. - Nauka, Moskva, 317 pp.

ALEXEYEV, V.P. & DEBETS, G.F. (1964): Kraniometriya. - Inst. Etn. AN SSSR, Moskva, 128 pp.

DEBETS, G.F. (1961): O nekotoryh napravleniyakh izmenenii v stroenii chelovieka sovremennogo vida. - Sov. Etnogr., 2: 9-23.
DEBETS, G.F. (1964): Ob antropologicheskom tipe drevnego naseleniya Finlyandii. - In: Sovremennaya Antropologiya, Moskva, 233-239.
EFIMOVA, S.G. (1981): K kraniologii rannego zheleznogo veka Volgo-Kamia. - Quest. Anthrop., 67: 64-73.
FIRSHTEIN, B.V. (1967): Antropologicheskaya kharakteristika naseleniya Nizhnego Povolzhia v epokhu bronzue. - Pamyatniki epokhi bronzy yuga Evropeiskoi chasti SSSR, Kiev, 100-140.
FIRSHTEIN, B.V. (1970): Sarmaty Nizhnego Povolzhia v antropologicheskom osveshchenii.- In: Tóth, T.A. & Firshtein, B.V.: Antropologicheskie danny k voprosy o velikom pereselenii narodov, Avary i sarmaty . - Nauka, Leningrad, 69-202.
GLADKOVA, T.D. & TÓTH, T.A. (1985): Additional data to the dermatoglyphics of Hungarians. - Annls hist.-nat. Mus. natn. hung., 77: 291-300.
KIYATKINA, T.P. (1979): Naselenie Altuen-Tepe v epokhu bronzy. - Izv. AN Turkmenskoi SSR. ser. obsht. nauk. (Ashabad), 6: 9-16.
KOTSHIYEV, R.S. (1979): Zakavkazie i Severnuy Kavkaz.- In: Zubov, A.A. & Haldeeva, N.I., Etnicheskaia odontologiya SSSR, Moskva, 114-141.
MOSHKOVA, M.G. (1969): Progrebenia VI-IV. vv. do n.e. v Tshelabinskoi gruppe kurganov.- Drevnosti Vostotshnoi Evropue, Inst. Archeol. AN SSSR, Moskva, 138-147.
MOSHKOVA, M.G. (1974): Proishozhdenie rannesarmatskoi (Prohorovskoi) kulturue.- Inst. Archaeol. AN SSSR, Moskva, 52 pp.
SALNIKOV, K.V. (1967): Otsherki drevnei istorii Yuzhnogo Urala. - Nauka, Moskva, 408 pp.
SMIRNOV, K.F. (1964): Savromatue. Rannaya istoria i kultura sarmatov. - Nauka, Moskva, 379 pp.
TÓTH, T. (1974a): Somatologiya i paleoantropologiya naseleniya Vengrii. - Doct. dissertation I-II., Budapest, 649 pp. (Manuscript)
TÓTH, T. (1974b): On the Sarmatian Phase in the genesis of Proto-Hungarians. - Central Asia in the Kushan Period (Dushanbe, 1968), Moscow, 1: 210-218.
TÓTH, T. (1977): Somatologiya i paleoantropologiya naseleniya Vengrii.- Doct. thesis, Moskva, 35 pp.
TÓTH, T. (1979): Some factors in the morphological modification of human groups. - Annls hist.-nat. Mus. natn. hung., 71: 321-328.
TÓTH, T. (1980): Some anthropological problems of the Early Postglacial and Historic Europoids.- Annls hist.-nat. Mus. natn. hung., 72: 295-307.
TÓTH, T. (1980-1981): Anthropological results concerning the ethnogenesis of Hungarians.- Anthr. hung., 17: 5-22.
TÓTH, T. (1981): The odontological aspect in the ethnogenesis of Hungarians, I. - Annls hist.-nat. Mus. natn. hung., 73: 305-312.
TÓTH, T. (1982): The odontological aspect in the ethnogenesis of Hungarians, II. - Annls hist.-nat. Mus. natn. hung., 74: 351-357.
TÓTH, T. (1983): Areality in the Early Period of Hungarian ethnogenesis. - Annls hist.-nat. Mus. natn. hung., 75: 351-360.
ZUBOV, A.A. (1968): O rasovo-diagnostitsheskom znatshenii nekotorueh odontologitsheskih priznakov. - Sov. Etnogr., 3: 49-59.
ZUBOV, A.A. (1973): Ethnicheskaiya odontologiya. Moskva, 3-203.
ZUBOV, A.A. (1979): Vvedenie, Zakluchenie. - In: Zubov, A.A. & Haldeeva, N.I., Etnicheskaia odontologiya SSSR, Moskva, 3-8, 229-251.

Author's address: DR. TIBOR TÓTH
Anthropological Department
Hungarian Natural History Museum
Budapest, Bajza utca 39.
H-1062

Table 1 Some comparative indices of the neuro- and splachnocranium (males and females together)

Ethnic groups \ Characteristics	N	Praeauricular facio-cerebral index	Facial flatness index
Hungarians, 10. c. AD. (TÓTH 1968, 1974 a, b)	122	91.5	17.0
Sauromats, Lower Volga, 7-4. BC. summarized (FIRSHTEIN 1970)	41	92.0	18.1
Sarmats, Volgograd-Astrahan groups 4. c. BC. - 4. c. AD. (FIRSHTEIN 1970)	122	91.9	19.6
Sarmats, Saratov region, 4. c. BC. - 4. c. AD. (FIRSHTEIN 1970)	160	91.8	10.7
Sarmats, Cis-Ural, summarized, 4. BC. - 2. c. AD. (FIRSHTEIN 1970)	54	92.6	19.0
Sarmats, Bashkiria, 3-2. c. BC. (AKIMOVA 1968, TÓTH 1974a)	29	92.4	28.9
Tankeyevka, 9-11. c. AD., Central Volga (AKIMOVA 1977, TÓTH 1981)	68	90.6	31.6
Bolshe-Tarkhan, 8-9. c. AD., Central Volga (AKIMOVA 1964, TÓTH 1974a, 1981)	62	90.9	38.3
BILIAR, 10-11. c., Lower Kama (EFIMOVA 1979)	61	88.2	28.6
Late Lomovatovo Period, 6-8. c. (AKIMOVA 1968, TÓTH 1974a)	13	90.7	45.5
Early Lomovatovo Period, 4-5. c. (AKIMOVA 1968, TÓTH 1974a)	12	89.2	25.4
Masunino-cult., 3-7. c. Central Kama (AKIMOVA 1961a, TÓTH 1974a, 1984)	18	90.7	36.5
Birsk, Late Period, 5-7. c., Bashkiria (AKIMOVA 1968, TÓTH 1974a, 1981)	39	91.3	34.5
Birsk, Early Period, 3-4. c. (AKIMOVA 1968, TÓTH 1974a, 1981)	18	91.0	42.4
Okhlebinino, 1.4. BC. - 2. c. AD., Bashkiria (EFIMOVA 1981)	21	89.7	34.6
Kushulevo, 2. BC. - 1. c. AD., Bashkiria (EFIMOVA 1981)	36	89.7	37.8
Pianobor cult., 2. c. BC. - 3. c. AD., Central Kama (AKIMOVA 1961b, TÓTH 1974a)	24	90.3	35.3
Shipovo, 4. c. - 3. c. BC., Bashkiria (EFIMOVA 1981)	11	89.3	42.1
Kamyshlue-Tamak, 1. c. BC. - 2. c. AD., Bashkiria (AKIMOVA 1968, TÓTH 1974a)	29	89.8	27.6
Biktimirovo, 3-2. c. BC., Bashkiria (AKIMOVA 1968, TÓTH 1974a)	13	90.2	32.9
Tietiushi, 8-6. c. BC., Central Volga (EFIMOVA 1981)	8	90.0	46.2
Lugovo, 8-3. c. BC., Lower Volga (TROFIMOVA 1968, TÓTH 1974a)	23	93.4	55.3
Polianka II., 10-8. c. BC., Early Ananino cult. (ALEXEYEV 1969)	12	91.5	36.4
Issiet river, 6-2. c. BC., Trans-Ural (AKIMOVA 1972)	10	93.6	49.5

Table 1 (Cont. 1)

Ethnic groups \ Characteristics	N	Praeauricular facio-cerebral index	Facial flatness index
Irtues river, 4. c. BC. -2. c. AD., Trans-Ural (AKIMOVA 1972)	17	92.7	38.4
Ishim river, 2. c. BC. -2. c. AD., Trans-Ural (AKIMOVA 1972)	18	91.7	34.6
Central Ob, 7-10. c. AD. (Rozov Dremov 1966, TÓTH 1981)	35	93.6	59.6
Central Ob, 11-8. c. BC. (Dremov 1967, TÓTH 1974a, 1981)	15	94.8	34.7
Sialk B., Iran, Early Iron Age (VALLOIS 1940, DEBETS 1960, TÓTH 1974a)*	17	92.3	11.6
Saka, Lake Aral, 4-1. c. BC. (TROFIMOVA cit. by KIYATKINA 1965, TÓTH 1974a)	18	89.1	30.7
Saka, Kazakhstan, 7-4. c. BC. (ISMAGULOV 1965, TÓTH 1974a)	53	93.6	22.2
Mingetshaur II., 7-5. c. BC., Azherbaidz-han (KASIMOVA 1956, TÓTH 1974a)	14	89.5	-1.8
Mingetshaur IV., 2. c. BC. -2. c. AD. (KASIMOVA 1956, TÓTH 1974a)	8	89.5	4.9
Mingetshaur VI., 1-7. c. AD. (KASIMOVA 1956, TÓTH 1974a)	61	89.8	-5.8
Koban-cult., 11-6. c. BC., North Caucasus (ALEXEYEV 1974)	19	88.6	-4.0
Tsamakaberd+Noraduz, 12-6. c. BC., South Caucasus (ALEXEYEV 1974)	24	91.3	-19.0
Altuen-Tepe, Bronze Age, Turkmenia (KIYATKINA 1979)	51	88.7	-5.8
Koktsha III., Late Bronze Age, South Aral (TROFIMOVA 1961, TÓTH 1974a)	24	88.7	3.5
Tepe-Hissar III., Bronze Age, Iran (KROGMAN 1940, DEBETS 1957, TÓTH 1974a)**	136	89.1	-1.9
Ltshashen, Bronze Age, Lake Sevan (ALEXEYEV 1974)	84	90.6	-14.1
Gintshi, Late Bronze Age, Daghestan*** (ALEXEYEV 1974)	20	88.2	-22.3
Yamnaya-cult., Bronze Age, Lower Volga (FIRSHTEIN 1967, TÓTH 1974a)	28	91.2	-0.1
Poltavkino-cult., Bronze Age, Lower Volga (FIRSHTEIN 1961, TÓTH 1974a)	24	90.1	-8.7
Srubnaya-cult., Bronze Age, Lower Volga (FIRSHTEIN 1961, TÓTH 1974a)	57	90.7	-8.8
Andronovo-cult., West Kazakhstan (ALEXEYEV 1967, TÓTH 1974a)	30	90.2	-10.9
Andronovo-cult., North Kazakhstan (ALEXEYEV 1967, TÓTH 1974a)	10	88.8	-2.8
Andronovo-cult., Central Kazakhstan (ALEXEYEV 1967, TÓTH 1974a)	9	92.9	23.0
Andronovo-cult., East Kazakhstan (ALEXEYEV 1967, TÓTH 1974a)	9	92.1	16.7
Turks, Kazakhstan, 6-12. c. AD. (ISMAGULOV 1965, TÓTH 1974a)	78	94.4	40.1

Table 1 (Cont. 2)

Characteristics / Ethnic groups	N	Praeauricular facio-cerebral index	Facial flatness index
Europoids, Northern zone, SU, Bronze Age (DEBETS 1961, TÓTH 1974a)	215	90.2	2.0
Europoids, Southern zone, SU, Bronze Age (DEBETS 1961, TÓTH 1974a)	91	89.1	-8.3
Europoids, Northern zone, SU, Iron Age (DEBETS 1961, TÓTH 1974a)	471	90.7	7.7
Europoids, Southern zone, SU, Iron Age (DEBETS 1961, TÓTH 1974a)	105	89.6	-5.9
Mongoloids, SU, Neolithic-Bronze Age (DEBETS 1961, TÓTH 1974a)	155	97.9	77.2
Mongoloids, SU, Early Iron Age (DEBETS 1961, TÓTH 1974a)	25	97.7	85.8
Europoids, SU, Medieval Epoch (DEBETS 1961, TÓTH 1973, 1974a)	1771	89.9	10.6
Mongoloids, SU, Medieval Epoch (DEBETS 1961, TÓTH 1973, 1974a)	94	98.2	87.7
Europo-Mongoloids, SU, Scythian Period (DEBETS 1961, TÓTH 1973, 1974a)	146	93.2	41.3

* Re-examined and calculated by DEBETS in Paris, in 1960. Manuscript.
** Re-examined and calculated by DEBETS in Philadelphia, in 1957. Manuscript.
*** From males only.

Note. References not given in the list, see in TÓTH (1965-1981).

Table 2 Some comparative data of different morphological systems (males)

Characteristics / Territorial, ethnic groups	Shovel-shaped upper medial incisors (2+3)		Distal trigonid crest, M_1		Somatoscopic index	
	N	%	N	%	N	M*
Mongols (Mongolia, Zolotaryeva; ZUBOV, 1973)	273	90.4	212	32.1	-	-
Kazakhs (ZUBOV 1973)	131	62.6	317	22.6	-	-
Koreans (ZUBOV 1973)	79	66.6	79	44.4	-	-
Santals (East India; ZUBOV 1973)	72	57.0	72	31.9	-	-
Munda (East India; ZUBOV 1973)	39	56.4	27	37.0	-	-
Oraons (East India; ZUBOV 1973)	65	58.4	69	46.3	-	-
Upland Mari (ZUBOV 1973)	105	20.0	95	13.8	-	-
Meadow Mari (ZUBOV 1973)	110	21.8	93	18.2	-	-
Komi (Izhem district; AKSIANOVA 1979)	129	17.0	53	1.9	-	-
Komi (Southerns; AKSIANOVA 1979)	79	20.2	43	2.3	-	-
Khantis (Northerns; AKSIANOVA 1979)	62	54.8	31	3.2	-	-
Mansis (Northerns; AKSIANOVA 1979)	162	52.5	70	7.1	-	-
Hungarians (summarized; TÓTH 1977, 1981, 1982)	2219	17.8	1239	12.3	3310	13.4
Őrség (South-West; TÓTH 1977, 1981, 1982)	59	6.8	25	8.0	115	9.2
Göcsej (South-West; TÓTH 1977, 1981, 1982)	426	11.4	208	21.1	634	18.5
Rábaköz (North-West; TÓTH 1977, 1981, 1982)	143	20.0	61	4.9	247	7.1
Nagykunság (Tisza-Basin; TÓTH 1977, 1981, 1982)	235	15.2	130	20.0	387	12.3
Jászság (Tisza-Basin; TÓTH 1977, 1981, 1982)	250	26.1	152	19.1	337	17.4
South Palócság (+Matyó; TÓTH 1977, 1981, 1982)	207	27.9	111	6.3	291	9.9
North East Palócság (TÓTH 1977, 1981, 1982)	350	22.4	225	2.7	540	13.9
Taktaköz (North Hungary; TÓTH 1977, 1981, 1982)	360	14.8	219	11.8	448	12.2
Szamoshát (N-E Hungary; TÓTH 1977, 1981, 1982)	189	15.5	108	9.2	311	10.8
Tadjiks (Tshust; ZUBOV 1973)	129	20.5	129	9.2	-	-
Tadjiks (summarized; ZUBOV 1979)	910	15.9	717	4.0	-	-
Tadjiks (Gantshi; ZUBOV 1979)	113	27.4	76	4.0	-	-
Tadjiks (Sanghardak; ZUBOV 1979)	104	19.2	73	4.0	-	-
Osset-Dzhava (KOTSHIEV 1979)	109	1.8	94	5.3	-	-
Gudjars (North India; ZUBOV 1973)	108	5.5	101	5.9	-	-
Radjputs (North India; ZUBOV 1973)	84	9.5	96	12.5	-	-
Tshamars (North India; ZUBOV 1973)	120	7.5	100	19.0	-	-

*Summarized means from ten morphoscopic characters (TÓTH 1979).

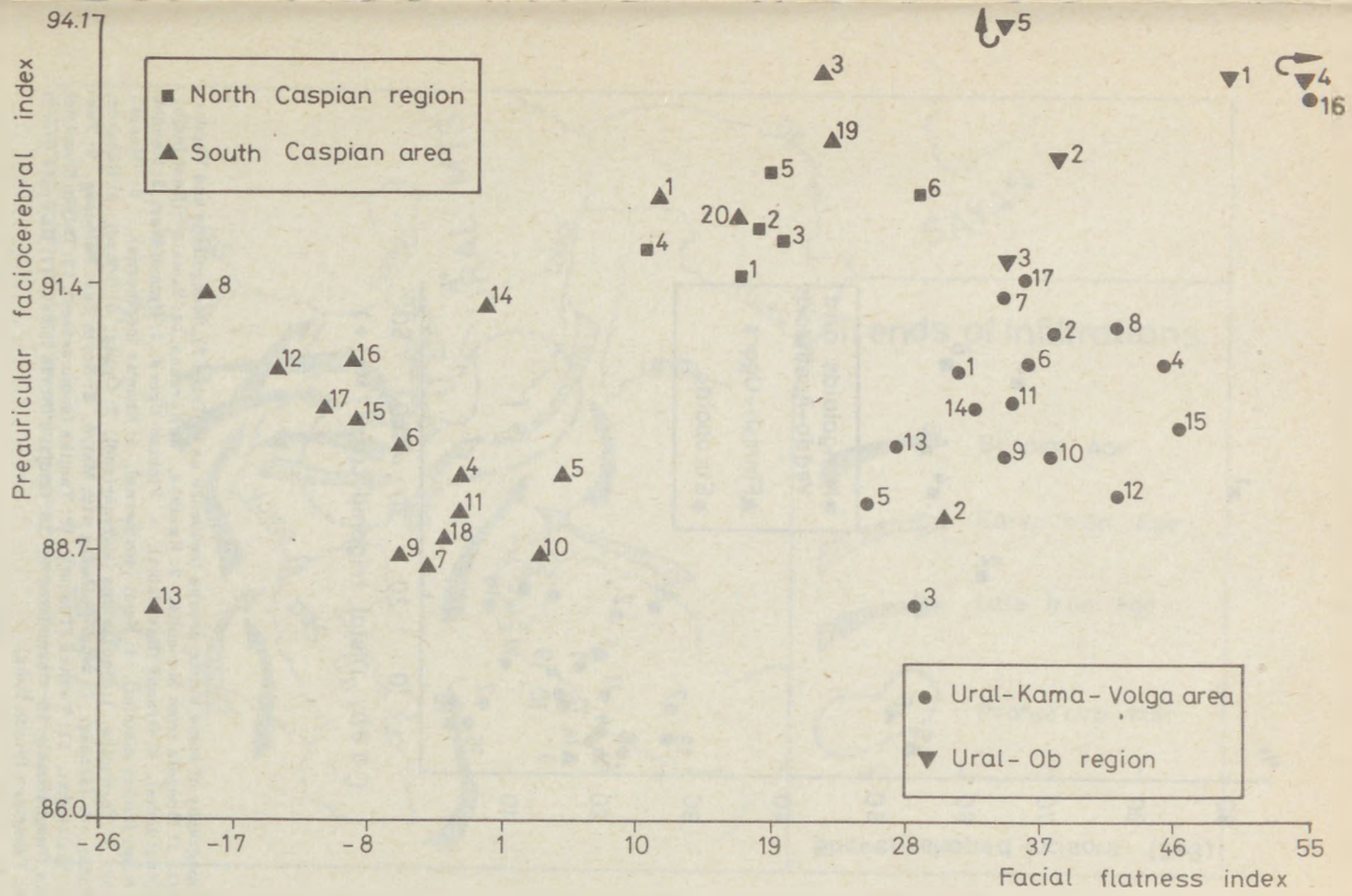

Fig. 1 Topography of craniological series (sequence as in Table 1). North Caspian region. 1-6: from Hungarians to Sarmats, Bashkiria. - Ural-Kama-Volga area. 1-17: from Tankeyevka to Polianka II. - Ural-Ob region. 1-5: from Issiet river to Central Ob. - South Caspian area. 1-20: from Sialk B. to Andronovo cult., East Kazakhstan

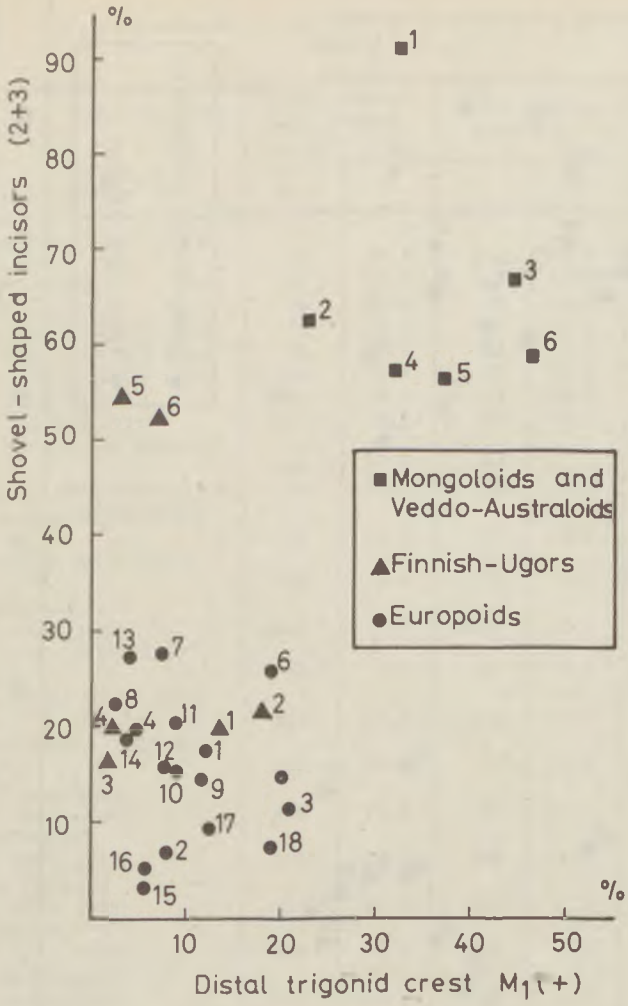

Fig. 2 Topography of some ethnic groups (sequence as in Table 2). Mongoloids and Veddo-Australoids. 1: Mongols from Mongolia, 2: Kazakhs, 3: Koreans, 4: Santals (East India), 5: Munda (East India), 6: Oraons (East India). - Finnish-Ugors. 1: Upland Mari, 2: Meadow Mari, 3: Komi (Izhem district), 4: Komi (southerns), 5: Khantis (northerns), 6: Mansis (northerns). - Europoids. 1: Hungarians (summarized), 2: Őrség, 3: Göcsej, 4: Rábaköz, 5: Nagykunság, 6: Jászság, 7: South Palócság with Matyó, 8: North East Palócság, 9: Taktaköz, 10: Szamoshát, 11: Tadjiks (Tshust), 12: Tadjiks (summarized), 13: Tadjiks (Ghantshi), 14: Tadjiks (Sanghardak), 15: Osset-Dzhava, 16: Gudjars (North India), 17: Radjputs (North India), 18: Tshamars (North India)

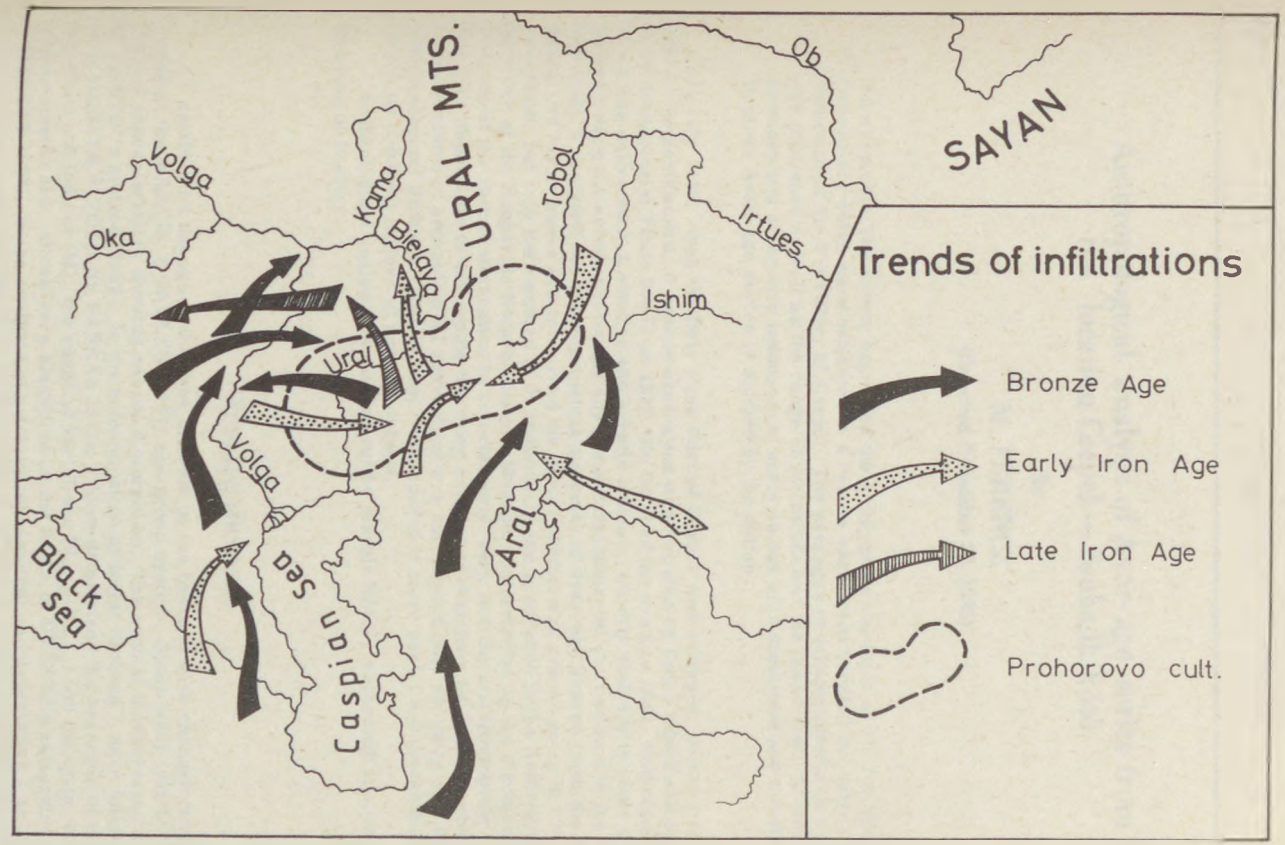

Fig. 3 Principal morphogenetic trends (according to Tables 1-2)

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Anthropological analysis of Avar- age series from the location Csepel – Szabadkikötő

By

M. FERENCZ

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Abstract. The author examined the anthropological finds of 31 7th-8th century individuals which were collected in a rescue excavation carried out during the construction of the Free Port of Csepel. The averages of measurements and indices are published as well as the range of variations and the dispersion. Anomalies, primary and secondary taxonomical analysis are also discussed and the similarity to other Avar-age series is studied by the author.

In July 1938, when the Duty Free Port of Csepel was enlarged, human bones came to light in the earthworks. A rescue excavation was initiated by Lajos NAGY and it was carried on by archeologist Tibor NAGY in 1939. He finished the work in 1940. Anthropological material was collected in a wanting and erratic manner. Chiefly skulls with some interesting features were collected, but hardly any postcranial material can be found in the series. In this study I analysed the anthropological material of Avar-age graves from the 7th-8th centuries. As far as bones are concerned the serial numbers of graves go up to 67 (with Arabic numerals), but only the remains of 31 individuals are preserved in the Anthropological Department of the Hungarian Natural History Museum. Information on the circumstances and methods of the rescue excavation is unfortunately very sketchy and incomplete to the point that it is impossible to determine the exact number of skeletons found in the given area. The grave numbers of archeological grave furniture correspond only partially with those of the anthropological findings. This is why I considered it more useful and unambiguous to publish inventory numbers instead of grave numbers.

Archeological analysis is carried out by Margit NAGY, archeologist of the Budapest Museum of History.

APPLIED METHODS

I established the age at the time of death on the basis of bone changes during life time. I applied the MARTIN & SALLER (1957) age-group system. Sexes were identified by the anatomical characteristics showing sexual dimorphism. The cranial measurements were taken by MARTIN's method (1928). In the determination of facial flatness I have followed the method of DEBETS & TÓTH (in FARKAS 1972). I have determined the averages of individual dimensions and indices (M), the range of variations (V_{min}-V_{max}) and the dispersion (s). The measurements and indices were classified on the basis of DEBETS's categories (ALEXEYEV & DEBETS 1964). In the analysis of primary taxonomical characteristics I proceeded according to the works of DEBETS (ALEXEYEV & DEBETS 1964) and of TÓTH (1958, 1962, 1967, 1968, 1969). I evaluated secondary characteristics according to LIPTÁK's (1954, 1965,

1969) taxonomical system. Stature was determined by MANOUVRIER' method (1892) (according to the tables of MOLLISON 1938) and by the method of BREITINGER (1938) and BACH (1965).

GENERAL CHARACTERIZATION

The remnants of 31 individuals were collected in the process of a rescue excavation. There could be found skeletal bones beside skulls in 16 cases. There were 11 individuals represented only by their skulls and 4 individuals with only some skeletal material (Table 1).

The series brought to light contains 1 Infans I (3.2%) and 1 Infans II (3.2%) age-group children. The number of individuals falling into the age-group Juvenis is 3 (9.7%). Males and females were found in equal numbers (13-13, 41.9%-41.9%). The ratio of males who died in adult and in mature ages is the same, 46.2%. 1 Individual survived to achieve the Senium age (7.7%). 9 females died as adults (69.2%) and 4 females in the mature age (30.8%).

As the series is presumably incomplete we cannot draw demographical conclusions.

There are 27 crania in the series, 10 being male ones, 12 females and 5 are of undetermined sex (children and juvenile ones). 8 male and 8 female skulls are presented in the detailed metric analysis. The morphoscopic analysis was carried out on the fragmentary skulls, too (Table 2).

I had postcranial material at my disposal for 20 cases. Inadequate collecting work and poor, fragmented preservation can be well illustrated by the fact that I could take up measurements necessary for stature calculation only on the remains of 5 individuals (4 males and 1 female). While this female skeleton was found with a similarly intact skull, the male skeletons were found with fragmentary skulls.

ANTHROPOLOGICAL ANALYSIS

I have given the mean-values of individual measurements (Tables 3 and 4) in spite of the small number of cases to facilitate comparison to other Avar-period series.

Considering averages, male brain-cases are medium long, wide and medium high. By the indices these are mesocranic, chameocranic, metriocranic and metriometop.

Females are characterized by their medium long, medium wide, medium high brain-cases according to calculated mean-values (with considerable standard deviation). According to the indices female brain-cases are dolichocranic, hypsicranic, acrocranic (as a result of the presence of one hyperacrocranial skull beside tapeinocranic and metriocanic ones) and metriometop).

The male skull circumference in norma verticalis is sphenoid except one case which is byrsoid. Glabella degrees 4 and 5 is according to Broca. Arcus superciliaris is strong, pronounced. Protuberantia occipitalis externa is medially and strongly developed. Processus mastoideus is markedly developed in most cases. On the lower edge of apertura piriformis fossa praenasalis can be observed in two cases and sulcus praenasalis in one case. On the other skulls this region was fragmented. Spina nasalis anterior was broken down on two-thirds of the skulls, those possible to evaluate are medially developed. The region of fossa canina could be studied on half of all the skulls. Half of the cases presented filled up or very shallow fossae caninae while the other half of them displayed very deep ones. Because the facial region is frequently fragmentary, alveolar prognathism could be evaluated only on two skulls and these had a moderate form. Abrasion of teeth is most frequently medium, in a small number of cases marked.

The female skull circumference in norma verticalis is byrsoid in the great majority and sphenoid. Glabella and arcus superciliaris are weak. Protuberantia occipitalis externa could be analysed in two cases. It was weak on one of the skulls while expressedly strong on the other one. Processus mastoideus is small. Intact apertura piriformis could be found on 4 skulls, sulcus praenasalis could be seen on 3 of them and fossa praenasalis on 1. Fossa canina is generally shallow and of medium depth. The alveolar region was intact on one skull and I found it to be vertical. Abrasion is less pronounced than that of the males,mostly moderate and medium degree (Table 5).

On the average, male stature is small medium according to Manouvrier' s method and

large medium according to Breitinger's calculation, on the basis of the data on 4 male individuals. The only female individual suitable for calculations was of medium stature by Manouvrier's method and tall according to Bach (Table 6). Individual measurements of males are summarized in Table 7 and those of females in Table 8.

ANOMALIES

We cannot form a realistic picture of the frequency of anatomical variations and abnormalities from their percentage within this incomplete series. Owing to this very state of incompletness it would be a mistake to draw conclusions regarding the entire cemetery and this is why I have not presented the percentages of characteristics projected for the series and I also thought it unnecessary to summarize them in any table. The very numerous occurrence of certain variations also seems to justify our presumption that only the more interesting bones have been collected.

For example sutura metopica could be found on 6 individuals (1 Infans II, 2 Juvenis, 2 males - 1 Ad, 1 Mat, 1 female Ad). It is not probable that, contrary to a good number of other results (WENGER (1974) calculated an average of 5.7% for Avar-period series in Hungary, FERENCZ (1983) 7.9% for the cemetery of Solymár), the average occurrence of sutura metopica could be 22.2% in the cemetery of Csepel.

Ossa Wormiana could be found on 7 skulls. It was located with 5 individuals in the sutura lambdoidea, with 1 in the sutura coronalis and with 1 in the sutura sagittalis. I could also find it at the incisura parietalis beside the sutura lambdoidea on skull No. 9416 of a Senium male.

Os epiptericum could be seen in 2 cases. While it could be found only on the right-side of the adult female skull Inv. No. 9418, it could be found on both sides of the juvenile skull Inv. No. 9432.

Os bregmaticum occured on the adult female Inv. No. 9431.

Sutura incisiva can be seen on the maxilla of the Infans II age child Inv. No. 9406, however it is incomplete.

The mature woman of Inv. No. 9405 is bathrocephal but in a strange, assymmetric way, as the anomaly developed only on the left-side of the skull.

Torus palatinus sagittalis could be registered in 5 cases (4 females, 1 Juvenis), usually in a moderate form.

Adult male Inv. No. 9410 had divided condylus occipitalis.

Perforatio fossae olecrani humeri could be found in 2 cases (2 adult females) within the very limited quantity of postcranial material.

Exostosis can be seen on the right femur, on the right tibia and on the right radius of adult male Inv. No. 9421. Unfortunately the left-side long-bones have not been collected so we shall never know if they showed anomalies.

Arthritis deformans can be found on the right femur of adult female Inv. No. 9411 and on both femora of adult female Inv. No. 9412/a.

Considering the fact that there are no spondylic vertebrae or other postcranial bones present in this series the question must be posed, whether they did bear some anomalies but were not found worthy of attention at the time of the excavation or there were nd anomalies at all.

TAXONOMICAL ANALYSIS

4 male and 4 female skulls were suitable for the evaluation of primary taxonomical characteristics (Tables 9, 10, 11, 12).

Nasomalar angle (Martin 77): average values for both sexes are of Euorpoid character. 1 male (Inv. No. 9417) and 1 female (Inv. No. 9418) present data similar to the mean value of Europoid and Mongoloid group averages.

Zygomaxillar angle (ZM): individual and average values for both sexes are characteristic for Europoids.

Dacryal subtense (DS): male values are of Europoid character in all cases, while that of 1 female (Inv. No. 9405) is quite close to the typical value of Mongoloids. For this reason

the average of females approaches the mean value of Europoid and Mongoloid group averages.

Simotical subtense (SS): averages of both sexes reflect a Europoid character. 1 male (Inv. No. 9405) and 1 female (Inv. No. 9416) are of Europo-Mongoloid character, as far as this characteristic is concerned.

Dacryal index (ID): male average presents a Europoid value while that of females a Europo-Mongoloid value. The dacryal index of male skull Inv. No. 9407 is similar to that of Europo-Mongoloids and the dacryal index of female skulls Inv. No. 9405 is similar to that of Mongoloids.

Simotical index (IS) analysis brought results similar to dacryal index analysis. The male average is typical for Europoids, the female average is typical for Europo-Mongoloids. 1 male (Inv. No. 9416) has an IS value approaching that of Europo-Mongoloids. The IS value of female skull Inv. No. 9405 is close to that of Mongoloids.

Nasal spine angle (Martin 75_1) was possible to calculate for 1 male skull and the result was a Europoid value. We have data for 2 females. Skull Inv. No. 9405 displayed a Europo-Mongoloid value while skull Inv. No. 9415 a Mongoloid one. In the last case all other primary taxonomical characteristics were markedly Europoid.

I have also analysed the indices supplementing the primary taxonomical characteristics and fossa canina values (TÓTH 1962, 1964, 1967, 1968).

The averages of incisura maxillo-malare indices (IMMS: IMMC) are of Europoid character for both sexes. The male fossa canina is very varied. Deep and shallow measurements were all present (thus the average is medium). Females are characterized by a more homogeneus medium and deep fossa canina value group.

The facial flatness index (IC) value (-15.7) also supports the Europoid character of the series.

The series collected at Csepel is Europoid. 1 female (Inv. No. 9405) and 1 male (Inv. No. 9416) skull each presents some Mongoloid influence, these can be classified as Europo-Mongoloids. The female Inv. No. 9405 had several primary taxonomical characteristics with similar values to those of Mongoloids. This is why the averages of females frequently approach those of Europo-Mongoloids within this series with a very small number of cases, though all the other individuals are Europoid.

Secondary taxonomical characteristics were possible to analyse on 7 skulls. 5 skulls presented the characteristics of the Europid great race (2 males and 3 females). The features of the Nordic race are present mixed with some undetermined elements on male skull Inv. No. 9417 and on female skull Inv. No. 9418. Male skull Inv. No. 9410 and female skull Inv. No. 9430 bear Atlanto-Mediterranean characteristics. There is 1 undetermined Brachycran female (Inv. No. 9415). The primary taxonomical analysis results are supported by 2 Europo-Mongoloid-like skulls. These are male Inv. No. 9416 and female Inv. No. 9405. On the last one the features of the Pamyrian race can be recognized as Europid elements (Table 13).

COMPARATIVE ANALYSIS

The limited number of cases within the series and their accidental nature restricted the choice of comparative methods. I have drawn 10 other Avar-age cemetery series into the present study. They were taken from the 6th to the 9th Centuries.

TOPOGRAPHICAL REPRESENTATION OF ABSOLUTE MEASUREMENTS

I represented the mutual relations of three absolute measurements (Martin 8, 45, 48) and three indices (8:1, 52:51, 54:55) examining 10 comparative series in Figures 1-10.

The males present the most marked resemblance to the males of Előszállás-Bajcsihegy and Üllő I, though as far as the orbital cavity index - upper face height and orbital cavity index - nasal index correlations are concerned Előszállás-Bajcsihegy differs considerably. The greatest difference could be found between the male group of this series and those of Budapest-Népstadion and of Környe.

The females show the greatest similarity to those of the series of Budapest-környéke and to the females of Környe - quite contrary to the males. The greatest difference exists between the females of Csepel-Szabadkikötő and those of Áporkai-Ürbőpuszta and Budapest-Népstadion. A certain difference can be found regarding upper face height - orbital cavity index and orbital cavity index - nasal index relationships in this case too. The females of Áporkai-Ürbőpuszta are similar to the females of Csepel-Szabadkikötő while the females of Környe are different.

I remark that the female series of Csepel-Szabadkikötő is similar to the females of the series of Solymár. Unfortunately I could not draw this cemetery into the present comparison as I analysed it only at a later date.

COMPARISON OF FACIAL FLATNESS DATA

I utilized the averages of 8 comparative series (BOTTYÁN 1966, TÓTH 1970) beside the averages calculated for Europoids, Mongoloids, 7th-8th Century Avars (TÓTH 1958) and for Conquering Hungarians (TÓTH 1965) (Tables 14, 15, Figures 11-22).

No analysed series offered close resemblances to the males, but the male series of Előszállás-Bajcsihegy and Üllő I were the most similar, as in the topographical representation too. The males of Váchartyán are the most dissimilar.

The female series of Csákberény and Környe are the most similar. In some aspects they are fairly close to the averages calculated for the Avars. The female series of Vác-Kavicsbánya is also similar, though to a lesser extent. The females of Budapest-környéke and of Üllő I are the least similar. They considerably differ in a good number of aspects from the averages calculated for Europoids as well as from those of the Conquering Hungarians.

The results of the two methods are partly the same and partly contrasting. The closest series of males are the same: Előszállás-Bajcsihegy, Üllő I. It is only partly true for the females. Környe proved to be similar by both methods. The females of Budapest-környéke are similar according to the topographical representation but they are different according to the analysis of facial flatness data.

SUMMARY

Because of the reasons mentioned in the introduction of the study it would be a mistake to try to establish ancestry or kinship relations. However, a question emerges. The females of certain series (Solymár, Budapest-környéke, Vác-Kavicsbánya), from the geographical proximity of our series, are anthropologically similar. The males of the same group of series are markedly dissimilar at the same time. It is possible that these females represented to some extent the autochthonous population found here. On the other hand, they also bore the anthropological characteristics integrated by the way of marriages at previous locations and in earlier times. The fact that they approach the Avars' average values in some comparisons points to this.

The males are similar to the male population of some geographically more distant cemeteries, but this is not sufficient evidence to take their mutual kinship for granted.

REFERENCES

ALEXEYEV, V.P. & DEBETS, G.F. (1964): Kraniometriya. Metodika antropologicheskikh isledovanii. - 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 cimetière 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.

FERENCZ, M. (1980-1981): Some data to the palaeoanthropology of the Avar Period's population in Hungary. - Anthrop. hung., 17: 23-64.
FERENCZ, M. (1982-1983): The Avar-age cemetery at Solymár. - Anthrop. hung., 18: 9-41.
FARKAS, Gy. (1972): Antropológiai praktikum I.[Anthropological practice I]. - Szeged: 28-66. (Manuscript, in Hungarian).
LIPTÁK, P. (1951): Étude anthropologique du cimetière avare d'Áporkai Ürbőpuszta. - Annls hist.-nat. Mus. natn. hung., 1: 232-259.
LIPTÁK, P. (1954): A típusok 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. (1963): Budapest avarkori népességének antropológiája I (Anthropologie der awarenzeitlichen Bevölkerung von Budapest I). - Budapest Régiségei, 20: 327-334.
LIPTÁK, P. (1965): On the Taxonomic Method in Palaeanthropology (Historical Anthropology) Acta biol. 11: 169-183.
LIPTÁK, P. (1969): Embertan és emberszármazástan [Anthropology and geneology]. - Tankönyvkiadó, Budapest, 284 pp. (in Hungarian).
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. 1. - Stuttgart: 440-597.
MOLLISON, Th. (1938): Spezielle Methoden Anthropologischen Messungen (in: ABDERHALDEN, E: Handbuch der biologischen Arbeitsmethoden. VII. 2-3). - Berlin: 523-628.
TOTH, T. (1958): Profilation horizontale du crâne facial de la population ancienne et contemporaine de la Hongrie. - Crania hung., 3: 3-126.
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. (1965): A honfoglaló magyarság ethnogenezisének problémája (Problèmes de l'ethnogenese 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 udelnom vese mongoloidnyh elementov v naselenii Avarskogo Kaganata (in: TÓTH, T. & FIRSHTEIN, B.V.: Antropologicheskie dannye k voprosy o velikom preselenii narodov Avaryi Sarmaty). - 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.
WENGER, S. (1966): Anthropologie de la population d'Előszállás-Bajcsihegy provenant des temps avars. - Anthrop. hung., 7: 115-206.
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	Total %
Cranium and postcranium	Infans I	-	-	-	-	-
	Infans II	-	-	1	1	3.2
	Juvenis	-	-	-	-	-
	Adultus	5	6	-	11	35.5
	Maturus	-	3	-	3	9.7
	Senium	1	-	-	1	3.2
	Total:	6	9	1	16	51.6
Cranium only	Infans I	-	-	1	1	3.2
	Infans II	-	-	-	-	-
	Juvenis	-	-	3	3	9.7
	Adultus	1	3	-	4	12.9
	Maturus	3	-	-	3	9.7
	Senium	-	-	-	-	-
	Total:	4	3	4	11	35.5
Postcranial skeleton	Infans I	-	-	-	-	-
	Infans II	-	-	-	-	-
	Juvenis	-	-	-	-	-
	Adultus	-	-	-	-	-
	Maturus	3	1	-	4	12.9
	Senium	-	-	-	-	-
	Total:	3	1	-	4	12.9
Total		13 (41.9 %)	13 (41.9 %)	5 (16.2 %	31	

Table 2 Distribution of crania

Age groups	Measurable		Unmeasurable			Total	
	Male	Female	Male	Female	Undet.	N	%
Infans I	-	-	-	-	1	1	3.7
Infans II	-	-	-	-	1	1	3.7
Juvenis	-	-	-	-	3	3	11.1
Adultus	4	6	2	3	-	15	55.6
Maturus	3	2	-	1	-	6	22.2
Senium	1	-	-	-	-	1	3.7
Total	8 (29.6%)	8 (29.6%)	2 (7.4%)	4 (14.9%)	5 (18.5%)	27	

Table 3 Parameters of male series

Martin No.	N	V	M	s
1	3	172-190	183.00	10.15
1c	3	170-187	180.40	9.32
5	3	96-103	99.00	3.16
8	4	136-152	145.00	7.07
9	4	93-103	97.00	4.24
10	3	114-125	119.33	5.51
17	3	125-137	132.00	6.25
20	3	112-116	113.67	2.13
32	2	80- 81	80.50	0.87
32-	2	73- 75	74.00	1.41
40	2	94-101	97.50	4.97
43	3	104-106	104.67	1.25
45	2	127-134	130.50	4.97
46	3	87- 91	89.33	2.10
47	-	-	-	-
48	2	70- 77	73.50	4.97
51	4	40- 43	41.75	1.33
52	4	32- 35	33.25	1.51
54	3	24- 27	26.00	1.73
55	3	57- 59	57.67	1.25
62	2	47- 50	48.50	2.18
63	2	42- 43	42.50	0.87
65	1	115.00	115.00	-
66	2	96- 97	96.50	0.87
69	3	22- 38	29.67	8.03
70	4	60- 73	66.25	5.85
71a	4	28- 39	32.75	4.59
72	1	85.00	85.00	-
73	1	80.00	80.00	-
74	1	92.00	92.00	-
75	1	53.00	53.00	-
75/1	1	32.00	32.00	-
8/1	3	75.3- 79.1	78.17	4.07
17/1	3	66.1- 77.9	72.00	12.00
17/8	3	83.9- 98.5	93.17	15.51
9/8	4	64.4- 68.4	67.00	3.56
47/45	-	-	-	-
48/45	1	55.1	55.12	-
52/51	4	76.2- 85.0	79.75	8.85
54/55	3	42.1- 47.4	45.33	5.69
63/62	2	84.0- 91.5	87.75	10.62
Stature acc. to MANOUVRIER	4	154.1-171.6	163.25	15.72
Stature acc. to BREITINGER	4	161.1-176.0	168.75	13.10

Table 4 Parameters of female series

Martin No.	N	V	M	s
1	3	173-175	173.67	1.25
1c	3	174-175	174.33	0.62
5	4	90-105	97.00	6.48
8	5	126-143	134.80	6.15
9	5	89- 99	92.00	4.00
10	4	108-126	116.25	8.26
17	4	125-137	130.25	4.99
20	4	101-114	110.00	6.16
32	4	75- 92	81.75	8.31
32	4	71- 87	78.00	8.25
40	3	89-101	95.67	6.12
43	5	95-103	98.40	3.44
45	1	122.00	122.00	-
46	4	88- 91	89.50	1.32
47	1	114.00	114.00	-
48	4	65- 68	66.75	1.56
51	5	38- 42	39.80	1.83
52	5	32- 37	33.80	1.96
54	5	23- 26	24.40	1.16
55	5	41- 54	47.40	4.83
62	4	36- 50	43.50	5.98
63	3	35- 38	37.00	1.73
65	3	105-121	112.67	6.97
66	4	88- 95	92.25	2.99
69	6	20- 28	23.33	3.56
70	4	53- 58	56.25	2.22
71a	5	25- 33	29.20	3.03
72	4	79- 89	83.50	4.80
73	4	77- 87	82.25	4.58
74	4	74- 95	85.00	8.60
75	2	59- 60	59.50	0.87
75/1	2	20- 27	23.50	4.97
8:1	3	72.0- 82.6	76.17	10.70
17:1	3	74.6- 78.3	76.00	4.36
17:8	4	91.0-108.7	97.00	15.89
9:8	5	64.9- 72.2	68.40	5.18
47:45	-	-	-	-
48:45	1	53.3	53.28	-
52:51	5	80.5- 89.5	85.30	7.54
54:55	5	48.2- 61.0	52.10	10.53
63:62	2	82.6-105.6	94.09	32.53
Stature acc. to MANOUVRIER	1	154.9	154.92	-
Stature acc. to BACH	1	160.5	160.54	-

Table 5 Distribution of morphological characteristics

Characteristics		Male		Female		Total	
		N	%	N	%	N	%
Norma verticalis	Pentagonoid	-	-	1	16.7	1	7.7
	Sphenoid	6	85.7	2	33.3	8	61.5
	Birsoid	1	14.3	3	50.0	4	30.8
	Total:	7		6		13	
Glabella	Broca 1	-	-	1	14.3	1	7.1
	Broca 2	-	-	5	71.4	5	35.7
	Broca 3	-	-	1	14.3	1	7.1
	Broca 4	3	42.9	-	-	3	21.4
	Broca 5	4	57.1	-	-	4	28.6
	Total:	7		7		14	
Arcus superciliaris	Broca 1	-	-	6	85.7	6	40.0
	Broca 2	1	12.5	1	14.3	2	13.3
	Broca 3	7	87.5	-	-	7	46.7
	Total:	8		7		15	
Protuberantia occipitalis externa	Broca 1	-	-	1	50.0	1	12.5
	Broca 2	2	33.3	-	-	2	25.0
	Broca 3	2	33.3	-	-	2	25.0
	Broca 4	2	33.3	1	50.0	3	37.5
	Total:	6		2		8	
Processus mastoideus	Harsányi -2	-	-	3	42.8	3	21.4
	Harsányi -1	-	-	3	42.8	3	21.4
	Harsányi 0	2	28.6	1	14.3	3	21.4
	Harsányi +1	3	42.8	-	-	3	21.4
	Harsányi +2	2	28.6	-	-	2	14.3
	Total:	7		7		14	
Nasal aperture	Sulc. praenas.	1	33.3	3	75.0	4	57.1
	Fossa praenas.	2	66.7	1	25.0	3	42.9
	Total:	3		4		7	
Spina nasalis anterior	Broca 3	-	-	1	100.0	1	25.0
	Broca 4	3	100.0	-	-	3	75.0
	Total:	3		1		4	

Table 5 (continued)

Characteristics		Male		Female		Total	
		N	%	N	%	N	%
Fossa canina	Very small (1)	1	25.0	1	16.7	2	20.0
	Small (2)	1	25.0	2	33.3	3	30.0
	Medium (3)	-	-	2	33.3	2	20.0
	Large (4)	2	50.0	1	16.7	3	30.0
	Total:	4		6		10	
Alveolar prognatism	Vertical (1)	-	-	1	100.0	1	25.0
	Moderate (2)	2	100.0	-	-	2	75.0
	Total:	2		1		3	
Teeth wear	Körber 1	-	-	1	11.1	1	6.3
	Körber 2	-	-	2	22.2	2	12.5
	Körber 3	4	57.1	3	33.3	7	43.7
	Körber 4	2	28.6	3	33.3	5	31.2
	Körber 5	1	14.3	-	-	1	6.3
	Total:	7		9		16	

Table 6 Parameters of the stature

No.	Sex	Age	MANOUVRIER	BREITINGER-BACH
9405	Female	Mat	154.9	160.5
9409	Male	Ad	158.9	165.5
9414	Male	Ad	154.2	161.1
9419	Male	Mat	171.6	178.0
9421	Male	Ad	167.0	171.2

Table 7 Parameters of the cranium - Males

Martin No.	9407 Mat	9409 Ad	9410 Ad	9416 Sen	9417 Mat	9421 Ad	9425 Mat	9429 Ad
1	-	-	189	172	190	-	-	-
1c	-	-	185	170	187	-	-	-
5	-	-	103	96	98	-	-	-
8	-	-	149	136	143	-	-	152
9	-	-	96	93	96	-	-	103
10	-	-	125	119	114	-	-	-
17	-	-	125	134	137	-	-	-
20	-	-	112	116	113	-	-	-
32	-	-	-	81	80	-	-	-
32-	-	-	-	75	73	-	-	-
40	-	-	101	-	94	-	-	-
43	-	-	106	104	104	-	-	-
45	-	-	-	134	127	-	-	-
46	-	-	87	90	91	-	-	-
47	-	-	-	-	-	-	-	-
48	-	-	77	-	70	-	-	-
50	26	-	21	20	19	-	-	-
51	42	-	43	40	42	-	-	-
51a	-	-	41	38	40	-	-	-
52	32	-	35	34	32	-	-	-
54	-	-	27	27	24	-	-	-
55	-	-	59	57	57	-	-	-
62	-	-	50	-	47	-	-	-
63	-	-	42	-	43	-	-	-
65	-	-	-	-	-	-	115	-
66	-	97	-	96	-	-	-	-
69	-	29	-	-	-	22	38	-
70	-	63	-	60	-	73	69	-
71a	-	28	-	39	-	32	32	-
72	-	-	-	-	85	-	-	-
73	-	-	-	-	80	-	-	-
74	-	-	-	-	92	-	-	-
75	-	-	-	-	53	-	-	-
75/1	-	-	-	-	32	-	-	-
8:1	-	-	78.8	79.1	75.3	-	-	-
17:1	-	-	66.1	77.9	72.1	-	-	-
17:8	-	-	83.9	98.5	95.8	-	-	-
9:8	-	-	64.4	68.4	67.1	-	-	67.8
47:45	-	-	-	-	-	-	-	-
48:45	-	-	-	-	55.1	-	-	-
52:51	76.2	-	81.4	85.0	76.2	-	-	-
54:55	-	-	45.8	47.4	42.1	-	-	-
63:62	-	-	84.0	-	91.5	-	-	-

Table 8 Parameters of the cranium - Females

Martin No.	9405 Mat	9415 Ad	9418 Ad	9426 Mat	9430 Ad	9433 Ad	9412/A Ad	9412/B Ad
1	173	-	-	-	175	173	-	-
1c	175	-	-	-	174	174	-	-
5	94	99	-	-	105	90	-	-
8	143	134	134	-	126	137	-	-
9	99	90	91	-	91	89	-	-
10	126	111	120	-	108	-	-	-
17	130	125	-	-	137	129	-	-
20	114	101	114	-	111	-	-	-
32	92	75	85	-	75	-	-	-
32-	87	71	83	-	71	-	-	-
40	89	97	-	-	101	-	-	-
43	103	97	96	-	101	95	-	-
45	122	-	-	-	-	-	-	-
46	89	91	90	-	88	-	-	-
47	-	-	114	-	-	-	-	-
48	65	68	66	-	68	-	-	-
50	23	17	18	-	22	17	-	-
51	41	40	38	-	42	38	-	-
51a	38	38	37	-	39	37	-	-
52	33	33	34	-	37	32	-	-
54	25	24	24	-	26	23	-	-
55	41	48	49	-	54	45	-	-
62	42	46	36	-	50	-	-	-
63	35	38	38	-	-	-	-	-
65	112	-	-	105	-	-	121	-
66	-	-	95	88	-	-	93	93
69	27	24	20	28	-	-	20	21
70	-	-	53	58	-	-	57	57
71a	-	33	31	28	-	-	29	25
72	86	80	89	-	79	-	-	-
73	85	77	87	-	80	-	-	-
74	85	86	95	-	74	-	-	-
75	59	60	-	-	-	-	-	-
75/1	27	20	-	-	-	-	-	-
8:1	82.7	-	-	-	72.0	79.2	-	-
17:1	75.1	-	-	-	78.3	74.6	-	-
17:8	90.9	93.3	-	-	108.7	94.2	-	-
9:8	69.2	67.2	67.9	-	72.2	65.0	-	-
47:45	-	-	-	-	-	-	-	-
48:45	53.3	-	-	-	-	-	-	-
52:51	80.5	82.5	89.5	-	88.1	84.2	-	-
54:55	61.0	50.0	49.0	-	48.2	51.1	-	-
63:62	83.3	82.6	105.6	-	-	-	-	-

Table 9 Individual data of the facial flatness - Males

Characteristics	9407 Mat	9410 Ad	9416 Sen	9417 Mat
1. Bi-malar chord (43_1)	99.8	97.9	93.9	98.0
2. Bi-malar subtense	19.9	22.7	18.0	16.2
3. Zygomaxillar chord	-	87.3	-	91.5
4. Zygomaxillar subtense	-	29.2	-	27.0
5. Dacryal chord (DC)	27.0	20.5	21.4	19.0
6. Dacryal subtense (DS)	12.1	11.6	12.1	12.4
7. Simotical chord (SC)	8.9	10.8	8.2	6.9
8. Simotical subtense (SS)	4.4	5.6	3.2	4.5
9. Malar chord (C)	55.2	54.8	60.8	59.6
10. Malar subtense (S)	11.4	9.8	14.0	17.3
11. Incisure maxillo-malar chord (IMMC)	27.1	-	-	24.0
12. Incisure maxillo-malar subtense (IMMS)	5.0	-	-	6.0
13. Dacryal index (ID)	44.8	56.6	56.5	65.3
14. Simotical index (IS)	49.4	51.9	39.0	65.2
15. Malar arc index (S:C)	20.7	17.9	23.9	29.0
16. IMM index (IMMS:IMMC)	18.5	-	-	25.0
17. Nasomalar angle	136.6	130.2	138.0	143.5
18. Zygomaxillar angle	-	112.4	-	118.9
19. Fossa canina	6.1	-	3.0	2.8

Table 10 Individual data of the facial flatness - Females

Characteristics	9405 Mat	9415 Ad	9418 Ad	9430 Ad
1. Bi-malar chord (43_1)	96.3	89.6	89.0	96.9
2. Bi-malar subtense	17.1	16.3	14.7	20.0
3. Zygomaxillar chord	88.1	91.1	88.1	87.9
4. Zygomaxillar subtense	23.4	26.8	22.4	28.7
5. Dacryal chord (DC)	22.2	18.5	-	22.9
6. Dacryal subtense (DS)	8.6	11.2	-	12.3
7. Simotical chord (SC)	9.6	7.9	-	11.1
8. Simotical subtense (SS)	3.3	4.6	-	4.8
9. Malar chord (C)	48.2	57.1	44.6	-
10. Malar subtense (S)	8.0	12.4	8.0	-
11. Incisure maxillo-malar chord (IMMC)	23.9	24.3	25.2	-
12. Incisure maxillo-malar subtense (IMMS)	5.5	5.9	6.6	-
13. Dacryal index (ID)	38.7	60.5	-	53.7
14. Simotical index (IS)	34.4	58.2	-	43.2
15. Malar arc index (S:C)	16.6	21.7	17.9	-
16. IMM index (IMMS:IMMC)	23.0	24.3	26.2	-
17. Nasomalar angle	140.8	140.0	143.5	135.2
18. Zygomaxillar angle	124.0	119.1	126.1	113.6
19. Fossa canina	5.8	5.6	4.9	-

Table 11 Parameters of the facial flatness - Males

Characteristics	N	V	M	s
1. Bi-malar chord (43_1)	4	93.9- 99.8	97.50	2.53
2. Bi-malar subtense	4	16.2- 22.7	19.25	2.99
3. Zygomaxillar chord	2	87.3- 91.5	89.50	3.57
4. Zygomaxillar subtense	2	27.0- 29.2	28.00	1.41
5. Dacryal chord (DC)	4	19.0- 27.0	22.00	3.46
6. Dacryal subtense (DS)	4	11.6- 12.4	12.05	0.82
7. Simotical chord (SC)	4	6.9- 10.8	8.75	1.76
8. Simotical subtense (SS)	4	3.2- 5.6	4.50	1.32
9. Malar chord (C)	4	54.8- 60.8	57.75	3.23
10. Malar subtense (S)	4	9.8- 17.3	13.00	3.16
11. Incisure maxillo-malar chord (IMMC)	2	24.0- 27.1	25.50	2.18
12. Incisure maxillo-malar subtense (IMMS)	2	5.0- 6.0	5.50	0.87
13. Dacryal index (ID)	4	44.8- 65.3	56.00	8.25
14. Simotical index (IS)	4	39.0- 65.2	51.25	10.72
15. Malar arc index (S:C)	4	17.9- 29.0	22.75	4.67
16. IMM index (IMMS:IMMC)	2	18.5- 25.0	22.00	4.24
17. Nasomalar angle	4	130.2-143.5	137.25	5.74
18. Zygomaxillar angle	2	112.4-118.9	115.50	4.97
19. Fossa canina	3	2.8- 6.1	4.00	1.58

Table 12 Parameters of the facial flatness - Females

Characteristics	N	V	M	s
1. Bi-malar chord (43_1)	4	89.0- 96.9	93.00	4.08
2. Bi-malar subtense	4	14.7- 20.0	17.00	2.16
3. Zygomaxillar chord	4	87.9- 91.1	88.75	1.56
4. Zygomaxillar subtense	4	22.4- 28.7	25.25	3.31
5. Dacryal chord (DC)	3	18.5- 22.9	21.33	2.10
6. Dacryal subtense (DS)	3	8.6- 12.3	10.67	1.60
7. Simotical chord (SC)	3	7.9- 11.1	9.67	1.60
8. Simotical subtense (SS)	3	3.3- 4.8	4.33	1.18
9. Malar chord (C)	3	44.6- 57.1	50.00	6.24
10. Malar subtense (S)	3	8.0- 12.4	9.33	2.32
11. Incisure maxillo-malar chord (IMMC)	3	23.9- 25.2	24.50	1.00
12. Incisure maxillo-malar subtense (IMMS)	3	5.5- 6.6	6.00	1.00
13. Dacryal index (ID)	3	38.7- 60.5	51.33	11.24
14. Simotical index (IS)	3	34.4- 58.2	45.00	12.12
15. Malar arc index (S:C)	3	16.6- 21.7	19.00	2.65
16. IMM index (IMMS:IMMC)	3	23.0- 26.2	24.33	1.55
17. Nasomalar angle	4	135.2-143.5	140.00	3.74
18. Zygomaxillar angle	4	113.6-126.1	120.75	5.40
19. Fossa canina	3	4.9- 5.8	5.50	1.00

Table 13 Taxonomical analysis

Types		Male	Female	Total
Nordoids	n-x	1	1	2
Mediterraneans	am	1	1	2
Brachycranials	br-x	-	1	1
Europo-mongoloids		1	1	2
Total		3	4	7

Sequence of series of Figures 1-10 is as follows:

1. Áporkai-Ürbőpuszta
2. Budapest környéke, 6-8th c.
3. Budapest-Népstadion, 6-9th c.
4. Csákberény, 6-7th c.
5. Előszállás-Bajcsihegy, 6-7th c.
6. Környe, 6-7th c.
7. Üllő I, 8th c.
8. Üllő II, 8th c.
9. Vác-Kavicsbánya, 7-8th c.
10. Váchartyán, 7-8th c.
11. Csepel-Szabadkikötő, 7-8th c.

Sequence of series of Figures 11-22 is the same as in Table 14.

Figs 1-5 Comparison of some male series
Figs 6-10 Comparison of some female series
Figs 11-16 Comparison of some male series
Figs 17-22 Comparison of some female series

Table 14 Comparison of some male series

Series	NM	ZM	DC	DS	SC	SS	75_I
1. [x]Budapest	139.9	126.4	20.2	11.5	8.0	4.2	28.5
2. [+]Csákberény	137.5	124.0	20.5	12.8	8.9	4.9	33.5
3. [+]Előszállás-Bajcsihegy	140.8	126.3	22.2	11.8	9.1	4.8	29.6
4. [+]Környe	136.7	123.0	20.6	13.2	9.4	5.1	28.0
5. [+]Üllő I	138.4	122.5	22.0	12.7	8.7	4.6	28.5
6. [+]Üllő II	138.3	126.2	22.4	12.7	9.9	5.1	30.0
7. Vác-Kavicsbánya	136.7	122.1	21.5	12.7	9.7	5.1	26.5
8. [+]Váchartyán	145.3	125.8	21.1	11.1	7.4	3.6	25.8
9. Csepel-Szabadkikötő	137.3	115.5	22.0	12.1	8.8	4.5	-
10. Avars (7-8th c.) (TÓTH 1958)	138.3	124.8	21.5	12.5	9.4	4.9	29.0
11. Europoids (TÓTH 1958)	137.0	125.4	-	13.0	-	5.0	33.0
12. Mongoloids (TÓTH 1958)	148.6	141.6	-	8.3	-	2.2	17.6
13. Conquering Hungarians (TÓTH 1965)	139.1	128.2	20.8	12.7	8.8	4.9	29.1

[+]TÓTH 1970

[x]BOTTYÁN 1966

Table 15 Comparison of some female series

Series	NM	ZM	DC	DS	SC	SS	75_I
1. [x]Budapest	144.8	131.4	20.5	8.6	8.8	2.9	17.5
2. [+]Csákberény	140.4	124.0	19.8	10.6	8.5	4.0	26.5
3. [+]Előszállás-Bajcsihegy	136.4	123.0	20.4	11.5	9.6	4.5	30.8
4. [+]Környe	137.0	122.7	18.6	11.2	7.9	4.2	22.6
5. [+]Üllő I	141.4	127.9	20.5	10.2	8.6	3.9	21.5
6. [+]Üllő II	139.1	125.3	20.9	11.4	9.2	4.3	27.1
7. Vác-Kavicsbánya	138.3	122.5	20.3	11.6	9.6	4.6	27.5
8. [+]Váchartyán	140.5	125.4	20.1	10.2	9.0	4.4	28.5
9. Csepel-Szabadkikötő	140.0	120.8	21.3	10.7	9.7	4.3	23.5
10. Avars (7-8th c.) (TÓTH 1958)	140.0	125.8	20.7	10.7	9.0	4.2	25.6
11. Europoids (TÓTH 1958)	137.0	125.4	-	13.0	-	5.0	33.0
12. Mongoloids (TÓTH 1958)	148.6	141.6	-	8.3	-	2.2	17.6
13. Conquering Hungarians (TÓTH 1965)	140.9	131.2	20.1	11.3	9.2	4.1	25.9

[+]TÓTH 1970

[x]BOTTYÁN 1966

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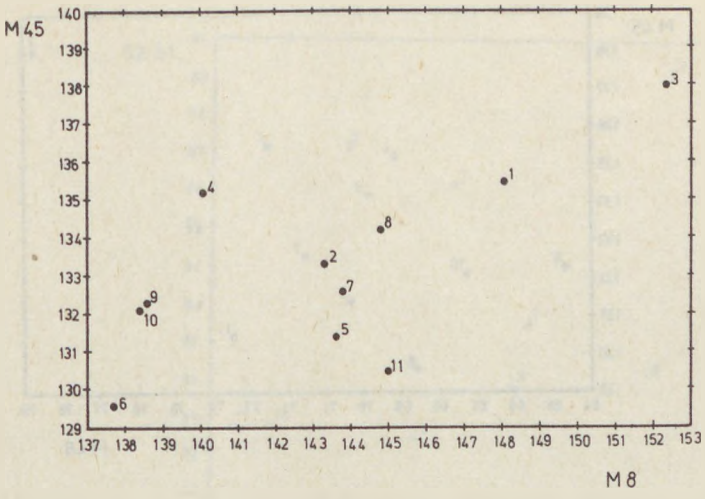
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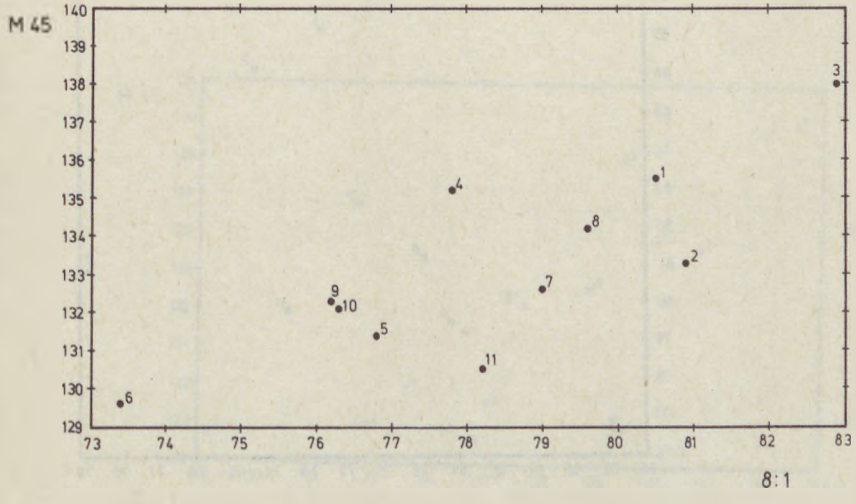
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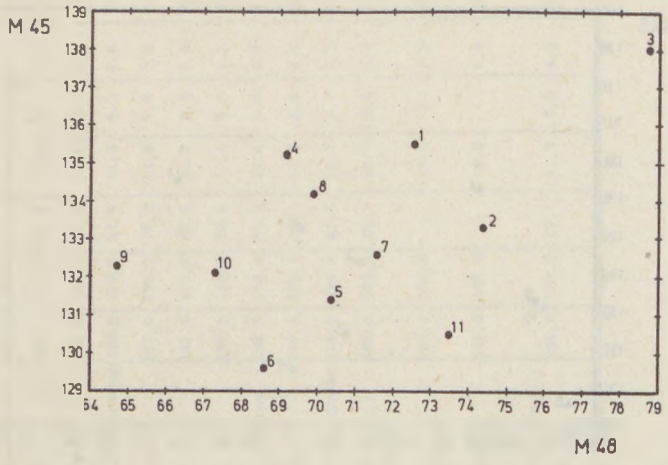
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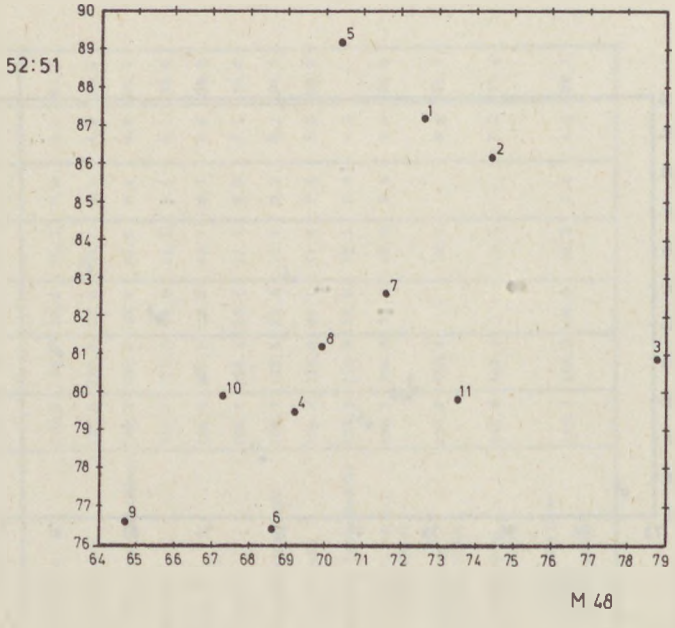
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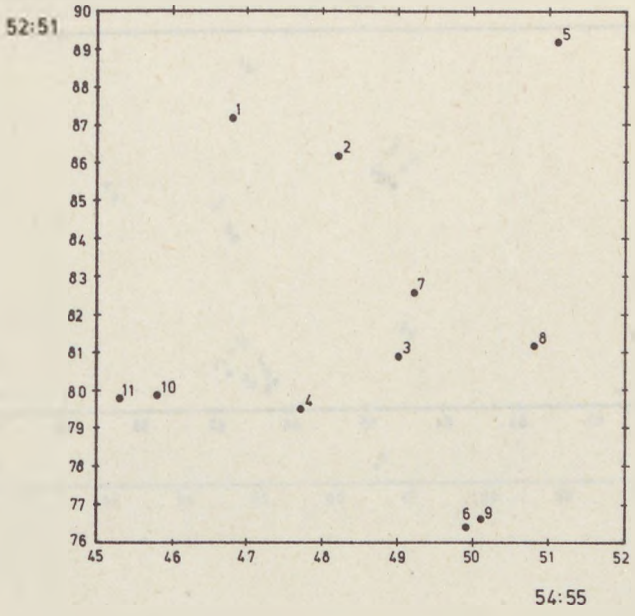
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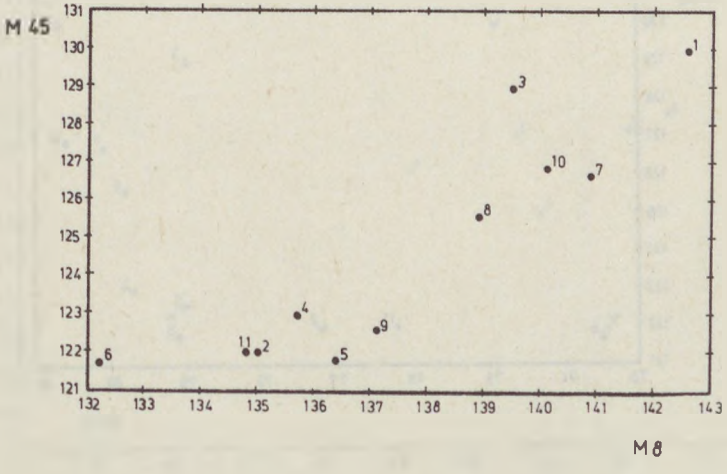
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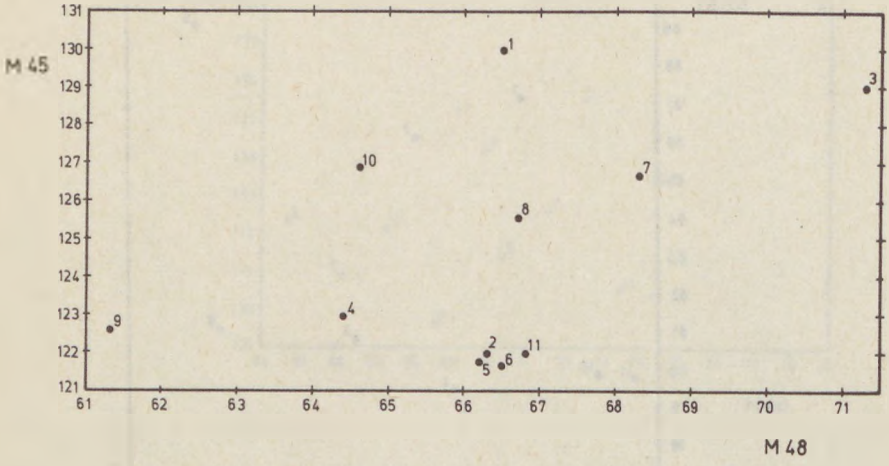
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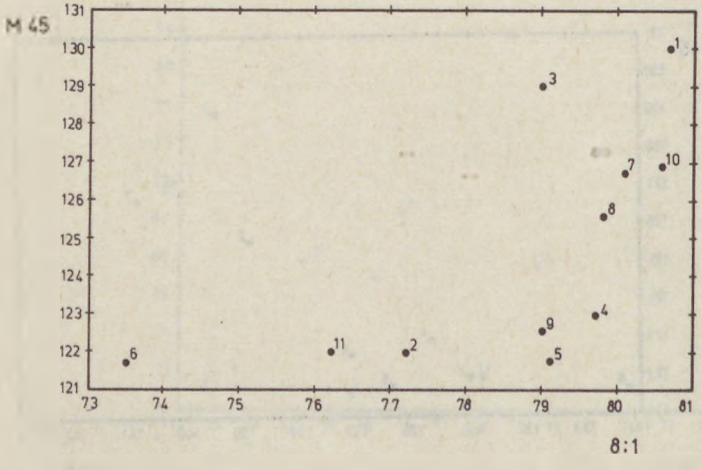
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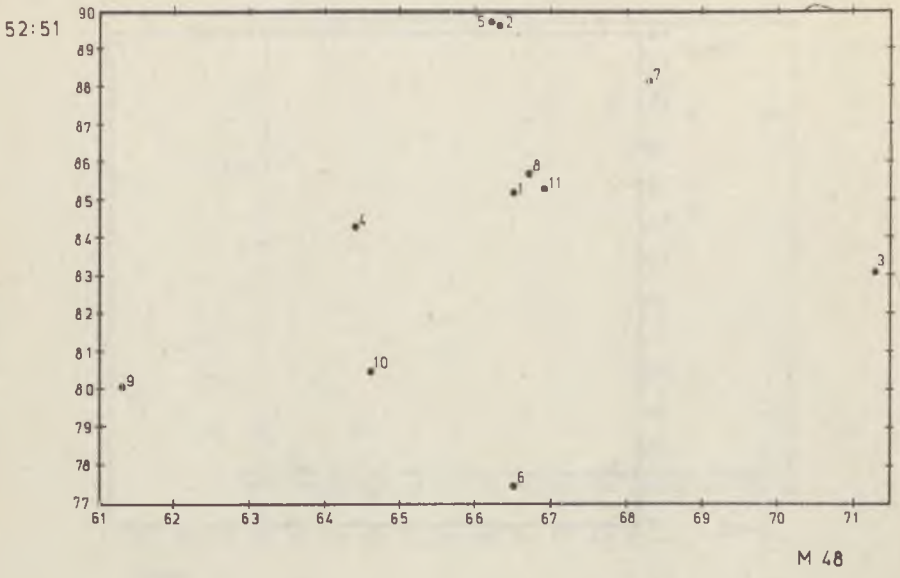
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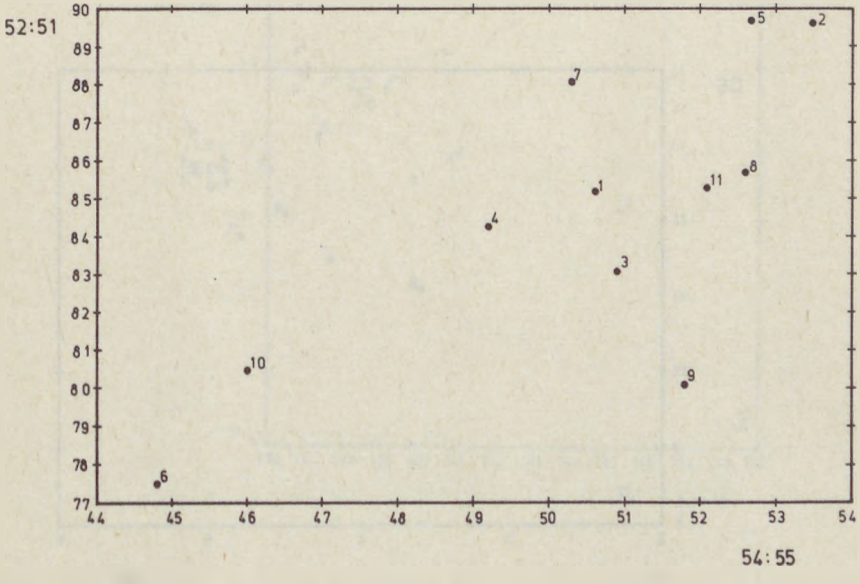
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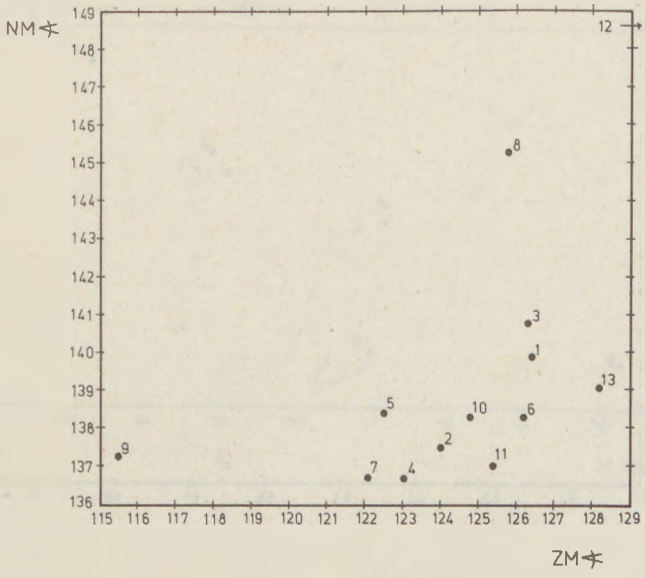
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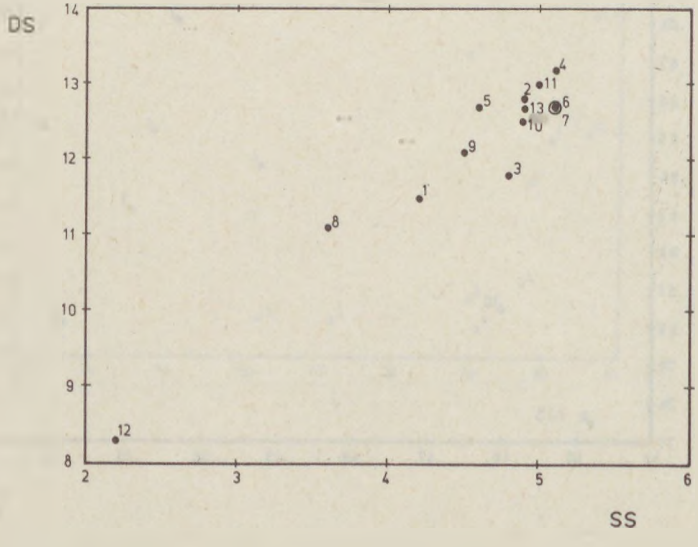
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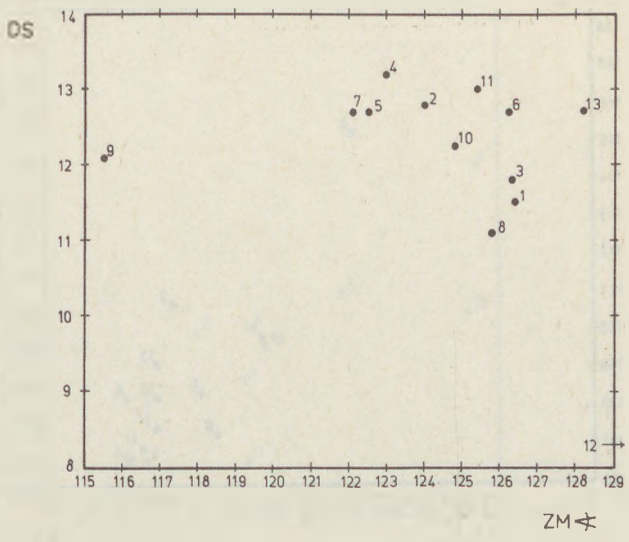
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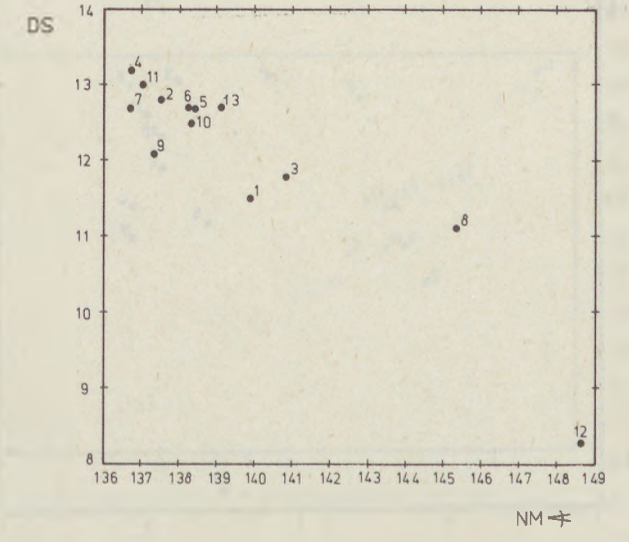
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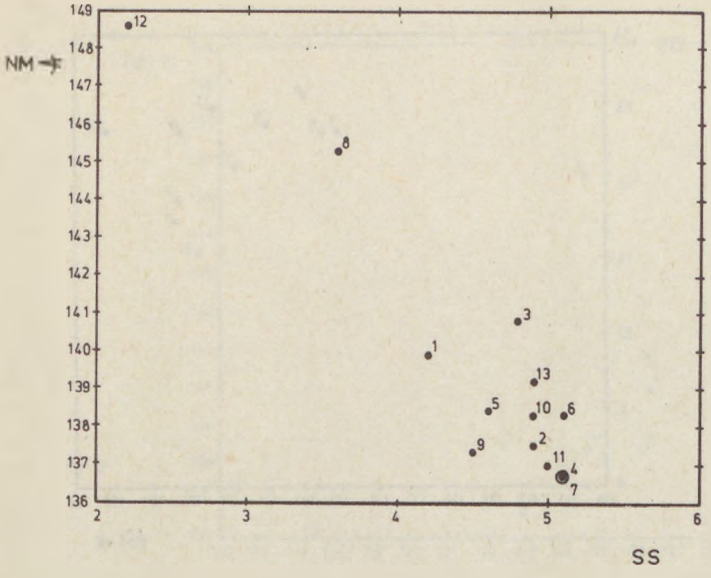
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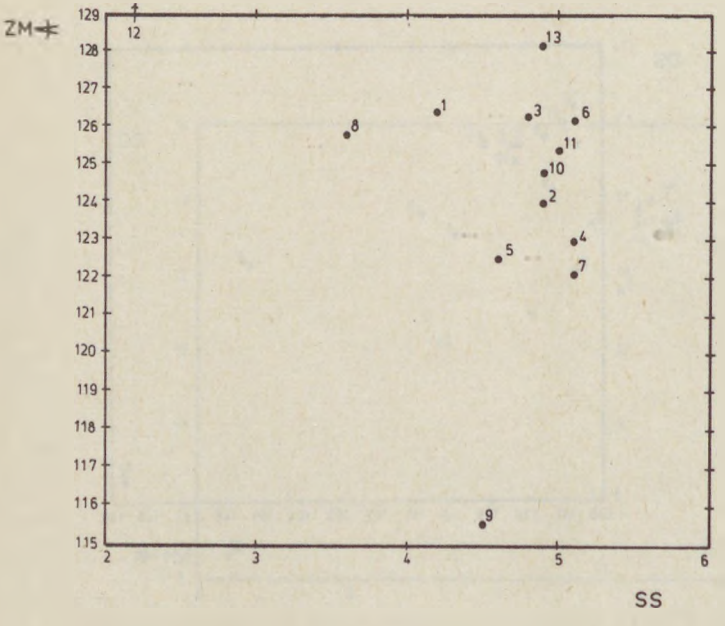
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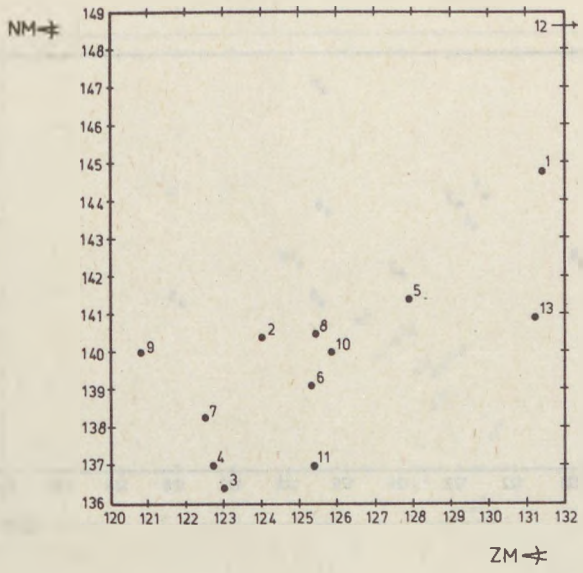
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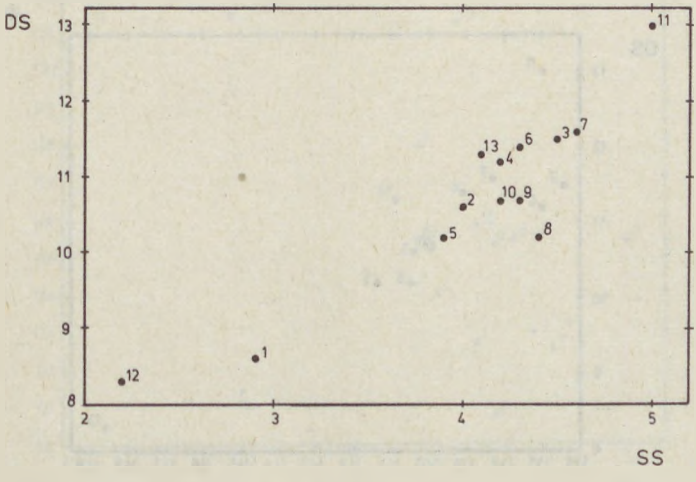
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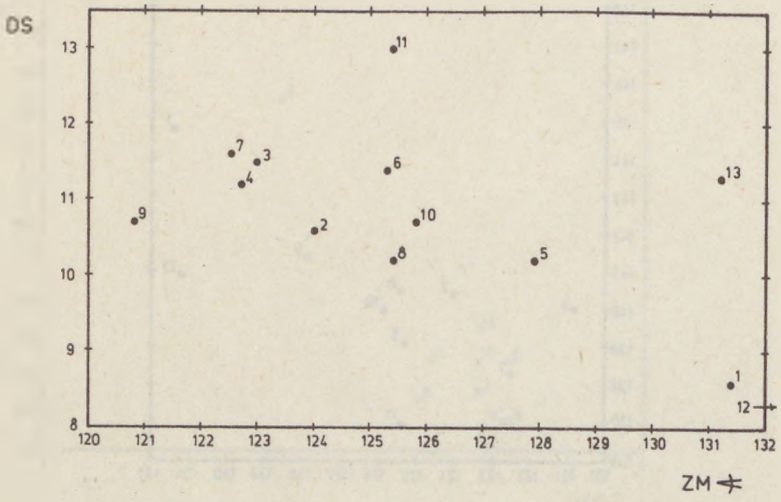
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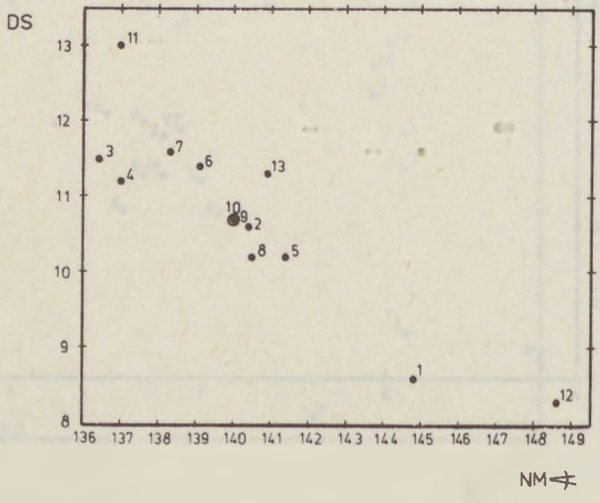
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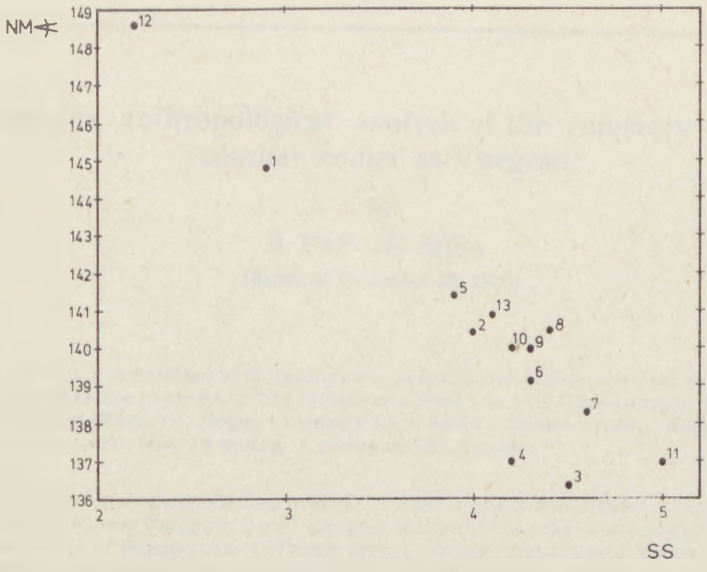
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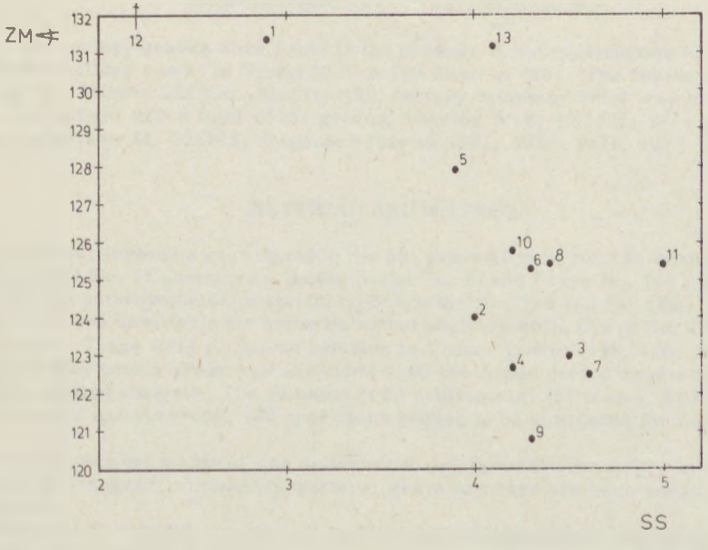
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ANTHROPOLOGIA HUNGARICA

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Complex anthropological analysis of the cemetery of the comitat center at Visegrád

By

I. PAP—É. SUSA

(Received December 20, 1985)

Abstract. A detailed anthropological, pathological and serological examination and comparative analysis of 208 individuals from the 11th-12th century cemetery of Visegrád (Várkert, Magyar Nemzeti Bank üdülő - Castle garden, National Bank holiday resort). With 19 tables, 6 plates and 21 figures.

The examination of cemeteries brought to light in the North-Eastern Transdanubian region of Hungary (Great Danubian Bend) can play a significant role in the analysis of the ethnogenetic processes of Hungarians. Only one series - Esztergom-Vasutállomás (Railway station), a former minters' village - was published from anthropological aspect of this area. Hopefully the examination of the population buried in the church-yard of Visegrád will supply some further starting points for the biological reconstruction of the population which lived in this region.

CIRCUMSTANCES OF THE EXCAVATION

11th-12th century graves were found in the process of the construction of the Hungarian National Bank's holiday resort in Visegrád (Comitat Pest) in 1966. The rescue excavation was directed by Mátyás SZŐKE. An 11th-12th century cemetery which was located around a church came to light with a total of 221 graves, bearing W-E, in 1972, 1974 and 1976-1979 (Excavation reports by M. SZŐKE, Régészeti füzetek 1971, 1973, 1975, 1977-1979).

MATERIAL AND METHOD

223 individual skeletons were found in the 221 graves. Grave No. 151 turned out to be a Roman one. Grave No. 71 contained a double burial (a, b) and Grave No. 144 a triple one (a, b, c). We have no anthropological material from Graves No. 1-6 and 64, 133. The contents of Grave No. 11 were unsuitable for anthropological analysis while Grave No. 128 contained a mixture of bones. There were no human remains in 5 other graves (158, 165, 180, 190, 196). Altogether 208 very poorly preserved skeletons from the Arpad period were available for a more or less detailed analysis. The remains of 80 individuals' (57 males, 23 females) were suitable for metric examinations. 128 specimens proved to be unsuitable for measurements (Table 1).

The anthropological material was delivered to and taken into inventory in the King Mathias Museum of Visegrád; to simplify matters, grave numbers are here used instead of inventory numbers.

É. SUSA and T. VARGA carried out age and sex determinations and the evaluation of morphological characteristics, anatomical variations and pathological changes. É. SUSA took

the measurements and did the taxonomical analysis; blood groups were determined by L. Zs. SANTORA and H. Zs. VÁCZI*. Some preliminary results have already been published (VARGA SUSA&SANTORA 1982). Facial flatness data were later added to complete the anthropological analysis (I. PAP).

Table 1 Distribution of sex, age and preservation

Age	Measurable		Non-measurable			Total
	Males	Females	Males	Females	Undet sex.	N
Infans I	-	-	-	-	45	45
Infans II	-	-	-	-	20	20
Juvenis	-	-	8	12	5	25
Adultus	12	4	4	6	2	28
Maturus	43	18	13	5	-	79
Senium	2	1	-	-	-	3
Grown-up	-	-	-	1	7	8
Total	57	23	25	24	79	208

The following methods were applied in the process of examination and evaluation: Age and sex were established by the NEMESKÉRI&HARSÁNYI method (1958). Age-groups were classified according to MARTIN's categories (1928). Facial skeleton and brain case measurements were taken in accordance with MARTIN's methodology (1928). Measurements and indices were grouped conforming to the ALEXEYEV&DEBETS categories (1964). Primary taxonomical analysis was based on the DEBETS&TÓTH principles (TÓTH 1958). Secondary taxonomical characteristics were studied by LIPTÁK's method (1954, 1957, 1965, 1969). Stature was determined by BREITINGER's (1947) method for the males and by BACH's (1965) for the females. Stature was reconstructed according also to PEARSON's method (1899). The ABO blood group type was identified from the protein extracted from the bones by the elution method. The authors attempted to establish the relative age of the burial by the HARSÁNYI&SANTORA (1974) method, on the basis of the distributions of proteins.

PALEODEMOGRAPHICAL ANALYSIS

Distribution according to age and sex is given in Table 1. 90 infant and juvenile individuals of 208 individuals were found to be suitable for analysis. There were 45 specimens from the group infans I and 20 from the group infans II. Among the 118 grown-ups 74 males and 35 females could be identified. That is, the number of males is more than twice that of females! The sex or age of 8 individuals could not be determined. As far as age groups are concerned it can be stated that 28.6% of the females and 21.6% of the males died in the adult age. 75.7% of the males reached a mature age. At the same time, only 65.7% of the females did so. The facts indicate much less favourable mortality conditions for the females than for the males.

GENERAL ANTHROPOLOGICAL ANALYSIS

Males: Brain case, according to the mean values, medium long, but short skulls also frequently occur (Tables 2, 4, 14). Extremely narrow and narrow brain cases occurring most frequently. Most skulls very high, but low, medium high and high skulls also present in equal

*The authors wish to say many thanks to L. Zs. Santora (Institute of Criminological Technology of the Ministry of the Interior) and to H. Zs. Váczi (Forensic Medicine Institute, Budapest) for determining blood groups.

portions. According to the mean values the series is high. It can be stated, on the basis of the calculated indices, that hyperdolichocranial and dolichocranial crania are the most common, but mesocrans are present at almost the same ratio. The series can be characterized as dolichocranial according to the means. The mean value of the length-height cranial index indicates hypsicrany, but the majority of skulls is orthocranic and a lesser number of them hyperhypsicranial; hyperacrocrania is typical according to the width-height index. The transversal-frontoparietal index mean points towards eurymetopy but hypereurymetopic, metriometopic and eurymetopic foreheads occur in equal quantities.

Skull circumference sphenoid or ovoid in norma verticalis. In norma occipitalis it is bomb- and house-shaped. Glabella moderately drawn back (degree Broca 3), arcus superciliaris limited. Protuberantia occipitalis externa weak or marked (degree Broca 3 and 2), linea nuchae moderate or marked. Processus mastoideus big or very big, muscle insertion pronounced (Table 7).

The facial skeleton can be characterized by the following features: Zygomatic arc medium wide in the average but it is clear from the distribution that facial skeletons suitable for analysis have mainly a very narrow check bone. Midface generally wide and medium wide or narrow. Morphological face-height value and upper face height medium high. Orbitae very low, low and medium high at the same rate. Arc low and very narrow in the average. Nasal cavity medium high and medium wide in the averages, but it is evident from the distribution that narrow noses make up the majority of the male series. Velum very long and medium wide. Indices reveal leptoprosopic faces. Mean value of upper face lepten but all categories occurring from euryen to lepten. Orbita most frequently hypsiconch, but mesoconch according to its mean value. Nose leptorrhine and mesorrhine. Palate leptostaphyline in the average, but all categories are represented in the series (Tables 2, 4).

Some morphological characteristics of the face are summarized in the followings: Spina nasalis anterior developed to 3 and 2 degrees. Fossa canina small (Table 7). A moderate alveolar prognathism recognizable. Bilateral tubercle of mandible rather frequent.

Females: Brain case, according to the mean values, medium long, high, narrow (Tables 3, 4, 15). However, it is clearly evident from the distribution that medially narrow and very narrow skulls are present in the same proportion. Dolichocranial according to the length-width index, but hyperdolichocranial, dolichocranial and mesocranial by the mean value of the length-height index; in fact, all categories except hyperhypsicrany can be found within the series. Hyperacrocrany can be established on the basis of the width-height index. Eurymetopy is typical according to the mean value of the transversal-frontoparietal index, but the bulk of the skulls is hypereurymetopic.

Cranial circumference in norma verticalis sphenoid in most cases and bomb-shaped in norma occipitalis. Glabella mainly not drawn at all or drawn only to a very small extent (degree Broca 1 and 2). Protuberantia occipitalis externa distinguished (Broca 1) and squama occipitalis often plain (Broca 0). Processus mastoideus medium or small (Table 7).

The facial skeleton can be characterized by the following features: Medium wide midface with narrow zygomatic arc. Face and midface low according to the means. Nasal cavity medium wide and medium high. Velum medium wide and medium high in the average. According to the mean values of indices face leptoprosopic, mesen. Orbita mesoconch, nasal cavity mesorrhine. Palate hyperleptostaphyline (Tables 3, 4). It should be remarked here that the number of cases is unfortunately very limited.

Some morphological characteristics of the face are summarized in the followings: Spina nasalis anterior developed to 2 and 3 degrees. Fossa canina small (Table 7). A moderate alveolar prognathism can be noticed. Trigonum mentale rounded or weakly expressed.

Only the measurements necessary for the reconstruction of stature were taken on the skeletal bones. According to BREITINGER's pattern the average stature of males was 166.86 cm, big-medium. The range of variation was 155.50-176.00 (Table 16). The value of stature calculated by PEARSON's method was 164.48 cm, medium (Table 5). The range of variation was 149.50-174.74. According to BACH's scheme the average stature of females was 158.29 cm, big-medium. The range of variation was 150.00-164.50 (Table 17). The value of stature calculated by PEARSON's method was 154.27 cm, medium (Table 6). The range of variation was 148.12-160.98. On the average the difference between the stature of the two sexes was about 9-10 cm. When taking into account the range of variation as well it can be stated that as far as their stature was concerned the males presented a much wider spectrum of differences (20-25 cm) than the females (12-14 cm).

ANATOMICAL VARIATIONS AND ABNORMALITIES

Anatomical variations and abnormalities could be identified in 109 cases within the series of Visegrád (Table 8).

Os apicis could be found in 8 individuals (4 adults, 2 children and 2 juveniles). Os bregmaticum and os incae both occur in only one instance. Os epiptericum could be identified on the skulls of 2 males and one juvenile. Narrowing sutura sphenoparietalis could be seen on another juvenile cranium. Sutura metopica was found on one female skull. Ossa wormiana occurred in an astonishing small number, within our series. It could be identified only in one infans II and 2 juvenile specimens. Torus palatinus sagittalis developed on the maxillae of 2 males. Torus mandibularis occurred in a great number of cases (28) mainly in males (17). One mature male skull (Grave No. 146) is scaphocephalic because of early ossification of sutura sagittalis (Plate 1). Palatochisis on the palate of an inf. I (Grave No. 30).

Among the 50 abnormalities found on skulls 34 could be located on grown-up crania. Males from a larger part of individuals (26) affected by abnormalities than do the females. It can be traced back to the larger frequency of torus mandibularis on males.

There are the following abnormalities on the postcranial material: We found spina bifida of various positions in 8 cases. It could be found in more males (Grave No. 29: S_1, Grave No. 80, Grave No. 93: S_5, Grave No. 162, Grave No. 189: L_5, Grave No. 217: S_4, S_5) than females (Grave No. 137, Grave No. 143: L_5, S_1; Plate 2/1). We noticed sacrum bifidum in one case. Synostosis of the last lumbal vertebra and the sacrum (sacralisation) was found in one individual. Lumbalisation was identified in 4 cases. The forming of block-vertebrae could be perceived on the spinal column of 2 males (Grave No. 120: L_2 and L_3, Grave No. 217: C_2, C_3). Dual dens epistrophei was observed on 3 cervical vertebrae. Foramen transversarium bipartitum was very common in our material (Plate 2/2). Foramen transversarium analysis could be carried on 197 individuals. 108 of them had no cervical vertebrae at all, or the vertebral region around the foramen transversarium was missing. Of the 89 individuals with cervical vertebrae suitable for analysis (45.2%) 49 had a normal foramen transversarium (55.1%) while a foramen transversarium bipartitum could be observed in 40 individuals (44.9%). Going into further details of the values found in the various age groups it could be stated that a dual foramen transversarium could be established in 25-33% for children and juveniles, while 53.3% of the grown-ups presented a double foramen: the males had much more foramina transversaria bipartita (26 cases, 59.1%) than the females (6 cases, 37.5%). In other words, of all cases of foramen transversarium bipartitum found in the grown-ups the males displayed 81.25% while the females only 18.75%! As SUSA & VARGA (1981) reported on it, this anatomical variation - which is presumably inherited - is a frequent phenomenon. According to these authors, this abnormality occurs with frequencies in the range of 22.7-47.2 percent within the various series.

From the total of 59 abnormalities registered, 37 were found on male postcranial skeletons and 9 on female ones. It can also be stated for the complete skeletons that the males bore some sort of abnormality more frequently than did the females (Table 8).

PATHOLOGICAL CHANGES

Within the Visegrád series cranial lesions could be found on 2 skulls. Both cases occurred on male skulls. On the skull of Grave No. 148 a healed cut could be found in the left frontal region. A healed linear fracture could be detected on the frontal bone of the skull No. 161. Probably both wounds resulted from sword cuts.

Long bones and vertebra lesions were present in 10 cases (7 males, 3 females). Both femora of female No. 20 healed with axial deviation. The male from Grave No. 138 had a radius fracture healed without axial deviation. We found recovered broken ribs in two cases: male No. 176 had his right side third rib and female No. 182 had her left side second one.

Clavicle fractures can be considered as relatively frequent. Traces of healed fractures could be seen on the right collar-bone of male No. 25 and on the left on male No. 146 (Plate 3/1). The right clavicle of male No. 161 healed without axial deviation but with shortening (it should be remarked here that this individual also carried the trace of a cut on his frontal bone). The right collar-bone of male No. 184 recovered with axial divergence and with much callus.

Deformations indicating vertebral fractures could be identified in two cases: there is a trace of a previous fracture on the cracked, spondylotic vertebrae of male No. 28 and on the 10th, 11th dorsal vertebrae of female No. 159 (Plate 3/2).

Spondylosis occurred quite frequently (25 cases) within our material, mainly on males (22 cases). The following individuals bore it on their lumbal sections: 28, 80, 95, 119, 120, 132, 147 (moderate), 148, 160, 181, 189, 217. This kind of deformation appeared on the thoracic as well as lumbal regions of individuals No. 75, 93, 139, 179. There was expressed cervical, thoracic and lumbal spondylosis in the male No. 201. All vertebrae of male No. 161 were spondylotic. Spondylosis and spondylarthrosis were jointly present in males No. 154,173, 217. The right clavicle and scapula of individual No. 217 ossified together. The female presented only 3 cases of spondylosis: in the lumbal section (No. 92), in the thoraco-lumbal section (No. 124) and in the lumbal and lower dorsal section (No. 159).

The hip-bone of male No. 161 is markedly arthrotic on the upper edge of its acetabulum. Exostosis could be found on the left ilium of male No. 181. The medial surface of the trochlea of male humerus No. 184 is completely eburneated. Female No. 208 had scoliosis with a left side curve. Schmoll hernia was present on the vertebrae of male No. 93. Features indicating myeloma could be recognized on the male skull No. 144/a.

TAXONOMIC ANALYSIS

Unfortunately, primary taxonomic characteristics could be analysed only on 7 male and 3 female crania (Tables 9-10). The nasomalar angle of one male face (No. 161) bore Mongoloid characteristics. Further 4 males (No. 161, 179, 184, 185) and 1 female (No. 182) crania were of some intermediate type. 3 males (146, 176, 189) had dacryal indices close to the value of Mongoloids and the females presented intermediate characteristics. The simotical index value of 2 male skulls (176, 189) were between the values typical for Mongoloids and Europoids. The same index of 2 female faces (182, 186) came rather close to the Mongoloid standard. When evaluating all the characteristics together, a small scale, non-dominant Mongoloid influence can be observed on the male skulls No. 176, 189 and on the female cranium No. 182.

Secondary taxonomix characteristics could be studied on 14 individuals (9 males, 5 females) (Table 11). The Cromagnoid group was presented by one male (No. 148) and one female skull (No. 188). The Nordoid group made up the majority of crania with 4 males (No. 146, 161, 176, 186) and 2 females (172, 186) (Plates 4-5). The Mediterranean group was presented by one male (No. 203) and one female (No. 137). The Brachycranial group consisted of 3 males (No. 179, 184, 185) and 1 female (182) of the Pamirian type (Plate 6).

As a summary we may state that the dolichocranial elements (71.44%) made up the larger part of our series. Within this the Nordoid group gave the most significant contribution (42.86%). The Cromagnoid and Mediterranean groups were present in the same rate (14.29%). The Brachycrans were a most important group (providing the second largest number of cases), 28.57% of all the skulls belonged here.

COMPARATIVE ANALYSIS

We compared our material to 23 Arpad period male and female series, to 3 series from the age of the Conquest as well as to the 4 groups (A, B, C, D) of the 10th century Hungarians separated by ÉRY (1978) and to the geographic group of Arpad period Hungarians (TÓTH 1974, 1980) (Figs 1-8).

Although a clearly perceptible difference exists between the findings from Visegrád and the series compared to it - as the 8, 45, 48, 8:1, 52:51, 54:55 measurements and indices and ALEXEYEVA's special indices (1966) indicate it by their topographic data - the male series nevertheless shows a relative proximity to that of Orosháza-Rákóczitelep and Szatymaz-Vasútállomás (Figs 9-10), while the females show it to that of Pusztapáka, Zenta-Paphalom and Szatymaz-Vasútállomás (Figs 11-12).

Unfortunately, we could compare primary taxonomic characteristics to those of merely a few Arpad period cemeteries and the Conquering Hungarians. On the basis of it, the males are the most similar to those of Nagykőrös, Esztergom-Vasútállomás and Szabolcs-Petőfi ut-

ca (Figs 13-16) and the females to the female groups of Helemba, Szabolcs-Petőfi utca and Esztergom-Vasútállomás (Figs 17-20).

PFC (90.84) and IC (-4.46) values of the Visegrád series (males and females together) present the most marked similarity to Helemba, Orosháza-Rákóczitelep and to the average of Europoids (Fig. 21).

The comparison of the results of taxonomic examinations are as follows:

As it is known (LOTTERHOF 1975), two different groups can be separated on the basis of type differences among the cemeteries of Transdanubian series. One of them comprises the environs of Veszprém and Székesfehérvár. The Europo-brachycranial elements - which are considered as the Conquering Hungarians and their descendants - are dominant in the cemeteries of Veszprém (ACSÁDI&NEMESKÉRI 1957). The anthropological material of Visegrád can,by the type and importance of the taxa present, also be included in this group as well as the series of Esztergom. It is obvious from the comparison of secondary taxonomic characteristics that our cemetery bears the largest assemblance to the cemetery of Esztergom-Vasutállomás - geographically located in its very close proximity - according to the sequence and significance of the types present. In the Esztergom population the majority of the crania belongs to the Brachycranial groups (41.7%). The Mediterranean group occures less frequently (25.0%). The fewest are the skulls of the Cromagnoid and Nordoid groups (16.7%).

RESULTS OF THE BLOOD GROUP TEST

Blood group test could be carried out by absorption-elution methods. However positive ABÓ blood group test was possibly only in 103 cases (51.5%). It can be stated that blood group A occurred with the greatest frequency (24%). B and AB groups presented a very low rate. Only 6.5% of all individuals belonged to group B and 3.0% to group AB (Table 12).

Though this study is not intended to be one discussing problems it is appropriate to remark here that the absorption method produces distortion by LENGYEL's opinion (1975b). This method classifies more individuals to groups 0 and AB and less to group A than in reality there are. As a result of it the absorption method results in distortion when calculating gene frequencies too (LENGYEL 1975b). All these presumptions are very difficult to prove or to unprove for in our cemetery only a very limited number of AB and B individuals were available.

As far as our data can be compared at all to LENGYEL's data (1975a), because of the difference of the methods used to determine blood groups, we may state that the series of Visegrád presents similarity to the samples of Kál and Oroszvár concerning A character (Table 13). However we must not leave out of consideration the fact that B allele is present only in a very limited number of cases within the sample of Visegrád.

Supposing the method of determination did not disfigure or in other words it was not possible to indicate individual characters in similar (or approximately similar) rates in the skeletal samples then these results are informative anyway - if not in absolute numbers than at least in their percentages.

Here we must mention our doubts because it is possible that "missing" individuals with B blood group are to be found among individuals with undetermined (undeterminable) blood groups.

REFERENCES

ACSÁDI, Gy. & NEMESKÉRI, J. (1957): Contributions a la reconstruction de la population de Veszprém. X^{e} et XI^{e} siècles. - Annls hist.-nat. Mus. natn. hung., 49: 435-467.

ACSÁDI, Gy. & NEMESKÉRI, J. (1959): La population de Székesfehérvár X^{e} et XI^{e} siècles. - Annls hist.-nat. Mus. natn. hung., 51: 493-564.

ALEXEYEV, V.P. & DEBETS, G.F. (1964): Kraniometriya. Metodika antropologicheskikh isledovanii.- Nauka, Moskva, 128 pp.

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

ALLODIATORIS, I. (1937): Adatok az Árpádkori Alföldi magyarság anthropológiájához [Data on the anthropology of the Arpadian Age population of Great-Plain]. - Bölcsészdoktori értekezés, Budapest, 60 pp.
BACH, H. (1965): Zur Berechnung der Körperhöhe aus den langen Gliedmassenknochen weiblicher Skelette. - Anthrop. Anz., 29: 12-21.
BARTUCZ, L. & FARKAS, Gy. (1958): Die Bevölkerung von "Csésztó" in der Árpádenzeit aus anthropologischen Gesichpunkte betrachtet. - Acta biol., 4: 245-283.
BOTTYÁN, O. (1972): Az oroszvári X-XI. századi népesség embertani vizsgálata (The anthropological examination of the X-XI century population at Oroszvár (Hungary)). - Anthrop. hung., 11: 83-136.
BREITINGER, E. (1947): Zur Berechnung der Körperhöhe aus den langen Gliedmassenknochen. - Anthrop. Anz., 14: 249-274.
DEBETS, G.F. (1961): O nekotorykh naprevleniyakh izmenenii v stroenii cheloveka sovremennogo vida. - Sov. Etnogr., 2: 9-23.
DEBETS, G.F. (1964): Ob antropologicheskom tipe drevnego naseleniya Finlandii. - Sovr. Antr., 233-239.
DEZSŐ, Gy., ÉRY, K., HARSÁNYI, L., HUSZÁR, Gy., NEMESKÉRI, J., NOZDROVICZKY, S., THOMA, A., TÓTH, T. & WENGER, S. (1963): Die Spätmittelalterliche Bevölkerung von Fonyód. - Anthrop. hung., 6: 1-166.
ÉRY, K. (1968): Reconstruction of the tenth century population of Sárbogárd on the basis of archaeological and anthropological data. - Alba Regia (1967-68) (Székesfehérvár), 8-9: 93-147.
ÉRY, K. (1970): Anthropological studies on the tenth century population at Kál, Hungary. - Anthrop. hung., 9: 9-62.
ÉRY, K. (1971): The anthropological examination of a tenth century population at Tengelic. - Anthrop. hung., 10: 49-89.
ÉRY, K. (1978): Regionális különbségek a magyarság X. századi embertani anyagában (Regional differences in the anthropological material of the tenth century Hungarians). - Anthrop. közl., 22: 77-86.
ÉRY, K. (1979): A taliándörögdi Szent András templom középkori temetkezéseinek embertani vizsgálata (An anthropological examination of the Medieval burials of the church of St. Andrew in Taliándörögd). - A Veszprém megyei Múz. közl., 14: 215-244.
HARSÁNYI, L. & SANTORA, Zs. (1974): Adatok a csontszöveti fehérjék vizsgálatához (Data to the examination of bone tissue proteins). - Anthrop. közl., 18: 78-89.
KOROMPAI, B. (1974): Nagytálya középkori (XIII-XVI. századi) templomának belsejében feltárt embertani anyag elemzése (The analysis of anthropological material found inside the Middle-Age church of Nagytálya). - Egri Múz. Évkönyve (1973-74), 11-12: 75-130.
LENGYEL, I. (1975a): Paleoserology. - Akadémiai Kiadó, Budapest.
LENGYEL, I. (1975b): Paleoszerológiai vizsgálatok [Paleoserological examination]. - Kandidátusi ért. tézisei, Budapest, 16 pp.
LIPTÁK, P. (1954): A típusok 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. (1957): Awaren und Magyaren im Donau-Theiss Zwischenstromgebiet. - Acta arch. hung., 8: 199-268.
LIPTÁK, P. (1965): On the taxonomic method in paleoanthropology (Historical anthropology).- Acta biol., 11: 169-183.
LIPTÁK, P. (1969): Embertan és emberszármazástan [Anthropology and geneology]. - Tankönyvkiadó, Budapest, 284 pp.
LIPTÁK, P. & FARKAS, Gy. (1962): Anthropological analysis of the Arpadian Age population of Orosháza-Rákóczitelep. - Acta biol., 8: 221-236.
LIPTÁK, P. & FARKAS, Gy. (1967a): A Békés-povádzugi őskori és 10-12. századi temető csontvázanyagának embertani vizsgálata (Anthropologische Untersuchung an den aus der Urzeit und aus dem 10-12. Jahrhundert stammenden Skelettmaterialen des Gräberfeldes Békés-Povádzug). - Anthrop. közl., 11: 127-163.
LIPTÁK, P. & FARKAS, Gy. (1967b): Anthropological examination of the Arpadian Age population of Szatymaz (10th to 12th centuries). - Acta biol., 13: 71-119.
LIPTÁK, P. & MARCSIK, A. (1965): A Téglás-angolkerti középkori (XI-XIV. századi) temető

embertani anyagának ismertetése (Das anthropologische Material des Gräberfeldes Téglás-Angolkert vom Mittelalter (aus dem XI-XIV. Jahrhundert)). - Déri Múz. Évkönyve (Debrecen), 69-96.
LOTTERHOF, E. (1974): Some data to the anthropology of the population of North Plain in the Arpadian Age. - Anthrop. hung., 13: 87-122.
LOTTERHOF, E. (1975): Some anthropological problems of the Second Millennium in Hungary. - Annls hist.-nat. Mus. natn. hung., 67: 343-355.
MARCSIK, A. (1967): Analysis of the anthropological material of the 10-12th century cemetery in Aldebrő-Mocsáros. - Acta biol., 13: 163-174.
MARCSIK, A. (1970): Anthropological investigation of the cemetery at Kardoskút-Fehértó from the 11th-12th c. - Acta biol., 16: 155-162.
MARTIN, R. (1928): Lehrbuch der Anthropologie. II. Jena, 579-1182.
NEMESKÉRI, J., ÉRY, K., KRALOVÁNSZKY, A. & HARSÁNYI, L. (1961): Data to the reconstruction of the population of an eleventh century cemetery: Gáva-Market (A methodological study). - Crania hung. 4: 1-64.
NEMESKÉRI, J. & HARSÁNYI, L. (1958): A csontvázleletek életkorának meghatározási módszereiről és azok alkalmazhatóságáról (Die Altersbestimmungsmethoden am Skelett und ihre Anwendungsmöglichkeiten). - Az MTA Biol. Csop. közl., 1: 115-164.
NEMESKÉRI, J., LIPTÁK, P. & SZŐKE, B. (1953): Le cimetière du XI^{e} siècle de Kérpuszta. - Acta arch., 3: 205-279.
PAP, I. (1979a): Data on the anthropology of the population of North-East Transdanubia. - Anthrop. hung. (1978-79), 16: 5-76.
PAP, I. (1979b): Data on the anthropology of the Arpadian Age population of the plain between Rivers Danube and Tisza. - Anthrop. hung. (1978-79), 16: 77-116.
PAP, I. (1981): Anthropological investigation of the Arpadian Age population of Szabolcs-Petőfi utca. - Anthrop. hung. (1980-81), 17: 65-107.
PEARSON, K. (1899): On the reconstruction of the stature of Prehistoric Races. - Mathem. Contrib. to the Theory of Evolution, V. Phil. Transact. of the Roy. Soc. Ser. A. 192. 169-244.
SUSA, É. & VARGA, T. (1981): Die Variationen des Foramen transversarium. - Homo, 32(2): 89-96.
SZŐKE, M. (1971): Régészeti füzetek, 24: 43-44.
SZŐKE, M. (1973): Régészeti füzetek, 26: 118-119.
SZŐKE, M. (1975): Régészeti füzetek, 28: 106.
SZŐKE, M. (1977): Régészeti füzetek, 30: 49-50.
SZŐKE, M. (1978): Régészeti füzetek, 31: 91-92.
SZŐKE, M. (1979): Régészeti füzetek, 32: 105.
TÓTH, T. (1958): Profilation horizontale de crâne facial de la population ancienne et contemporaine de la Hongrie. - Crania hung., 3: 3-126.
TÓTH, T. (1965): A honfoglaló magyarság ethnogenezisének problémája (Problemes de l'ethnogenese des hongrois conquérants). - Anthrop. közl., 9: 139-149.
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. (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): Somatologiya i paleoantropologiya naseleniya Vengrii. - Doct. dissertation I-II., Budapest, 277-298.
TÓTH, T. (1980): Some anthropological problems of the Early postglacial and Historical Europoids. - Annls hist.-nat. Mus. natn. hung., 72: 295-307.
VARGA, T., SUSA, É. & SANTORA, Zs. (1982): Anthropological characterization of the Arpadian-Age cemetery at Visegrád. - Humanbiol. Budapest, 10: 77-80.
WENGER, S. (1971): Contributions a l'anthropologie de la population hongroise du Moyen Age. - Anthrop. hung., 10: 91-158.

Authors' addresses: DR. ILDIKÓ PAP

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

DR. ÉVA SUSA

Institute of Experts
in Forensic Medicine
Budapest, P.O. Box 31
H-1363

Tables 2-3 Parameters of the male and female cranial series

MALES

Martin No.	N	Range	M	s
1	25	166- 196	180.84	8.23
10	13	176- 204	186.23	8.22
5	12	89- 105	99.50	5.84
8	30	117- 145	132.20	6.80
9	25	87- 105	95.12	5.78
17	11	131- 152	141.00	7.21
20	16	121- 142	130.69	5.36
38	10	1331- 1686	1509.80	116.62
40	8	86- 138	101.75	18.87
45	6	114- 143	130.80	8.07
46	8	91- 104	99.13	6.71
47	7	116- 129	120.00	4.55
48	8	67- 74	70.75	2.60
51	9	20- 43	37.11	6.77
52	9	29- 35	32.56	2.24
54	8	23- 27	24.63	1.60
55	8	50- 55	52.25	1.98
62	7	42- 58	51.14	6.54
63	8	35- 44	40.75	3.49
65	16	89- 142	114.94	14.42
66	24	89- 115	100.58	11.21
69	30	22- 38	28.30	3.88
70	31	43- 75	60.55	8.50
8:1	20	63.10-83.92	74.07	4.95
17:1	11	72.96-86.13	77.77	4.09
17:8	11	92.91-13.30	105.54	11.10
9:8	22	61.38-85.59	71.12	5.91
47:45	6	84.62-108.00	94.87	7.93
48:45	6	50.35-63.16	55.21	4.64
52:51	9	68.97-86.37	82.66	8.05
54:55	8	41.82-51.92	47.16	2.97
63:62	7	62.50-82.69	79.67	12.40

FEMALES

Martin No.	N	Range	M	s
1	11	154- 201	174.36	11.99
10	5	161- 182	172.00	8.80
5	4	84- 141	95.50	9.47
8	15	121- 137	131.27	4.91
9	15	85- 104	95.00	4.93
17	3	123- 143	132.33	-
20	6	122- 129	124.83	2.71
38	4	1091- 1428	1266.50	-
40	3	91- 132	111.50	-
45	2	117	117.00	-
46	2	93	93.00	-
47	3	107- 111	108.33	-
48	3	63- 67	65.00	-
51	3	38- 40	39.33	-
52	3	28- 35	31.67	-
54	3	23- 25	24.33	-
55	3	47- 51	48.33	-
62	2	40- 54	47.00	-
63	2	40- 42	41.00	-
65	7	105- 121	113.57	5.47
66	11	78- 98	93.00	6.07
69	14	19- 31	25.93	3.93
70	12	46- 69	57.58	7.88
8:1	11	68.16-85.06	74.97	4.83
17:1	4	72.35-81.71	76.85	-
17:8	3	89.78-108.00	101.26	-
9:8	13	65.89-78.20	72.24	4.18
47:45	2	91.45	91.45	-
48:45	2	53.81-55.56	54.69	-
52:51	3	70.00-111.00	87.00	-
54:55	3	48.97-53.19	50.39	-
63:62	2	74.07-105.00	74.07	-

Table 4 Distribution of measurements and indices according to ALEXEYEV-DEBETS

Martin No.	Classification			Male	Female
	Male	Female		N	N
1	161- 171	153- 163	very short	4	2
	172- 177	164- 169	short	6	1
	178- 184	170- 175	medium	8	3
	185- 190	176- 181	long	3	3
	191- 201	182- 191	very long	4	1
5	88- 95	84- 90	very short	4	1
	96- 99	91- 94	short	4	1
	100- 103	95- 98	medium	1	1
	104- 107	99- 102	long	2	-
	108- 115	103- 109	very long	1	1
8	125- 133	120- 128	very narrow	11	5
	134- 138	129- 133	narrow	10	4
	139- 144	134- 139	medium	4	6
	145- 149	140- 144	wide	1	-
	150- 158	145- 153	very wide	-	-
9	82- 89	79- 86	very narrow	6	1
	90- 93	87- 90	narrow	5	-
	94- 98	91- 95	medium	7	10
	99- 102	96- 99	wide	4	2
	103- 110	100- 107	very wide	3	2
17	118- 126	113- 120	very low	-	-
	127- 131	121- 125	low	2	1
	132- 136	126- 130	medium	2	-
	137- 141	131- 135	high	2	1
	142- 150	136- 143	very high	4	1
38	1030-1227	921-1096	very small	-	1
	1228-1337	1097-1195	small	1	-
	1338-1462	1196-1307	medium	2	1
	1463-1572	1308-1406	large	4	1
	1573-1770	1407-1582	very large	3	1
40	83- 91	80- 87	very short	3	1
	92- 96	88- 92	short	2	1
	97- 101	93- 97	medium	-	-
	102- 106	98- 102	long	1	-
	116-	111-	very long	2	2
45	92- 98	109- 116	very narrow	-	-
	99- 102	117- 121	narrow	-	2
	103- 106	122- 127	medium	-	-
	107- 110	128- 132	wide	-	-
	111- 117	133- 140	very wide	1	-
	118-			5	

Table 4 (Cont. 1)

Martin No.	Classification			Male	Female
	Male	Female		N	N
46	82- 89	78- 84	very narrow	-	-
	90- 94	85- 89	narrow	2	-
	95- 99	90- 94	medium	2	2
	100- 104	95- 99	wide	3	-
	105- 112	100- 106	very wide	1	-
47	96- 107	89- 99	very low	-	-
	108- 114	100- 106	low	-	-
	115- 122	107- 113	medium	6	3
	123- 129	114- 120	high	1	-
	130- 141	121- 131	very high	-	-
48	58- 64	54- 59	very low	-	-
	65- 68	60- 63	low	2	1
	69- 73	64- 68	medium	5	2
	74- 77	69- 72	high	2	-
	78- 84	73- 78	very high	-	-
51	36.0-39.1	34.6-37.6	very narrow	5	-
	39.2-40.9	37.7-39.3	narrow	-	1
	41.0-42.9	39.4-41.2	medium	2	2
	43.0-44.7	41.3-42.9	wide	-	-
	44.8-47.9	13.0-46.0	very wide	-	-
52	27.9-31.2	27.7-31.0	very low	3	1
	31.3-33.1	31.1-32.9	low	3	1
	33.2-35.2	33.0-35.0	medium	3	1
	35.3-37.1	35.1-36.9	high	-	-
	37.2-40.5	37.0-40.3	very high	-	-
54	19.5-22.6	18.7-21.7	very narrow	-	-
	22.7-24.4	21.8-23.4	narrow	5	1
	24.5-26.4	23.5-25.4	medium	1	2
	26.5-28.2	25.5-27.1	wide	2	-
	28.3-31.4	27.2-30.2	very wide	-	-
55	43- 47	40- 44	very low	-	-
	48- 50	45- 47	low	2	2
	51- 53	48- 50	medium	4	-
	54- 56	51- 53	high	2	1
	57- 61	54- 58	very high	-	-
62	36.8-41.6	35.0-39.7	very short	-	-
	41.7-44.4	39.8-42.3	short	2	1
	44.5-47.5	42.4-45.1	medium	-	-
	47.6-50.3	45.2-47.7	long	-	-
	50.4-55.2	47.8-42.9	very long	3	-
	55.3-	43.0-		2	1

Table 4 (Cont. 2)

Martin No.	Classification			Male	Female
	Male	Female		N	N
63	30.9-35.5	29.4-33.8	very narrow	1	-
	35.6-38.2	33.9-36.4	narrow	1	-
	38.3-41.3	36.5-39.3	medium	2	-
	41.4-44.0	39.4-41.9	wide	3	1
	44.1-48.7	42.0-46.4	very wide	1	1
65	- 100			3	-
	101 - 110	94 - 104	very narrow	2	-
	111 - 116	105 - 109	narrow	2	1
	117 - 122	110 - 115	medium	5	3
	123 - 128	116 - 120	wide	2	2
	129 - 138	121 - 131	very wide	1	-
	139 -			1	-
66	- 78			1	-
	79 - 90	74 - 85	very narrow	3	1
	91 - 96	86 - 90	narrow	4	2
	97 - 103	91 - 97	medium	7	6
	104 - 109	98 - 102	wide	4	2
	110 - 121	103 - 114	very wide	4	-
	122 -			1	
69		-21.2		4	3
	23.6-28.6	21.3-25.8	very low	14	5
	28.7-31.4	25.9-28.3	low	7	2
	31.5-34.5	28.4-31.2	medium	3	3
	34.6-37.3	31.3-33.7	high	1	1
	37.4-42.4	33.8-38.3	very high	-	-
70	40- 48	45- 53	very low	4	4
	49- 52	54- 58	low	-	2
	53- 57	59- 63	medium	6	3
	58- 61	64- 68	high	6	2
	62- 70	69- 77	very high	10	1
	71-			5	-
8:1		-68.4		2	1
	67.7-73.2	68.5-74.1	very long	6	3
	73.3-76.4	74.2-77.3	long	5	3
	76.5-79.0	77.4-80.8	medium	4	2
	79.1-83.1	80.9-84.0	short	2	-
	83.2-88.7	84.1-89.7	very short	1	1
17:1	63.8-69.2	63.9-69.4	very low	-	-
	69.3-72.3	69.5-72.5	low	-	1
	72.4-75.6	72.6-75.8	medium	5	1
	75.7-78.7	75.9-78.9	high	2	1
	78.8-84.2	79.0-84.5	very high	3	1
	84.3-			1	-

Table 4 (Cont. 3)

Martin No.	Classification			Male	Female
	Male	Female		N	N
17:8	80.2- 87.9	79.4- 87.1	very low	-	-
	88.0- 92.3	87.2- 91.4	low	-	1
	92.4- 97.0	91.5- 96.1	medium	2	-
	97.1-101.4	96.2-100.4	high	2	-
	101.5-109.2	96.2-100.4	very high	4	2
	109.3-	100.5-108.2			
9:8	57.0- 62.7	57.3- 63.0	very narrow	3	-
	62.8- 66.0	63.1- 66.3	narrow	2	2
	66.1- 69.6	66.4- 69.9	medium	5	3
	69.7- 72.9	70.0- 73.2	wide	5	2
	73.0- 78.7	73.3- 79.0	very wide	6	6
	78.8-			1	
47:45	71.3- 80.5	71.0- 90.1	very wide	-	-
	80.6- 85.8	90.2- 85.4	wide	1	-
	85.9- 91.6	85.5- 91.1	medium	1	-
	91.7- 96.9	91.2- 96.4	narrow	3	2
	97.0-106.2	96.5-105.6	very narrow	-	1
	106.3-			1	
48:45	42.8- 48.3	42.6- 48.1	very wide	-	-
	48.4- 51.4	48.2- 51.2	wide	2	-
	51.5- 54.9	51.3- 54.7	medium	1	2
	55.0- 58.0	54.8- 57.8	narrow	2	1
	58.1- 63.6	57.9- 63.4	very narrow	1	-
52:51	65.1- 73.8	67.4- 76.4	very low	1	1
	73.9- 78.7	76.5- 81.5	low	1	1
	78.8- 84.3	81.6- 87.3	medium	2	1
	84.4- 89.2	87.4- 92.4	high	4	-
	89.3- 98.0	92.5-101.5	very high	1	-
		101.6-			1
54:55	35.4- 42.5	36.1- 43.3	very narrow	-	-
	42.6- 46.6	43.4- 47.5	narrow	4	-
	46.7- 51.1	47.6- 52.1	medium	3	2
	51.2- 55.2	52.2- 56.3	wide	1	1
	55.3- 62.4	56.4- 63.6	very wide	-	-
63:62	- 63.3			1	-
	63.4- 75.7	63.5- 75.8	very narrow	1	1
	75.8- 82.6	75.9- 82.7	narrow	2	-
	82.7- 90.3	82.8- 90.5	medium	1	-
	90.4- 97.2	90.6- 97.4	wide	1	-
	97.3-109.6	97.5-109.8	very wide	1	1

Tables 5-6 Parameters of the male and female post-cranial series

MALES

MARTIN No.		N	Range	M	s
Humerus	1 R	31	277-366	312.94	34.79
	L	26	277-349	308.88	22.83
	2 R	31	255-466	310.45	38.14
	L	24	250-341	308.33	25.92
Radius	1b R	21	200-259	240.57	19.12
	L	13	243-274	252.69	12.68
Ulna	1 R	16	240-297	267.94	15.23
	L	14	234-286	267.86	18.29
Femur	1 R	40	382-504	451.83	32.05
	L	29	390-502	460.34	26.22
	2 R	34	373-495	452.88	31.90
	L	25	395-494	459.60	25.59
Tibia	1a R	30	328-407	372.47	24.44
	L	23	327-414	375.39	22.78
	1b R	28	316-399	366.43	21.45
	L	24	320-398	366.08	20.46
Stature acc. to BREITINGER		48	155.50-176.00	166.86	4.94
acc. to PEARSON		48	149.50-174.74	164.48	6.51

FEMALES

MARTIN No.		N	Range	M	s
Humerus	1 R	9	257-301	275.25	14.33
	L	6	266-322	289.67	19.72
	2 R	9	270-326	287.62	33.62
	L	6	265-326	292.67	23.91
Radius	1b R	6	210-328	246.83	41.83
	L	8	211-325	235.38	37.21
Ulna	1 R	3	232-243	238.00	-
	L	3	246-315	272.30	-
Femur	1 R	14	382-451	411.93	17.14
	L	13	385-449	409.46	16.75
	2 R	15	385-454	409.93	17.08
	L	11	387-453	410.27	17.42
Tibia	1a R	14	314-350	334.14	11.40
	L	9	319-353	331.78	10.35
	1b R	14	296-345	324.43	14.75
	L	9	302-354	322.67	16.47
Stature acc. to BACH		20	150.00-164.50	158.29	3.66
acc. to PEARSON		18	148.12-160.98	154.27	4.37

Table 7

Distribution of the morphological characteristics

Characteristics	Males	Females
Norma verticalis		
ovoid	3	1
pentagonoid	1	1
ellipsoid	2	-
sphenoid	4	3
brisoid	2	2
spheroid	-	1
Norma occipitalis		
wedge form	2	-
house form	5	2
tent form	1	-
bomb form	6	4
Glabella, arous superciliaris (acc. to Harsányi)		
-2	3	7
-1	5	6
0	15	1
+1	4	-
+2	5	1
Protuberantia occ. ext. (acc. to Harsányi)		
-2	4	8
-1	6	9
0	15	5
+1	17	3
+2	1	-
Spina nasalis anterior		
Broca 1	-	-
2	-	2
3	3	2
4	2	-
5	-	-
Alveolar prognathism		
vertical	-	-
moderate	5	3
expressed	-	-

Characteristics	Males	Females
Fossa canina		
very small	1	-
small	4	3
medium	1	-
large	1	-
very large	-	1
Trigonum mentale (acc. to Harsányi)		
-2	-	2
-1	2	2
0	-	-
+1	1	1
+2	7	1
Caput femoris (acc. to Harsányi)		
-2	2	10
-1	7	10
0	8	5
+1	13	-
+2	24	-
Collo-diaphyseal angle (acc. to Harsányi)		
-2	2	2
-1	2	6
0	9	4
+1	10	2
+2	35	7
Foramen obturatorium (acc. to Harsányi)		
-2	1	1
-1	1	4
0	1	1
+1	4	1
+2	5	-
Incisura ischiadica major (acc. to Harsányi)		
-2	1	3
-1	-	4
0	9	2
+1	10	1
+2	6	2

Table 8 Anatomical variations and abnormalities

Variations, abnormalities	Inf. I	Inf. II	Juv.	Grown-ups		Total
				M	F	
Os bregmaticum	-	-	-	-	1	1
Os incae	-	-	-	1	-	1
Os apicis	-	2	2	3	1	8
Variation of pterion region	-	-	2	2	-	4
Sut. metopica	-	-	-	-	1	1
Wormiana bones	-	1	2	-	-	3
Torus palatinus sagittalis	-	-	-	2	-	2
Torus mandibularis	3	1	2	17	5	28
Scaphocephaly	-	-	-	1	-	1
Palatochisis	1	-	-	-	-	1
Total	4	4	8	26	8	50
Spina bifida	-	-	-	6	2	8
Sacrum bifidum	-	-	-	1	-	1
Sacralisation	-	-	-	-	1	1
Lumbalisation	-	2	1	1	-	4
Blockvertebra	-	-	-	2	-	2
Dual dens epistrophei	1	1	-	1	-	3
Foramen transversarium bipart.	3	2	3	26	6	40
Total	4	5	4	37	9	59
Altogether	8	9	12	63	17	109

Table 9 Parameters of the facial flatness - Males

	Characteristics	146	161	176	179	184	185	189
MC	Maxillofrontal chord	16	18	19	15	18	15	19
MS	Maxillofrontal subtense	7	7	6	5	9	7	8
BC	Bi-malar chord	99	100	104	93	95	92	98
BS	Bi-malar subtense	19	17	13	16	17	15	22
NA	Nasomalar angle	138.0	142.4	151.9	142.0	140.6	143.9	131.7
ZC	Zygomaxillar chord	98	92	105	88	85	93	99
ZS	Zygomaxillar subtense	31	22	27	22	21	23	30
ZA	Zygomaxillar angle	115.4	128.9	125.6	126.9	127.4	127.4	117.6
DC	Dacryal chord	20	24	23	17	23	17	22
DS	Dacryal subtense	8	13	10	10	13	11	9
ID	Dacryal index	40.00	54.17	43.48	58.82	56.52	64.71	40.91
SC	Simotical chord	9	7	7	8	7	9	12
SS	Simotical subtense	6	4	3	4	6	5	4
IS	Simotical index	66.67	57.14	42.86	50.00	85.71	55.56	33.33
C	Malar chord	-	54	60	51	56	54	51
S	Malar subtense	-	10	15	11	11	13	9
S:C	Malar arc index	-	18.52	25.00	21.57	19.64	24.07	17.65
FC	Fossa canina	8	5	5	4	6	7	4
IMMC	Incisure maxillo-malar chord	26	25	28	22	24	25	-
IMMS	Incisure maxillo-malar subtense	11	5	9	7	7	8	-
IMM	index	59.95	20.00	32.14	31.82	29.17	32.00	-
	72	86	86	75	86	87	86	-
	75	56	-	-	61	-	53	52
	75(1)	30	-	-	25	-	33	-

Table 10 Parameters of the facial flatness - Females

	Characteristics	137	182	186
MC	Maxillofrontal chord	19	18	19
MS	Maxillofrontal subtense	6	7	5
BC	Bi-malar chord	-	88	98
BS	Bi-malar subtense	-	14	20
NA	Nasomalar angle	-	144.7	135.6
ZC	Zygomaxillar chord	-	88	95
ZS	Zygomaxillar subtense	-	23	21
ZA	Zygomaxillar angle	-	124.9	132.3
DC	Dacryal chord	22	20	22
DS	Dacryal subtense	10	10	11
ID	Dacryal index	45.45	50.00	50.00
SC	Simotical chord	9	11	10
SS	Simotical subtense	5	4	3
IS	Simotical index	55.56	36.34	30.00
C	Malar chord	-	49	50
S	Malar subtense	-	9	9
S:C	Malar arc index	-	18.37	18.00
FC	Fossa canina	-	5	5
IMMC	Incisure maxillo-malar chord	-	28	-
IMMS	Incisure maxillo-malar subtense	-	7	-
IMM	index	-	25.00	-
	72	89	87	83
	75	37	66	-
	75(1)	32	21	-

Table 11 Taxonomic analysis

Types	Females	Males	Total (%)
Cromagnoids	1	1	2 (14.29)
Nordoids	2	4	6 (42.86)
Mediterraneans	1	1	2 (14.29)
Brachycrans	1	3	4 (28.56)
Total	5	9	14 (100.00)

Table 12 Distribution of blood groups

Blood group	Number	Percentage
A	48	24.00
B	13	6.50
0	36	18.00
AB	6	3.00
?	97	48.50
Total	200	100.00

Table 13 Blood group distribution of some Middle Ages samples*

Cemetery	Number of bone samples	Determination results (%)					Determinable
		A	B	0	AB	?	
Áldebrő-Mocsáros, 9-10th c.	31	9 (29.03)	13 (41.93)	5 (16.13)	1 (3.22)	3 (9.68)	28 (90.32)
Békés-Povádzug, 10-12th c.	50	11 (22.00)	16 (32.00)	12 (32.00)	7 (14.00)	4 (8.00)	46 (92.92)
Dunaalmás, 9-10th c.	11	2 (18.18)	4 (36.36)	1 (9.09)	3 (27.27)	1 (9.09)	10 (90.91)
Kál, 9-10th c.	66	18 (27.27)	17 (25.76)	19 (28.79)	4 (6.06)	8 (12.12)	58 (87.88)
Oroszvár, 11-13th c.	54	14 (25.92)	11 (20.37)	13 (24.07)	12 (22.22)	4 (7.41)	50 (92.59)
Sárbogárd, 9-10th c.	92	19 (20.65)	26 (28.26)	28 (30.43)	7 (7.61)	12 (13.04)	80 (86.96)
Sopronbánfalva, 11-15th c.	36	7 (19.44)	10 (27.78)	11 (30.56)	3 (8.33)	5 (13.89)	31 (86.11)
Szakony, 9th c.	7	1 (14.28)	3 (42.88)	1 (14.28)	-	2 (28.56)	5 (71.43)
Tengelic, 9-10th c.	34	7 (20.59)	11 (32.35)	8 (23.53)	3 (8.82)	5 (14.71)	29 (85.29)
Visegrád, 10-11th c.	200	48 (24.00)	13 (6.50)	36 (18.00)	6 (3.00)	97 (48.50)	103 (51.50)

*based on LENGYEL's data (1975)

Table 14

Individual cranial measurements

Males

MARTIN No.	25	28	29	36	46	52	55	61	84	87	95	123	132	135	138	139	142	144/A	145	146	147
	A	M	M	A	M	M	A	A	A	M	M	M	M	A	A	M	A	M	S	M	M
1	-	-	191	-	-	-	-	187	184	-	-	184	169	-	179	-	166	-	-	196	183
1c	-	-	-	-	-	-	-	-	-	-	-	-	178	-	-	-	-	-	-	204	-
5	-	-	-	-	-	-	-	-	89	-	-	-	-	-	-	-	-	-	-	98	-
8	-	-	-	-	-	128	-	-	138	134	-	137	-	130	132	-	133	130	117	118	134
9	-	-	-	-	-	-	-	-	-	-	-	-	105	-	87	97	98	-	-	101	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	143	-
20	-	-	-	-	-	-	-	-	-	-	-	-	121	-	-	-	-	-	-	130	-
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1491	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88	-
45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	124	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-
47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117	-
48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	-
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	-
62	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	56	-
63	-	-	-	-	-	-	-	-	-	-	-	-	43	-	-	-	-	-	-	35	-
65	-	-	-	-	-	-	-	-	-	-	-	-	135	-	119	101	-	-	91	124	100
66	-	96	-	-	-	-	103	-	-	-	106	-	108	91	105	125	98	89	71	89	103
69	27	31	28	23	-	-	27	-	-	-	24	-	31	27	24	28	23	26	24	26	26
70	-	61	-	43	64	-	63	-	45	-	-	-	71	53	54	58	55	63	53	71	47
8:1	-	-	-	-	-	-	-	-	75.00	-	-	74.46	-	-	73.74	-	-	-	-	63.10	73.22
17:1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72.96	-
17:8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	133.00	-
9:8	-	-	-	-	-	-	-	-	64.49	67.91	-	-	-	-	65.91	-	-	-	-	85.59	-
47:45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94.35	-
48:45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.03	-
52:51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68.97	-
54:55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49.09	-
63:62	-	-	-	-	-	-	-	-	-	-	-	-	82.69		-	-	-	-	-	62.50	-

Table 14 (Cont. 1)

MARTIN No.	148	154	155	160	161	164	173	176	179	181	183	184	185	189	199	200	201	209	213	217	221
	M	S	M	M	M	M	M	M	M	M	M	M	A	M	M	M	M	M	M	M	M
1	176	183	175	193	189	182	169	191	175	171	184	176	173	175	-	190	-	-	180	-	-
1c	182	-	-	-	197	190	176	195	187	184	-	181	185	179	-	-	-	-	183	-	-
5	99	-	-	-	97	97	-	112	95	97	-	102	98	105	-	-	-	-	105	-	-
8	136	-	132	134	139	140	123	139	141	134	127	141	145	131	135	125	125	-	128	136	124
9	101	-	87	92	99	98	97	103	88	93	98	95	89	89	103	90	98	-	90	102	87
17	147	-	-	-	152	136	-	147	131	136	-	131	149	138	-	-	-	-	141	-	-
20	132	-	-	-	133	135	123	142	129	130	129	128	128	134	-	-	-	-	132	139	126
38	1491	-	-	-	1615	1500	-	1680	1467	1423	-	1414	1686	1331	-	-	-	-	-	-	-
40	92	-	-	-	86	-	-	107	88	-	-	94	121	138	-	-	-	-	-	-	-
45	133	-	-	-	-	-	-	143	123	-	-	131	114	-	-	-	-	-	-	-	-
46	95	-	-	-	109	-	-	104	91	-	-	101	90	99	-	-	-	-	-	-	-
47	129	-	-	-	-	-	-	121	118	-	-	117	116	122	-	-	-	-	-	-	-
48	74	-	-	-	71	-	-	72	70	-	-	67	72	73	-	-	-	-	-	-	-
51	43	-	-	-	39	36	-	37	41	-	-	38	39	41	-	-	-	-	-	-	-
52	32	-	-	-	33	35	-	31	35	-	-	30	33	35	-	-	-	-	-	-	-
54	23	-	-	-	24	-	-	25	24	-	-	24	23	27	-	-	-	-	-	-	-
55	51	-	-	-	50	-	-	53	52	-	-	50	55	52	-	-	-	-	-	-	-
62	-	-	-	-	42	-	-	58	42	53	-	55	-	-	-	-	-	-	-	-	-
63	45	-	-	-	41	-	-	44	39	37	-	42	-	-	-	-	-	-	-	-	-
65	89	-	-	-	-	-	125	142	117	119	-	115	115	-	-	-	108	117	-	122	-
66	115	-	-	-	-	-	99	105	93	111	113	100	100	100	-	-	-	89	92	113	-
69	38	33	22	-	-	-	27	31	29	36	27	30	27	31	-	-	27	30	32	34	-
70	54	67	46	58	-	-	69	75	66	64	63	68	57	66	68	-	59	59	71	72	-
8:1	77.27	-	75.43	69.43	73.54	76.92	72.78	72.77	80.57	78.36	69.02	80.11	83.92	74.86	-	85.79	-	-	71.11	-	-
17:1	83.52	-	-	-	75.13	74.73	-	76.96	74.86	79.53	-	74.43	86.13	78.86	-	-	-	-	78.33	-	-
17:8	111.00	-	-	-	109.00	97.14	-	106.00	92.91	101.00	-	92.91	103.00	105.00	-	-	-	-	110.00	-	-
9:8	74.26	-	65.91	68.66	71.22	70.00	78.86	74.10	62.41	69.40	77.17	67.38	61.38	67.94	76.30	72.00	78.40	-	70.31	75.00	-
47:45	96.99	-	-	-	-	-	-	84.62	95.93	-	-	89.31	108.00	-	-	-	-	-	-	-	-
48:45	55.64	-	-	-	-	-	-	50.35	56.91	-	-	51.15	63.16	-	-	-	-	-	-	-	-
52:51	74.00	-	-	-	84.62	97.22	-	83.78	85.37	-	-	78.95	84.62	86.37	-	-	-	-	-	-	-
54:55	45.10	-	-	-	48.00	-	-	47.17	46.15	-	-	48.00	41.82	51.92	-	-	-	-	-	-	-
63:62	-	-	-	-	97.62	-	-	75.86	92.86	69.81	-	76.36	-	-	-	-	-	-	-	-	-

Table 15 Individual cranial measurements

Females

MARTIN No.	16	53	60	86	99	124	125	129	131	134	136	137	167	182	186	191	207	208
	A	M	A	A	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1	171	-	162	177	-	182	179	201	-	-	-	175	178	170	169	154	-	-
1c	-	-	-	-	-	-	-	-	-	-	-	180	182	169	168	161	-	-
5	-	-	-	-	-	-	-	-	-	-	-	107	97	84	94	-	-	-
8	129	-	126	126	-	133	127	137	136	128	136	135	132	137	121	131	-	135
9	85	-	-	94	100	104	96	104	95	95	-	97	92	91	94	94	93	91
17	-	-	-	-	-	-	-	-	-	-	-	143	-	123	131	-	-	-
20	-	-	-	-	-	126	-	-	-	-	-	122	129	126	122	124	-	-
38	-	-	-	-	-	-	-	-	-	-	-	1428	1340	1207	1091	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	132	-	91	113	-	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-	-	117	117	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	93	93	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	111	-	107	107	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-	67	-	65	63	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	40	-	40	38	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	32	-	28	35	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	25	-	25	23	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	51	-	47	47	-	-	-
62	-	-	-	-	-	-	-	-	-	-	-	54	-	40	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-	40	-	42	-	-	-	-
65	-	-	-	-	-	-	-	117	-	118	-	121	-	111	113	-	105	110
66	78	94	-	-	-	-	89	99	-	91	-	96	98	95	89	-	97	97
69	25	21	-	-	-	30	28	32	25	31	-	28	29	25	24	21	19	25
70	52	49	-	-	-	67	54	60	-	67	-	62	69	46	48	-	57	60
8:1	75.44	-	77.78	71.19	-	73.08	70.95	68.16	-	-	-	77.14	74.16	80.06	71.60	85.06	-	-
17:1	-	-	-	-	-	-	-	-	-	-	-	81.71	75.84	72.35	77.51	-	-	-
17:8	-	-	-	-	-	-	-	-	-	-	-	106.00	-	89.78	108.00	-	-	-
9:8	65.89	-	-	74.60	-	78.20	75.59	75.91	69.85	74.22	-	71.85	69.70	66.42	77.69	71.76	-	67.41
47:45	-	-	-	-	-	-	-	-	-	-	-	-	-	91.45	91.45	-	-	-
48:45	-	-	-	-	-	-	-	-	-	-	-	-	-	55.56	53.81	-	-	-
52:51	-	-	-	-	-	-	-	-	-	-	-	80.00	-	70.00	111.00	-	-	-
54:55	-	-	-	-	-	-	-	-	-	-	-	49.02	-	53.19	48.97	-	-	-
63:62	-	-	-	-	-	-	-	-	-	-	-	74.07	-	105.00	-	-	-	-

Table 16

Individual measurements of the male long bones

Characteristic	17	28	29	36	47	52	55	75	80	82	84	85	87	93
	M	M	M	A	M	M	A	M	M	M	A	M	M	M
Humerus														
1 R	278	-	310	317	-	315	318	323	-	-	301	-	299	311
L	-	-	-	-	-	-	-	313	-	-	293	308	297	-
2 R	256	-	288	284	-	291	286	294	-	-	335	-	268	288
L	-	-	-	-	-	-	-	285	-	-	329	339	270	-
Radius														
1b R	-	-	223	-	-	-	-	-	-	-	257	251	221	-
L	-	-	-	-	-	-	-	230	-	-	253	257	-	-
Ulna														
1 R	-	244	-	-	-	-	-	256	-	-	273	274	240	-
L	-	243	-	-	-	-	-	-	-	-	278	-	241	-
Femur														
1 R	-	-	-	433	-	-	-	-	445	463	463	471	418	408
L	-	-	-	-	470	455	-	-	-	-	460	472	-	-
2 R	-	-	-	429	-	-	-	-	443	459	468	465	415	-
L	-	-	-	-	-	449	-	-	-	-	465	463	-	-
Tibia														
1a R	328	-	-	-	378	358	-	363	-	385	390	385	-	-
L	-	371	-	-	-	360	-	368	-	-	384	-	-	-
1b R	-	-	-	-	-	338	-	343	-	396	374	374	-	-
L	-	358	-	-	-	340	-	347	-	-	370	-	-	-
Stature														
BB	-	166.80	163.97	164.24	-	164.42	163.63	166.20	167.60	172.50	169.70	171.50	160.16	163.20
P	151.91	163.70	159.61	162.48	170.68	163.67	162.67	158.13	165.00	170.70	168.10	169.40	159.60	157.97

Table 16 (Cont. 1)

Characteristic	95	97	103	104	109	118	119	123	130	132	138	139	142
	M	M	A	A	M	M	M	M	M	M	A	M	A
Humerus													
1 R	-	-	-	-	283	-	283	328	-	330	-	343	-
L	-	-	-	278	277	-	282	324	-	328	303	-	-
2 R	-	-	-	-	255	-	311	292	-	294	-	310	-
L	-	-	-	250	250	-	308	295	-	288	337	-	-
Radius													
1b R	-	-	200	-	217	-	-	-	-	249	-	-	207
L	-	-	-	-	-	-	-	-	-	247	-	-	-
Ulna													
1 R	-	-	-	-	-	-	-	-	-	265	-	-	-
L	-	-	-	-	234	-	-	-	-	268	278	-	-
Femur													
1 R	477	401	382	411	-	497	449	451	459	443	465	485	391
L	476	-	-	-	-	-	-	453	-	441	469	-	390
2 R	475	391	373	408	-	-	446	449	-	447	468	482	396
L	475	-	-	-	-	-	-	448	-	447	465	-	395
Tibia													
1a R	-	-	-	-	-	-	369	-	-	379	390	-	-
L	-	-	-	327	332	-	365	370	-	385	-	-	-
1b R	-	-	-	-	-	-	352	-	-	371	378	-	-
L	-	-	-	339	320	-	352	358	-	378	-	-	-
Stature													
BB	172.70	160.40	157.00	162.50	155.50	176.00	163.90	166.96	169.80	168.04	170.10	172.20	158.40
P	170.89	156.69	-	155.20	149.50	174.74	-	165.41	167.60	165.71	168.70	169.50	154.22

Table 16 (Cont. 2)

Characteristic		144/A	145	146	147	148	154	155	160	161	164	173	176	179
		M	S	M	M	M	S	M	M	M	M	M	M	M
Humerus														
1	R	-	294	351	466	346	324	-	-	323	-	-	320	281
	L	344	-	349	-	342	327	-	339	321	-	347	318	285
2	R	-	273	325	466	317	298	-	-	298	-	-	295	313
	L	-	-	322	-	315	300	-	310	298	-	319	292	316
Radius														
1b	R	-	217	257	-	259	-	-	-	244	235	-	240	244
	L	-	-	259	-	-	243	-	-	259	-	-	235	245
Ulna														
1	R	-	-	-	-	280	263	-	292	-	262	-	258	267
	L	281	-	276	-	-	262	-	-	-	-	286	258	270
Femur														
1	R	474	426	504	-	481	459	414	491	460	-	471	463	470
	L	477	426	502	-	482	458	412	485	466	-	467	465	473
2	R	-	-	495	-	478	463	411	489	465	-	-	458	475
	L	-	-	494	-	478	457	410	484	461	-	-	458	477
Tibia														
1a	R	-	344	-	-	376	377	-	-	368	332	375	-	382
	L	-	-	414	-	-	376	-	-	371	330	392	-	381
1b	R	399	316	-	-	-	357	-	-	350	352	374	-	372
	L	398	-	-	394	-	354	-	-	351	352	391	-	372
Stature														
BB		-	160.50	174.80	-	172.50	167.65	162.16	172.39	168.01	163.18	172.20	167.19	167.30
P		-	158.32	174.70	-	171.10	166.04	158.98	171.44	160.54	157.31	170.12	165.89	166.20

Table 16 (Cont. 3)

Characteristic		181	183	184	185	189	199	200	201	209	212	213	217	221
		M	M	M	A	M	M	M	M	M	A	M	M	M
Humerus														
1	R	284	-	302	297	301	295	-	305	277	-	310	286	-
	L	285	-	300	292	300	295	-	299	-	-	-	285	-
2	R	318	-	336	333	344	330	-	345	314	-	344	323	-
	L	320	-	336	325	339	331	-	341	-	-	-	324	-
Radius														
1b	R	-	-	271	254	-	254	-	-	249	-	255	248	-
	L	-	-	271	258	-	254	-	-	-	-	274	-	-
Ulna														
1	R	265	-	297	-	-	281	-	-	270	-	-	-	-
	L	-	-	297	-	-	278	-	-	-	-	-	-	-
Femur														
1	R	449	-	486	479	484	-	410	486	426	-	481	449	379
	L	449	-	490	478	-	475	410	490	429	-	480	450	-
2	R	451	-	489	474	490	478	414	483	432	-	486	453	-
	L	451	-	493	474	-	472	412	488	434	-	485	455	-
Tibia														
1a	R	394	401	403	385	407	386	348	394	379	382	393	345	338
	L	393	-	401	381	404	394	-	-	379	-	394	362	-
1b	R	379	388	390	375	398	375	337	385	366	364	374	359	324
	L	378	-	385	370	394	384	-	-	378	-	376	347	-
Stature														
BB		166.60	173.00	171.40	169.80	171.40	162.10	162.10	172.00	166.40	-	171.80	167.02	160.40
P		164.40	170.90	173.40	169.90	173.50	158.00	158.00	173.20	163.70	-	170.70	162.10	154.80

Table 17 *Individual measurements of the female long bones*

Characteristic		19	53	86	92	99	110	124	125	129	131
		M	M	A	M	M	A	M	M	M	M
Humerus											
1	R	-	-	278	-	-	-	-	257	275	266
	L	-	-	-	-	-	-	-	-	-	266
2	R	-	-	309	-	-	-	-	284	304	296
	L	-	-	-	-	-	-	-	-	-	296
Radius											
1b	R	-	-	232	-	-	-	-	-	-	-
	L	-	-	233	-	-	-	-	211	220	-
Ulna											
1	R	-	-	-	-	-	-	-	232	-	-
	L	-	-	246	-	-	-	315	-	-	-
Femur											
1	R	-	-	425	420	-	402	402	382	-	409
	L	421	-	-	-	-	410	405	385	405	414
2	R	-	-	419	413	-	400	400	385	-	405
	L	-	-	-	-	-	405	404	387	409	410
Tibia											
1a	R	-	314	350	-	350	337	329	-	339	336
	L	-	-	353	-	-	332	327	319	335	-
1b	R	-	310	340	-	345	324	315	-	325	322
	L	-	-	342	-	-	324	316	306	321	-
Stature											
BB		162.00	150.00	164.00	162.10	156.20	157.50	155.30	155.70	158.30	158.20
P		-	148.20	-	160.30	160.60	156.30	152.50	147.40	151.90	151.80

Table 17 (Cont. 1)

Characteristic		134	137	159	167	182	186	191	207	208	216
		M	M	S	M	M	M	M	M	M	M
Humerus											
1	R	276	301	289	-	-	-	-	-	273	257
	L	274	294	287	322	297	-	-	-	-	-
2	R	209	326	270	-	-	-	-	-	304	286
	L	306	326	265	298	265	-	-	-	-	-
Radius											
1b	R	-	244	223	244	-	210	-	-	328	-
	L	219	-	222	237	216	-	-	-	325	-
Ulna											
1	R	239	-	243	-	-	-	-	-	-	-
	L	-	-	-	256	-	-	-	-	-	-
Femur											
1	R	426	451	417	-	410	394	409	396	424	-
	L	-	449	417	-	411	392	-	398	424	392
2	R	429	454	413	-	406	397	407	400	427	394
	L	-	453	412	-	407	396	-	402	428	-
Tibia											
1a	R	-	-	334	-	337	327	332	328	350	315
	L	-	-	335	-	338	327	-	-	-	320
1b	R	-	-	349	-	325	315	322	314	340	296
	L	-	-	354	-	324	315	-	-	-	302
Stature											
BB		160.60	164.50	158.50	164.00	157.40	156.10	156.30	154.70	159.60	154.90
P		152.30	160.20	154.70	161.00	152.20	153.50	156.90	154.40	155.20	147.40

Table 18 Results of blood group investigations

Grave No.	Sex	Age	Blood group
8	?	I/1	B
9	?	I/1	B
10	?	I/2	A
14	?	I/1	B
15	?	I/1	B
19	F	M	O
20	F	M	O
22	F	M	O
23	?	I/1	O
24	F	A	A
25	M	A	O
26	?	I/1	O
28	M	M	A
29	M	M	O
30	?	I/1	A
32	M	M	A
37	M	J	A
39	M	J	A
43	?	M	B
44	F	A	A
46	F	M	A
50	F	I/2	O
53	F	M	O
56	M	M	B
57	M	M	B
58	?	I/2	AB
68	M	J	O
75	M	M	B
80	M	M	A
82	M	M	AB
83	M	J	A
84	M	A	B
85	M	M	A
86	F	A	A
87	?	M	A
91	F	J	A
93	M	M	A
95	M	M	AB
98	F	?	A
99	F	M	A
103	?	A	A
104	M	A	O
109	M	M	A
113	F	A	O
114	M	A	O
119	?	M	A
123	M	M	B
124	F	M	O
125	F	M	O
129	F	M	A
131	F	M	O
132	F	M	A
134	F	M	O
137	F	M	O
138	M	A	A
139	M	M	AB
142	M	A	A
163	?	I/1	O
164	M	M	A
169	F	J	O
170	F	J	O
172	F	J	O
173	M	M	A
174	?	I/1	A
175	F	J	O
176	M	M	O
177	M	I/1	O
178	F	I/1	A
179	M	M	A
182	F	M	O
184	M	M	A
185	M	A	A
186	F	M	AB
187	?	I/1	A
188	F	J	A
189	M	M	A
191	F	M	A
192	?	I/1	A
193	F	I/2	A
194	?	J	A
195	M	J	A
197	M	I/2	A
198	?	I/1	O
199	M	M	A
200	M	M	B
201	M	M	A
202	F	J	A
203	M	J	O
204	?	?	AB
205	F	I/1	B
206	?	?	O
207	F	M	O
208	F	M	A
209	M	M	B
211	?	I/1	O
212	M	A	O
213	M	M	O
215	F	I/2	O
216	F	M	A
217	M	M	O
218	F	J	A
220	?	I/1	A
221	M	M	O

Table 19 Characterization of the fragmentary material

Grave No.	Characterization	Sex	Age
1	No anthropological material available.	-	-
2	No anthropological material available.	-	-
3	No anthropological material available.	-	-
4	No anthropological material available.	-	-
5	No anthropological material available.	-	-
6	No anthropological material available.	-	-
7	Skull fragments with incomplete mandible. Incomplete skeleton.	M^{+}	Mat.
8	Skull fragments with some teeth.	-	Inf. I
9	Skeletal bone fragments.	-	Inf. II
10	Skull and mandible fragments. Vertebral fragments.	-	Inf. II
11	Bone material not suitable for analysis.	-	-
12	Skull and mandible fragments. Skeletal fragments.	-	Inf. II
13	Very poorly preserved skeletal bones.	?	Ad.
14	Fragmentary skull pieces.	-	Inf. I
15	Fragmentary skull pieces.	-	Inf. I
18	Skull and mandible fragments. Incomplete, fragmentary skeletal bones.	F^{++}	Ad.
20	Fragmentary skull pieces. Only the strongly bent femora are preserved.	F	Mat.
21	Skull fragments. Torus mandibularis. Incomplete skeletal bones.	-	Inf. I
22	Skull fragments, the cranial wall is very thick.	F	Mat.
23	Skull fragments. Some vertebral pieces.	-	Inf. I
24	Cranium fragments. Os apicis. Skeletal bone fragments.	F	Ad.
26	Skull and skeletal bone fragments.	-	Inf. I
27	Cranium fragments.	?	Grown-up
30	Fragmentary skull with mandible fragments. Palatochisis. Incomplete skeletal bones.	-	Inf. I
31	Skull fragments, vertebral pieces.	-	Inf. I
32	Fragmentary skull with mandible. Very advanced radix caries of M_3. Strongly bent femora. Spondylosis dorsalis.	M	Mat.
33	Skull fragments, mandible and maxilla pieces. Incomplete skeletal bones.	(M)	Juv.
34	Skull and skeletal bones.	-	Inf. I
35	Fragmentary skull, incomplete mandible. Foramen transversarium bipartitum. Vertebral fragments.	-	Inf. I
37	Incomplete cranium. Fragmentary skeletal bones.	(M)	Juv.
38	Fragmentary skull and skeletal bones.	-	Inf. I
39	Fragmentary skull with mandible pieces.	(M)	Juv.
40	Skull and skeletal bone fragments.	-	Inf. I
41	Fragmentary cranium, mandible and maxilla pieces. Incomplete, fragmentary skeletal bones.	-	Inf. I
42	Incomplete, fragmentary skull with mandible pieces. Skeletal bone fragments.	?	Grown-up
43	Skull fragments. Clearly visible linea aspera.	M	Mat.
44	Skull fragments. Incomplete skeletal bones.	F	Ad.
45	Skull fragments. Fragmentary skeletal bones.	-	Inf. II
48	Cranium fragments.	F	Mat.
49	Fragmentary skeletal bones, definite muscle insertion surfaces on long bones.	M	Mat.
50	Fragmentary skull. Torus mandibularis. Fragmentary skeletal bones.	-	Inf. I
51	Skull and skeletal bone fragments.	-	Inf. I
54	Skull and skeletal bone fragments.	-	Inf. II

Table 19 (Cont. 1)

Grave No.	Characterization	Sex	Age
56	Incomplete, fragmentary skull. Incomplete skeletal bones. A large-scale abrasion of molars.	M	Mat.
57	Fragmentary skull. Incomplete, fragmentary skeletal bones, definite muscle insertion surfaces on long bones.	M	Mat.
58	Incomplete skull. Torus mandibularis. Os apicis. Vertebral fragments.	-	Inf. II
59	Fragmentary skull and skeletal bones.	-	Inf. II
62	Fragmentary skull and skeletal bones.	-	Juv.
63	Fragmentary skull with mandible. Torus mandibularis. Not measurable, fragmentary skeletal bones.	M	Ad.
64	No anthropological material available.	-	-
65	Skull and skeletal fragments.	-	Inf. I
66	Cranium fragments.	-	Inf. I
67	Skull fragments, incomplete skeletal bones.	-	Inf. I
68	Incomplete skull with mandible. Torus mandibularis.	(M)	Juv.
69	Skull fragments. Fragmentary, incomplete skeletal bones. Schmollhernia.	(M)	Juv.
70	Some tooth fragments.	-	Inf. I
71a	Skull remains, several teeth.	-	Inf. I
71b	Skull remains.	-	Inf. I
72	Fragmentary skull, markedly deformed post mortem. Skeletal remains.	F	Mat.
73	Skull with incomplete mandible. Torus mandibularis. Fragmentary skeletal bones.	(F)	Juv.
74	Fragmentary skull, badly preserved skeletal bones.	M	Ad.
76	Fragmentary skull and skeletal bones.	-	Inf. I
77	Fragmentary skull and skeletal bones.	-	Inf. I
78	Skull fragments, skeletal remains.	M	Mat.
79	Skull fragments with mandible. Torus mandibularis. Incomplete skeletal bones.	M	Mat.
81	Incomplete skull with fragmentary mandible. Incomplete skeletal bones.	M	Mat.
83	Skull fragments, teeth.	(M)	Juv.
88	Fragmentary skull, torus mandibularis. Several cervical vertebrae.	-	Inf. I
89	Several tooth.	-	Inf. I
90	Fragmentary skull and skeletal bones.	-	Inf. I
91	Relatively well preserved skull. Sutura metopica. Incomplete skeletal bones. Caudal sacrum bifidum.	(F)	Juv.
94	Fragmentary skull pieces, mandible. Fragmentary, incomplete skeletal bones.	M	Mat.
96	Incomplete, fragmentary skull with mandible. Fragmentary skeletal bones.	F	Mat.
98	Fragmentary skull and skeletal bones.	F	Grown-up
100	Fragmentary skull with mandible fragment. Incomplete skeletal bone.	M	Mat.
101	Fragmentary skull and skeletal bones.	-	Inf. I
102	Skull and skeletal bones.	-	Inf. II
105	Skull and skeletal bones. Dual dens epistropheus.	-	Inf. II
106	Fragmentary skeletal bones. Relatively well preserved skeletal bones.	-	Inf. I
107	Fragmentary skull and skeletal bones.	-	Inf. I
108	Fragmentary skull and skeletal bones.	-	Inf. I
111	Skull and skeletal bone fragments.	-	Inf. I

Table 19 (Cont. 2)

Grave No.	Characterization	Sex	Age
112	Skeletal bone fragments.	-	Inf. I
113	Skull and skeletal bone fragments.	F	Ad.
114	Fragmentary skull. Incomplete skeletal bones. Foramen transversarium bipartitum.	M	Ad.
115	Skull and skeletal bone remains.	-	Inf. I
116	Teeth. Skeletal bone remains.	-	Juv.
117	Vertebrae and rib remains.	F	Ad.
120	Relatively well preserved skull and skeletal bones.	M	Mat.
121	Skull and skeletal bones.	-	Inf. II
122	Incomplete, fragmentary skull. Foramen transversarium bipartitum. Incomplete skeletal bones. Spondylosis on cervical vertebrae.	M	Mat.
126	Skull and skeletal bone remains.	-	Inf. II
127	Incomplete skeletal bones.	?	Ad.
128	Mixed material.	-	-
133	No anthropological material available.	-	-
140	Fragmentary skull with mandible. Incomplete skeletal bones.	(F)	Juv.
141	Fragmentary mandible. Skeletal bone remains.	?	Grown-up
143	Skeletal bone fragments. Spina bifida L_5S_1.	F	Ad.
144b	Maxilla, mandible. Very advanced caries of molars.	-	Juv.
144c	Mandible. Skeletal bone remains. Bent femora.	-	Inf. II
149	Skull fragments. Early ossification of temporal bone.	-	Inf. I
150	Brain case. Occiput obtained a conical shape as a result of circular drafting. Beside this there is a post mortem flattening in a lateral direction on the skull as well. Foramen transversarium bipartitum. Skeletal bone fragments. S_1 lumbalization.	-	Inf. II
151	Skull from the Roman period.		
152	Skull fragments with mandible. Os apicis. Incomplete, fragmentary skeletal bones. Exostoses on the foramen transversarium of vertebrae C_3 and C_4.	-	Juv.
153	Incomplete skull. Fragmentary skeletal bones. Lumbalization S_1. Extremely tapered foramen transversarium.	-	Inf. II
156	Fragmentary skull with mandible. Incomplete skeletal bones. Foramen transversarium bipartitum.	(F)	Juv.
157	Tarsal and metatarsal bones.	?	Grown-up
158	Empty grave.	-	-
162	Fragmentary brain case. Os apicis. Right side os epiptericum. Wormiana bone in sutura lambdoidea. Cribra orbitalia on both sides.	M	Ad.
163	Skull fragments, incomplete skeletal bones. Foramen transversarium bipartitum.	-	Inf. (I ?)
165	Empty grave.	-	-
166	Fragmentary skull with mandible. Skeletal bone pieces.	-	Inf. II
168	Tarsal, metatarsal bones, phalanges.	?	Grown-up
169	Fragmentary skull and skeletal bones. Spondylosis.	(F)	Juv.
170	Fragmentary, incomplete skull. Wormiana bones in sutura sagittalis and in the right side of sutura lambdoidea. Fragmentary skeletal bones.	(F)	Juv.
171	Fragmentary skull with mandible. Skeletal bone fragments. The left side of the occipital region of the cranium is flattened - probably post mortem. Wormiana bones in both sides of sutura lambdoidea.	-	Inf. II
172	Skull with incomplete base, mandible. Right side os epiptericum. Foramen transversarium bipartitum.	(F)	Juv.
174	Fragmentary skull with mandible fragments. Skeletal bone remains	-	Inf. I
175	Hardly incomplete skull. Incomplete skeletal bones.	(F)	Juv.

Table 19 (Cont. 3)

Grave No.	Characterization	Sex	Age
177	Skull fragments, several teeth. Only some diaphysis fragments remained from the skeletal bones.	-	Inf. I
178	Fragmentary brain case. Maxilla and mandible fragments. Skeletal bone fragments. Foramen transversarium bipartitum.	-	Inf. I
180	Empty grave.	-	-
187	Skull fragments. Some tooth germs in the mandible.	-	Inf. I
188	Well preserved skull. Sutura metopica. Wormiana bones in sutura sagittalis and in both sides of sutura lambdoidea. Flatness in obelion-lambda region, conical occiput. Incomplete skeletal bones.	(F)	Juv.
190	Empty grave.	-	-
192	Mandible. Incomplete, fragmentary skeletal bones.	-	Inf. I
193	Skull and skeletal bone fragments. Vertebral arches.	-	Inf. II
194	Skeletal bones.	-	Juv.
195	Fragmentary skull and skeletal bones.	(M)	Juv.
196	Empty grave.	-	-
197	Fragmentary skull. Skeletal bone remains.	-	Inf. II
198	Skull and skeletal bone fragments.	-	Inf. I
202	Fragmentary skull with mandible. Incomplete skeletal bones.	(F)	Juv.
203	Well preserved skull. Os apicis. Incomplete skeletal bones.	(M)	Juv.
204	Metatarsal bones.	?	Grown-up
205	Fragmentary skull and skeletal bones. Double dens epistrophei.	-	Inf. I
206	Patellae, phalanges, vertebrae.	?	Grown-up
210	Fragmentary skull with mandible. Skeletal bone fragments.	-	Inf. I
211	Skeletal bone remains, some tooth germs.	-	Inf. I
214	Incomplete cranium, deformed post mortem. Sutura metopica. Badly preserved skeletal bones.	(F)	Juv.
215	Incomplete skull with fragmentary mandible. Os apicis. Skeletal fragments.	-	Inf. II
216	Fragmentary, incomplete skull. Incomplete skeletal bones.	F	Mat.
218	Fragmentary, incomplete skull, slightly incomplete mandible. Skeletal bone remains.	(F)	Juv.
219	Mandible. Skeletal bone fragments.	-	Inf. II
220	Mandible and some deciduous teeth.	-	Inf. I

+M Male

++F Female

Sequence of the compared series (Figs 1-12)

1. Pusztapáka (Kiskunfélegyháza), 11th c.
(ALLODIATORIS 1937)
2. Fiad-Kérpuszta, 11th c.
(NEMESKÉRI et al. 1953, TÓTH 1973)
3. Veszprém-Kálváriadomb, 10-11th c.
(ACSÁDI-NEMESKÉRI 1957)
4. Cegléd, 11-12th c.
(LIPTÁK 1957)
5. Jászdózsa-Kápolnahalom, 11-14th c.
(LIPTÁK 1957)
6. Zenta-Paphalom, 14-15th c.
(BARTUCZ-FARKAS 1958, TÓTH 1973)
7. Székesfehérvár-Bikasziget, 10-11th c.
(ACSÁDI-NEMESKÉRI 1959, TÓTH 1973)
8. Gáva-Vásártér, 11th c.
(NEMESKÉRI et al. 1961)
9. Orosháza, Rákóczitelep, 10-12th c.
(LIPTÁK-FARKAS 1962)
10. Fonyód, 13-16th c.
(DEZSŐ et al., 1963)
11. Téglás-Angolkert, 11-14th c.
(LIPTÁK-MARCSIK 1965, TÓTH 1973)
12. Békés-Povádzug, 10-12th c.
(LIPTÁK-FARKAS 1967a, TÓTH 1973)
13. Szatymaz-Vasutállomás, 10-12th c.
(LIPTÁK-FARKAS 1967b, TÓTH 1973)
14. Aldebrő-Mocsáros, 10-11th c.
(MARCSIK 1967)
15. Sárbogárd, 10th c.
(ÉRY 1968)
16. Kardoskút-Fehértó, 11-12th c.
(MARCSIK 1970, TÓTH 1973)
17. Kál, 10th c.
(ÉRY, 1970)
18. Helemba-Sziget, 13-17th c.
(WENGER 1971, TÓTH 1973)
19. Tengelic, 10th c.
(ÉRY 1971)
20. Oroszvár, 10-11th c.
(BOTTYÁN 1972)
21. Nagytálya, 13-16th c.
(KOROMPAI 1974)
22. Tiszalök-Rázompuszta, 11th c.
(LOTTERHOF 1974)
23. A group, 10th c.
(ÉRY 1978)
24. B group, 10th c.
(ÉRY 1978)
25. C group, 10th c.
(ÉRY 1978)
26. D group, 10th c.
(ÉRY 1978)
27. Esztergom-Vasútállomás, 11-12th c.
(PAP 1979a)
28. Nagykőrös, 11-13th c.
(PAP 1979b)
29. Taliándörögd, 12-13th c.
(ÉRY 1979)
30. Szabolcs-Petőfi utca, 10-12th c.
(PAP 1981)
31. Visegrád, 11-12th c.

Sequence of compared series (Figs 13-20)

1. Europoids
2. Mongoloids
3. Conquering Hungarians
4. Helemba-Sziget, 13-17th c.
5. Oroszvár, 10-11th c.
6. Nagykőrös, 11-13th c.
7. Esztergom-Vasútállomás, 11-12th c.
8. Szabolcs-Petőfi utca, 10-12th c.
9. Visegrád, 11-12th c.

Sequence of compared series (Fig. 21)

1. Europoids, Medieval Epoch, North Region SU
   (DEBETS 1961)
2. Europoids, Medieval Epoch, South Region SU
   (DEBETS 1961)
3. Europo-mongoloids, Medieval Epoch, North Region SU
   (DEBETS 1961)
4. Mongoloids, Medieval Epoch, SU
   (DEBETS 1961)
5. Conquering Hungarians
   (DEBETS 1964, TÓTH 1965, 1969)
6. Fiad-Kérpuszta, 11th c.
   (NEMESKÉRI et al. 1953, TÓTH 1958, 1973)
7. Orosháza-Rákóczitelep, 11-12th c.
   (LIPTÁK-FARKAS 1962, TÓTH 1958, 1973
8. Helemba-Sziget, 13-17th c.
   (WENGER 1971, TÓTH 1973)
9. Fonyód, 13-16th c.
   (DEZSŐ et al. 1963, TÓTH 1973)
10. Nagykőrös, 11-13th c.
    (PAP 1979b)
11. Esztergom-Vasútállomás, 11-12th c.
    (PAP 1979a)
12. Szabolcs-Petőfi utca, 10-12th c.
    (PAP 1981)
13. Visegrád, 11-12th c.

Figs 1-4 Comparison of male series

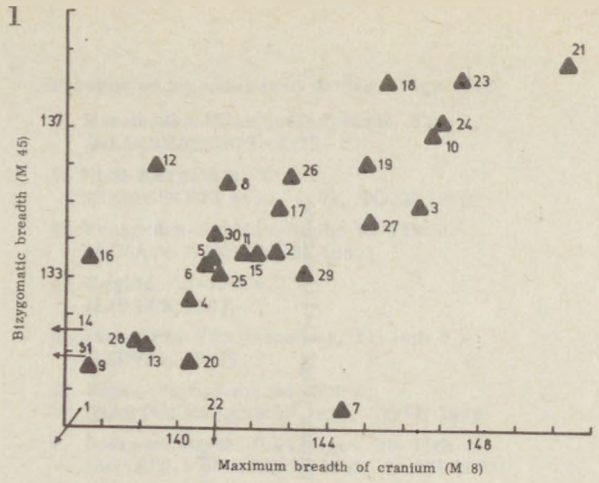
Figs 5-8 Comparison of female series

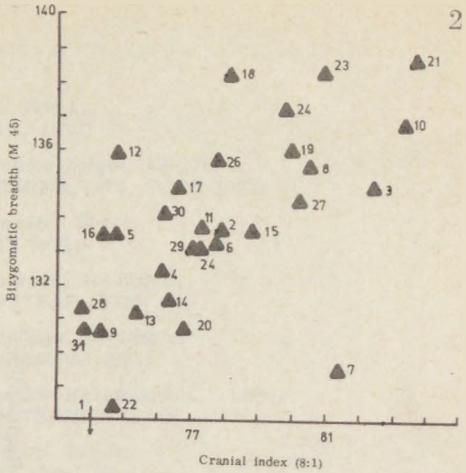
Figs 9-12 Correlation of male (Figs 9-10) and female (Figs 11-12) series

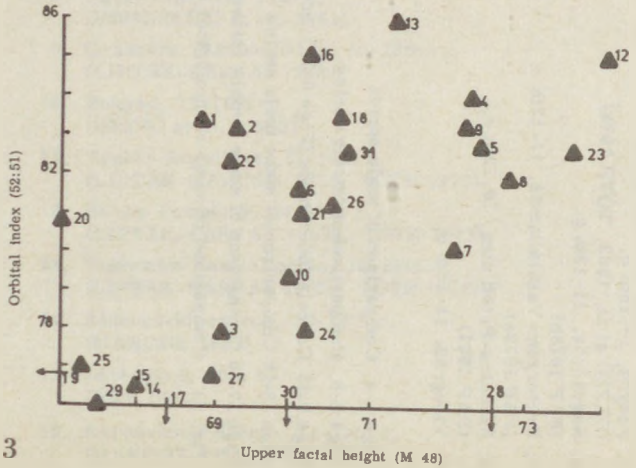
Figs 13-16 Comparison of some male series

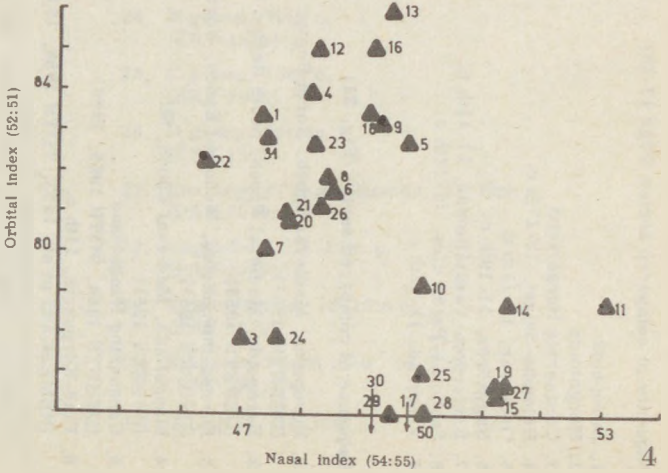
Figs 17-20 Comparison of some female series

Fig. 21 Comparison of some craniological series


1
Bizygomatic breadth (M 45)
137
133
140
144
148
Maximum breadth of cranium (M 8)


2
Bizygomatic breadth (M 45)
140
136
132
77
81
Cranial index (8:1)


3
Orbital index (52:51)
86
82
78
69
71
73
Upper facial height (M 48)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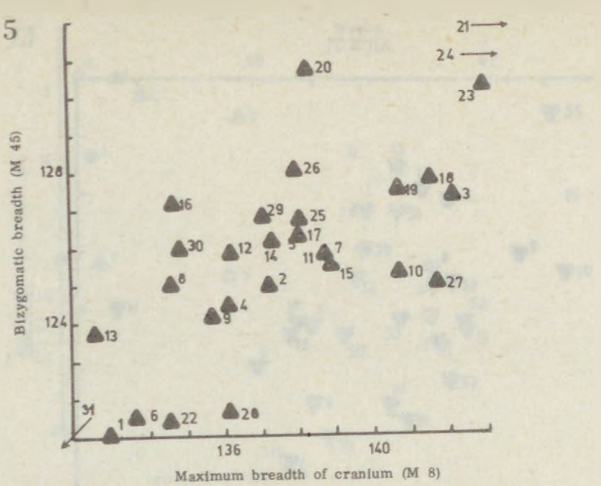
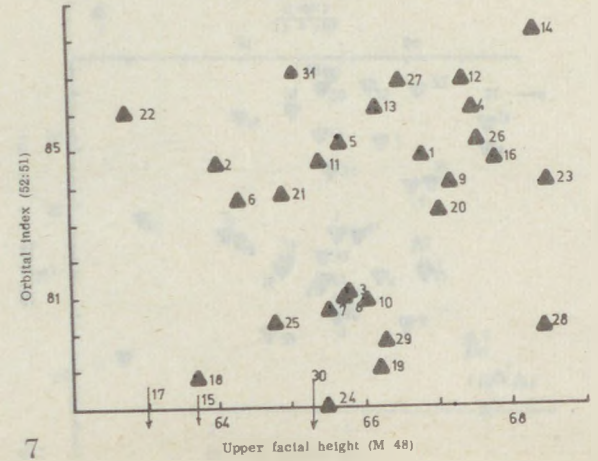
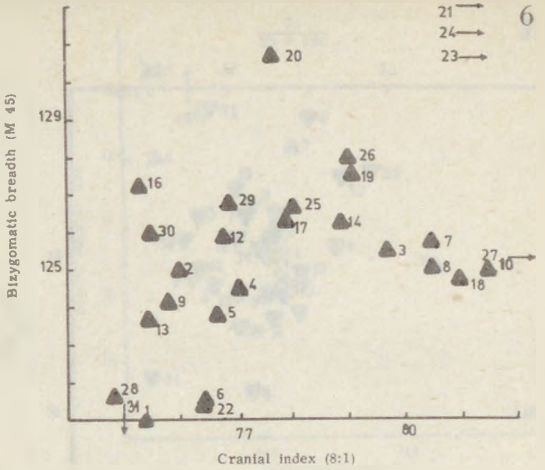
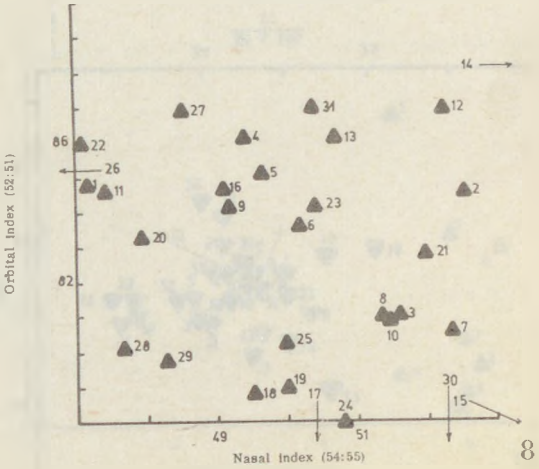
Orbital index (52:51)
84
80
47
50
53
Nasal index (54:55)

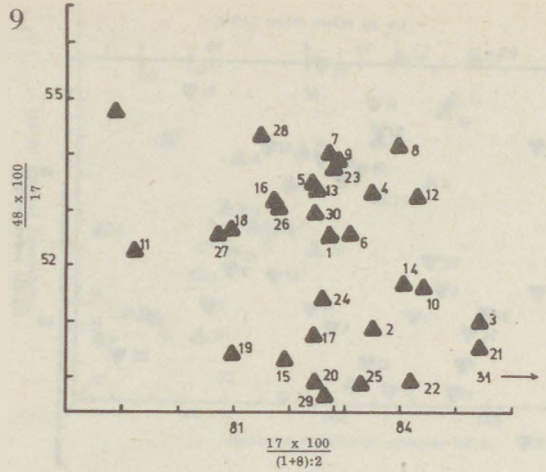

5
Bizygomatic breadth (M 45)
128
124
136
140
Maximum breadth of cranium (M 8)
21
24
23


7
Orbital index (52:51)
85
81
64
66
68
Upper facial height (M 48)

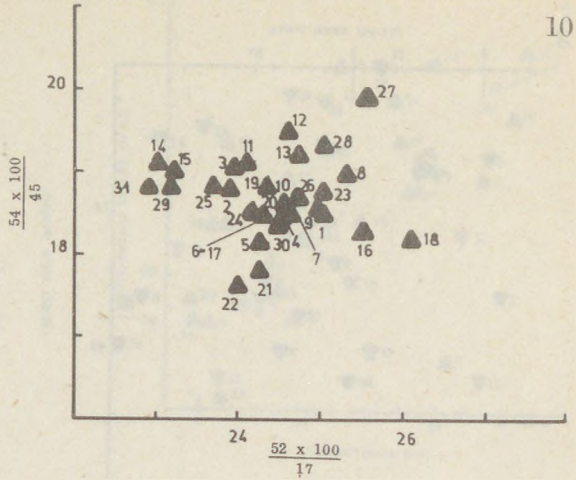

6
Bizygomatic breadth (M 45)
129
125
77
80
Cranial index (8:1)
21
24
23

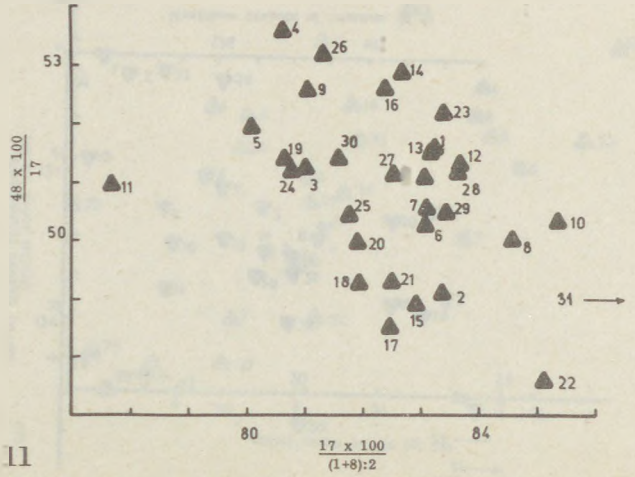

8
Orbital index (52:51)
86
82
49
51
Nasal index (54:55)
14

9

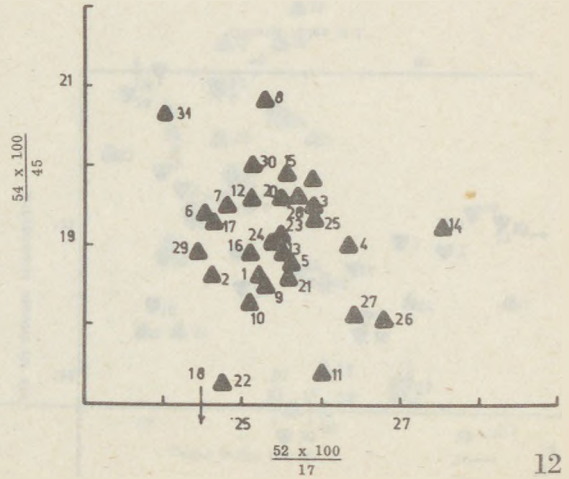

48 x 100 / 17
55
52
81
84
17 x 100 / (1+8):2

10


54 x 100 / 45
20
18
24
26
52 x 100 / 17

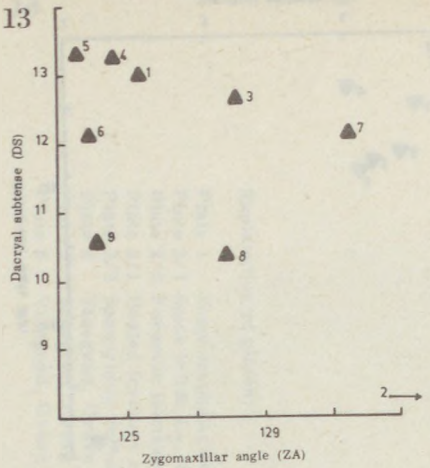

48 x 100 / 17
53
50
80
84
17 x 100 / (1+8):2

11

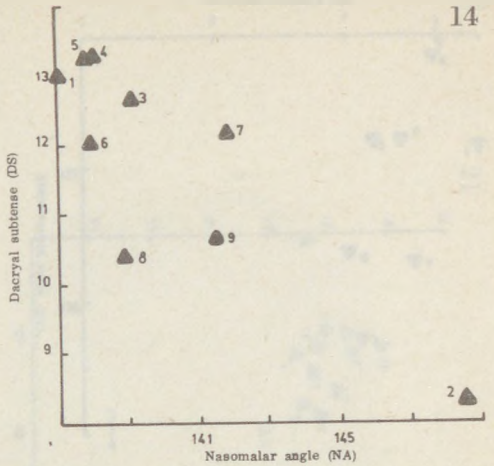

54 x 100 / 45
21
19
25
27
52 x 100 / 17

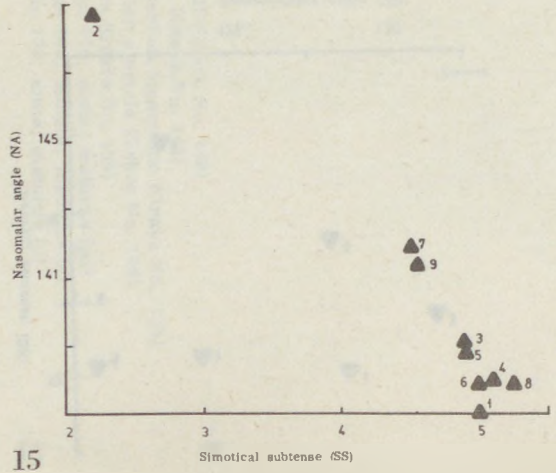
12

13

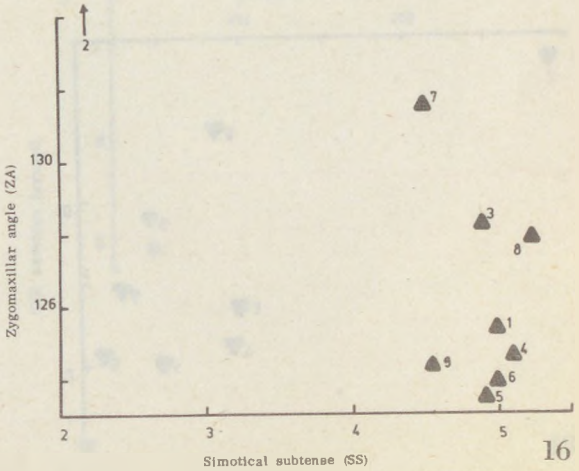

Dacryal subtense (DS)
13
12
11
10
9
125
129
Zygomaxillar angle (ZA)
5
4
1
3
7
6
9
8
2

14


Dacryal subtense (DS)
13
12
11
10
9
141
145
Nasomalar angle (NA)
5
4
1
3
7
6
9
8
2

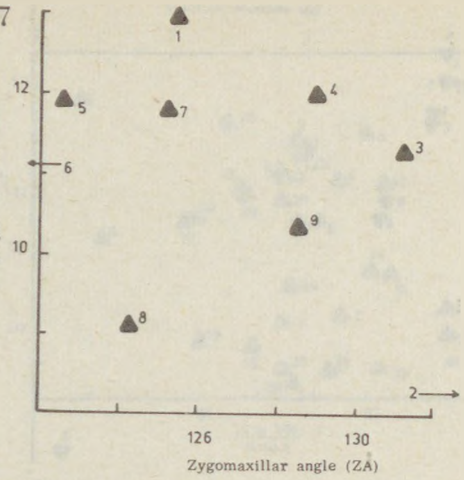

Nasomalar angle (NA)
145
141
2
3
4
5
Simotical subtense (SS)
2
7
9
3
5
4
6
8
1

15


Zygomaxillar angle (ZA)
130
126
2
3
4
5
Simotical subtense (SS)
2
7
3
8
1
4
9
6
5

16

17



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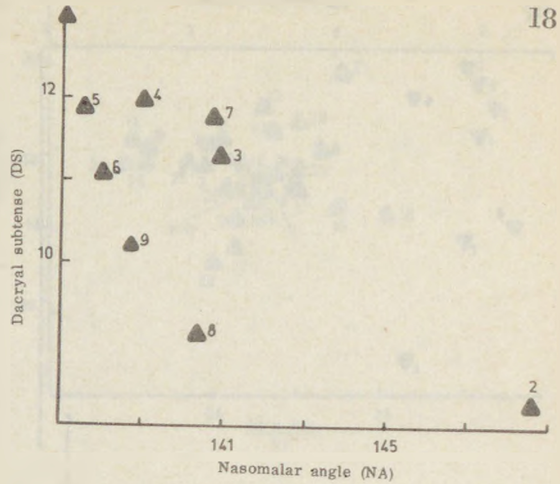

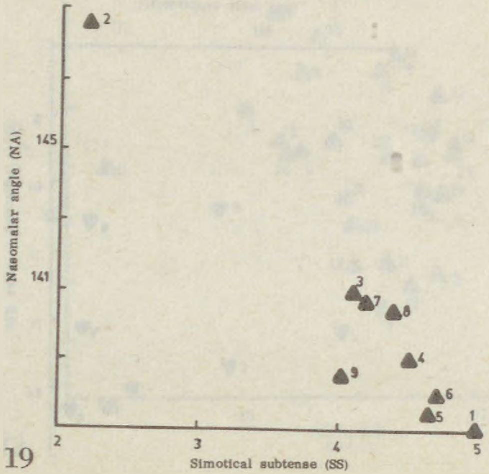

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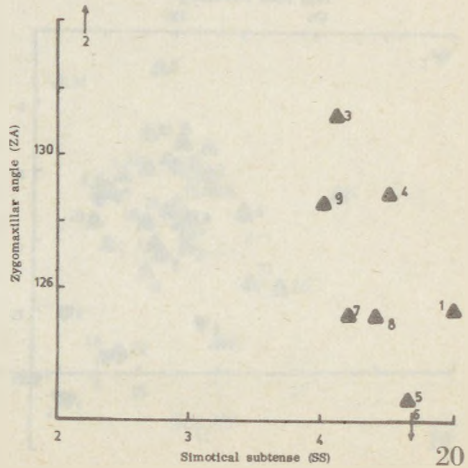

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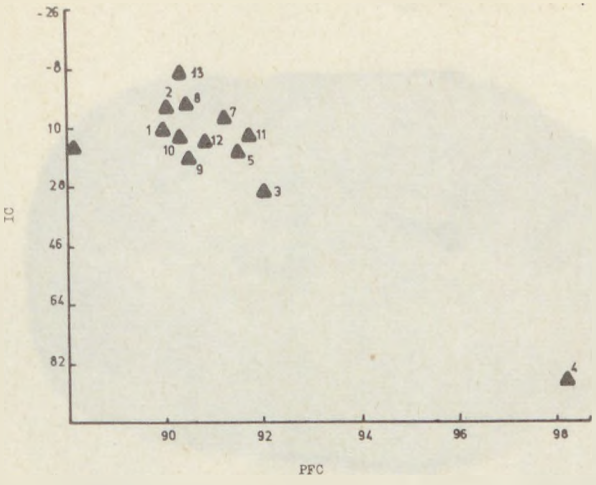
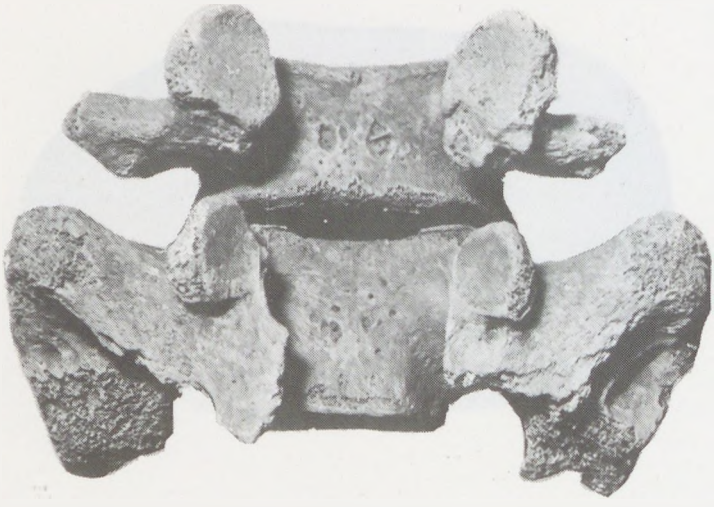


Explanation of plates:

Plate 1 Scaphocephalic skull (Grave No. 146)
Plate 2/1 Spina bifida L_5, S_1 (Grave No. 143)
Plate 2/2 Foramen transversarium bipartitum (Grave No. 154)
Plate 3/1 Healed fracture of left clavicle (Grave No. 146)
Plate 3/2 Spondylotic vertebra (Grave No. 159)
Plate 4 Visegrád, Grave No. 176, male, maturus (pn)
Plate 5 Visegrád, Grave No. 186, female, maturus (n)
Plate 6 Visegrád, Grave No. 179, male, maturus (p)

Plate 1

Plate 2



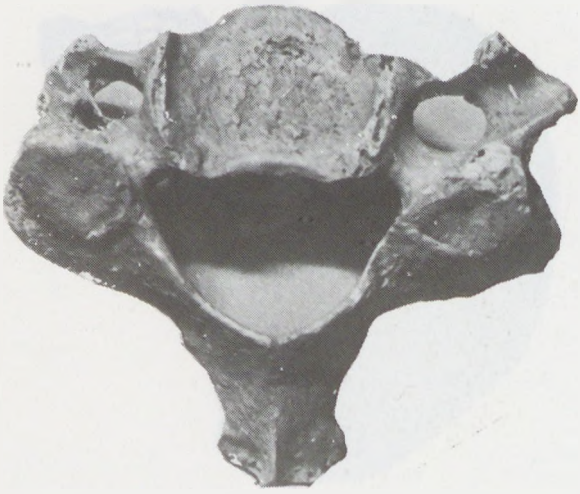


Plate 3

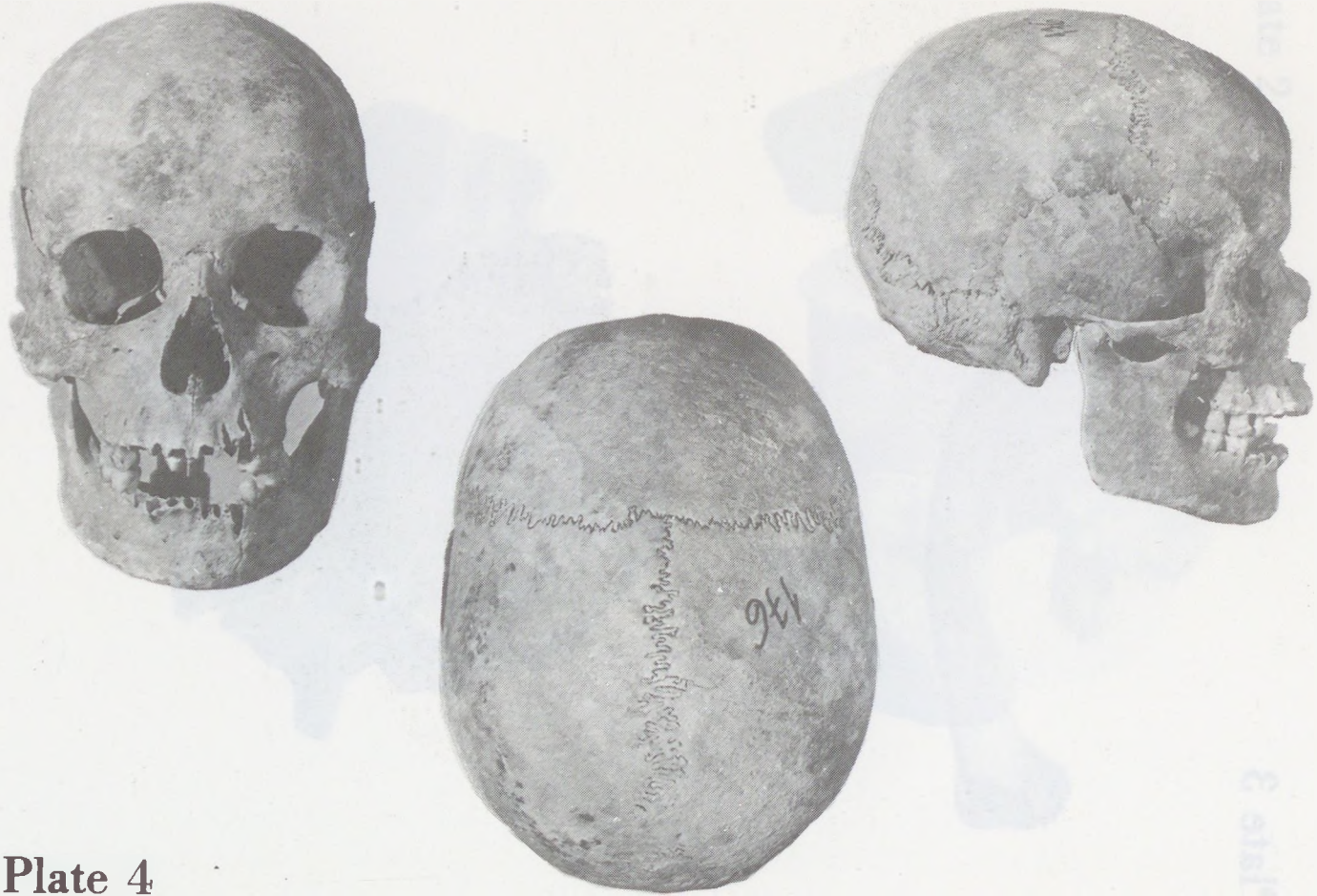
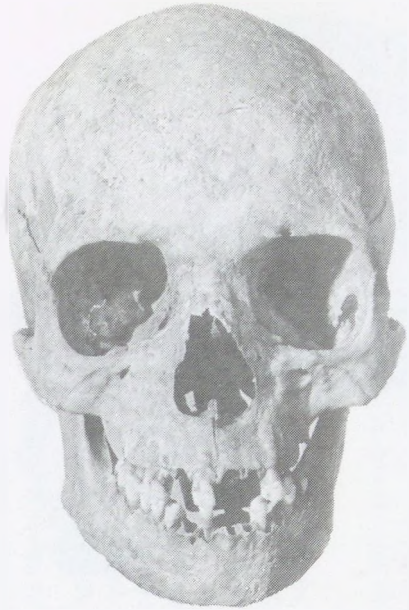


Plate 4



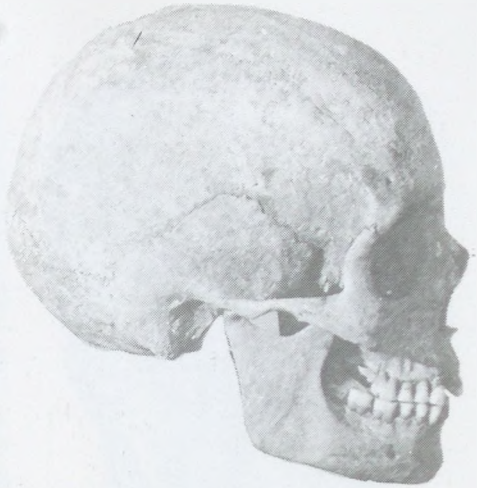


Plate 5

Plate 6

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