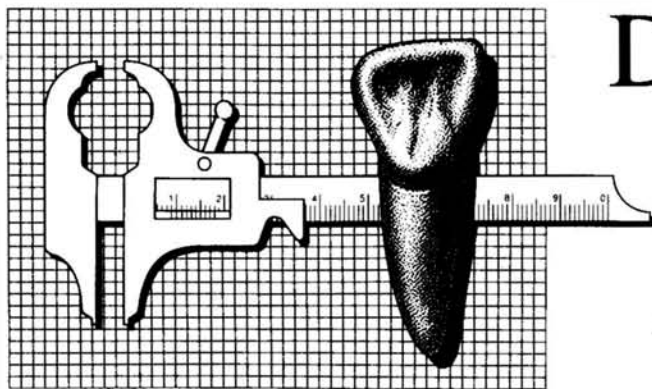


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Directions in Dental Anthropological Research in Hungary, with Historical Retrospect

FERENC KÓSA

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BRIEF HISTORY OF ANTHROPOLOGY

Anthropology as a science began to develop rapidly in Hungary during the middle and latter part of the 19th century. The Eighth World Congress of Prehistory and Anthropology, held in Budapest in 1876, stimulated this development. The congress aroused the interest of many individuals working in different fields of anthropology, most notably S. Scheiber, the anthropologist (Scheiber, 1873); F. Römer, the archaeologist (Eiben, 1988); and J. Lenhossék, the anatomist (Lenhossék, 1875).

The intellectual endeavors of scientists, together with changes in international relations, resulted in the establishment of the Department of Anthropology at Péter Pázmány University of Natural Sciences in Budapest in 1881. Aurél Török (1842-1912) was the first university professor in the department. Previously, he had worked in the Department of Forensic Medicine, Pathology, Anatomy, and Physiology of the Medical Academy in Kolozsvár. Török had obtained much of his knowledge during trips abroad (Paris), where he studied human anatomy and biology. Thus, his published works deal with paleopathology and the study of the human skull (Török, 1882, 1890, 1898, and 1899).

EARLY ANTHROPOLOGISTS

Between World Wars I and II, M. Lenhossék (1836-1937) investigated hominid evolution and paleoanthropology (Lenhossék, 1915, 1917, 1917a, 1918, 1919, 1920, 1921, and 1922). After 1940, L. Bartucz (1885-1966), who had been a professor at the Institute of Anthropology in Budapest since 1931, directed the Institute of Anthropology in Szeged. To improve the teaching of anthropology at the university, Bartucz distributed lecture notes about topics of anthropology and human evolution. Bartucz' (1914, 1935, and 1966) publications stand out in the field of paleoanthropology, and the data in his 1966 monograph on prehistoric trepanation are especially noteworthy.

M. Malán (1900-1968) was another important anthropologist of this century. He organized a modern Institute of Anthropology and established anthropological education and research at the University in Kolozsvár. (Kolozsvár in Transylvania had been reannexed to Hungary). Later, Malán directed the Institute of Anthropology in Budapest, after the retirement of Bartucz.

J. Nemeskéri (1914-1990), a student of Bartucz, was lecturer and non-staff teacher at the University in Debrecen. He was also director of the Demographic Research Institute of the Central Statistical Office. In 1959, Nemeskéri contributed to the success of the symposium, "Anthropological Questions of the Carpathian Basin", held in Budapest. A similar symposium, "Evolutionary Trends in Fossil Hominids" was held in 1967 in Budapest and Eger. Seven years later in 1974, two international series of lectures were given: "The Question of Age and Sex Determination" in Budapest and "Paleodemography" in Sárospatak. His major publications are Nemeskéri (1943, 1947; Nemeskéri and Harsányi, 1968; Nemeskéri and Dezső, 1969; and Nemeskéri, Harsányi, and Acsadi, 1960).

UNIVERSITIES AND MUSEUMS

The scientific activities of anthropologists in the departments of anthropology in the three universities and the larger museums were noteworthy. In 1975, D.G. Eiben took over as director of the Institute of Anthropology in Budapest. On the basis of his position and activities, he is considered the directing personality of anthropology in Hungary. His research has been directed mainly toward physical anthropology, biology, and human ecology (Eiben, 1982, 1988).

Meanwhile, P. Lipták succeeded Bartucz as director of the Department of Anthropology of Attila József University of Science (JATE) in Szeged. His interests have focused on anthropological taxonomy and paleoanthropology (Lipták, 1967, 1969, 1976). In 1969 Lipták published, *Anthropology and Human Evolution*, the first anthropology textbook printed in Hungary. Another of his books, *Avars and Ancient Hungarians* (Lipták, 1983), deals with the origin of the Hungarian People on the basis of osteological discoveries and evidence from linguistics, archaeology, ethnography, and other prehistoric information.

Gy. Farkas has directed the Department of Anthropology in Szeged since 1980. His scientific work is aimed at investigation of prehistoric skeletal material in the southwestern part of the Hungarian plain in order to obtain data on growth, maturation, and acceleration rate of juveniles (Farkas, 1969, 1972; Farkas and Marcsik, 1975, 1979).

I. Lengyel (1970-1992) gave special lectures on results of paleo-serological studies, which he carried out at the Department of Anthropology in Szeged and later in Budapest. These results have been described in a monograph *Paleoserology, Blood Typing with the Fluorescent Antibody Method* (Lengyel, 1975).

DENTAL ANTHROPOLOGY

Dental anthropology is not completely isolated from the science of anthropology, yet to some extent it is an independent unit. In Hungary dental anthropology encompasses three specialties: anthropology, stomatology (dentistry), and forensic anthropology (forensic osteology and stomata-odontology). Nearly all researchers dealing with anthropology are interested in dental anthropology. Evidence can be found in Kocsis' (1989) literature review and bibliography, which contains 172 citations of publications about maxillary and mandibular morphology, dental morphology, mandibular pathology, dental morphological feature, dental caries, tooth wear, periodontal lesions and periapical changes, illness and dental development, and pseudopathological deformations from data from Hungarian excavations.

Research Cited in Kocsis (1989)

Publications on maxillary and mandibular morphology discussed in Kocsis' review (1989) are works by Apor (1943), Balogh and Csiba (1966), L. Botyán (1968, 1970a, 1970b, 1971, 1973, 1974a, 1974b, 1975), Dobrovits (1966), Dobrovits and Kemény (1971), Farkas and Marcsik (1979), Finnegan and Marcsik (1979, 1980), Földes et al., (1981), Kollár (1948), Könegyi and Marcsik (1976), Lang (1955), Lenhossék (1915, 1917a, 1917b, 1918, 1919, 1920, 1921, 1922), Nitsche and Vályi (1958), Prágai (1982), Prágai and Fazekas (1982, 1983), Regöly-Mérei and Nemeskéri (1958a, 1958b), Rudas (1989a, 1989b), Simon and Kömives (1937), Somogyi (1953), Szabó and Doby (1972), Szokolóczy-Sillaba (1937, 1939, 1953), Tamás (1986), and Török (1882, 1890, 1898, 1899).

Publications on pathology are those by Berndorfer (1962), Jójárt (1988), Kemenes (1970), Marcsik (1976, 1983), Marcsik and Kocsis (1985), Nemeskéri (1943, 1947), Nemeskéri and Harsányi (1968, 1969), Regöly-Mérei and Nemeskéri (1958a, 1958b), Somogyi (1953), and Schranz (1953). Works on dental morphological structures are those by Alaodioris (1937), Bartucz (1914, 1935, 1966), Hillebrand (1908a, 1908b, 1909), Iszlay (1881a, 1881b), Lenhossék (1915, 1917a, 1917b, 1918, 1919, 1920, 1921, 1922), Malán (1944, 1955, 1961), Molnár and Huszár (1953), Salamon (1923, 1938, 1940a, 1940b, 1941, 1942), Schranz (1953, 1956, 1962, 1964, 1967, 1988), Schranz and Huszár (1954, 1955, 1958, 1962), Szabó (1934, 1935), Thoma (1963, 1966, 1967), and Török (1882, 1890, 1898, 1899). Works on dental caries have been published by Brabant (1962, 1971), Brabant and Nemeskéri (1963), Bruszt (1950a, 1950b, 1950c, 1952, 1953a, 1953b, 1954, 1958, 1963, 1966, 1975), Bruszt and Könegyi (1963), Endrész (1986), Éry (1971, 1981, 1982), Hillebrand (1908a), Huszár (1945, 1951, 1961, 1963, 1965, 1966, 1967, 1968, 1972, 1974a, 1974b, 1976), Huszár and Schranz (1952), Kiszely (1966), Kollár (1948), Lenhossék (1919), Schranz (1956, 1962, 1964, 1964, 1988), Schranz and Huszár (1954, 1955, 1958, 1962), Szikáry and Huszár (1933), Tóth (1966a, 1966b, 1966c, 1967a, 1967b, 1967c, 1967d, 1968, 1970a, 1970b), and Tóth and Sonkodi (1972).

Works on the cultural history of dental wear are those by Huszár and Schranz (1954), Mathé and Molnár (1940), Molnár (1939), and Schranz and Huszár (1954, 1955). Works on periodontal lesions and periapical changes have been written by Pap (1986) and Szarvas (1981). Publications on disease and developmental anomalies are those by Arkövy (1904a, 1904b), Hajós (1989), Kocsis (1989), Kocsis and Marcsik (1979, 1980, 1981, 1982, 1983a, 1983b, 1987, 1989, 1991), Kocsis and Mari (1988), Kocsis and Trogmyer (1986), Kocsis, Marcsik, and Mann (1992), and Salamon (1923, 1938, 1940a, 1940b, 1941, 1942).

Work by Dentists

Dentists (stomatologists), who are experts at dental anthropology, have worked at four Hungarian medical universities and three dental clinics. D. Schranz, Gy Huszár, and G. Szabó have worked at the Dental Clinic of Semmelweis Medical University. Previously, P. Adler and A. Szentpéteri worked at the Stomatological Clinic of the Medical University in Debrecen. D. Hattasy, S. Pónyi, K. Tóth, and G. Prági have worked at the Dental Clinic of Albert Szent-Györgyi Medical University in Szeged. Presently, A. Mari, A. Fazekas, and G.S. Kocsis work there. Publications include those by Schranz (1953, 1956, 1957, 1962, 1988); Schranz and Huszár (1954, 1955, 1958, 1962), Pónyi and Nyilasi (1971) Pónyi and Szabó (1989), Tóth (1966a, 1966b, 1966c, 1967a, 1967b, 1967c, 1967d, 1968, 1970a, 1970b, 1980/81), Tóth and Sonkodi (1972), Kocsis (1988, 1989), Kocsis and Marcsik (1979, 1980, 1981, 1982, 1983a, 1983b, 1987, 1989, 1991), Kocsis and Mari (1988), Kocsis and Trogmyer (1986), and Kocsis, Marcsik, and Mann (1992).

The work of these individuals focuses on archaeological dental discoveries in addition to modern dental medicine. Schranz has actively pursued projects of identification of individuals through teeth (Schranz, 1953), prehistoric investigation of paradentosis (Schranz, 1962), evaluation of dental wear by dental and culture-historical use of fossil teeth, and dental disease and the appearance of caries in prehistoric peoples (Schranz, 1856, 1964, 1988; Schranz and Huszár, 1954, 1955, 1958, 1962).

K. Tóth has worked on similar projects. His observations on archaeological skeletal materials led to his study of connections between civilization, dental caries, and origins and results of dental pathology. He has also investigated the frequency of caries during the seventh to the thirteenth centuries AD (Tóth, 1966a, 1966b, 1966c, 1967a, 1967b, 1967c, 1967d, 1968, 1970a, 1970b, 1980/81; Tóth and Sonkodi, 1972).

G.S. Kocsis was a student of Tóth at the Medical University in Szeged. He continues to study archaeological skeletal materials. (Kocsis, 1988; Kocsis and Marcsik, 1979, 1980, 1981, 1982, 1983a, 1983b, 1987, 1989; Kocsis and Mari, 1988; Kocsis and Trogmyer, 1986; Kocsis, Marcsik, and Mann, 1992; Marcsik, 1989; Marcsik and Kocsis, 1984, 1985 1986; and Marcsik, Kósa, and Kurucz, 1984).

In addition to these publications, some important studies in clinical dentistry must be mentioned. For example Vajdovich and Dinnyés (1989) have enhanced our knowledge of anatomical and typographic relationships of the mandible through a study which corrected earlier information about the course of the mandibular canal. Pónyi and Szabó (1956), through a study of 38 reference points on 528 historical mandibles, established reference points for the placement of mandibular prostheses. In several papers, Prágai and Fazekas (Prágai, 1982; Prágai and Fazekas, 1982, 1983) have reported the results of their investigations of the height of the mandibular spine in the region of molar teeth. Finally, Tóth's (1980/81) report on the frequency of "buck teeth" in Hungary is interesting from an anthropological point of view.

Forensic Dental Anthropology

Forensic medical sections of Hungarian dental anthropology have dealt with important subjects. For example, L. Harsányi (1924-1992) director of the Forensic Medical Institute of Pécs, used scanning electron microscopy to measure morphological changes in cremated teeth (Harsányi, 1977; Harsányi and Nemeskéri, 1962, 1964). By exposing teeth to temperatures ranging from 200° to 1200° C, he could estimate the amount of heat applied through observation of morphological changes in the dentine. As a result, he concluded that teeth from a cremation burial cemetery in Issendorf, Germany, had been exposed to temperatures between 200° and 900° C.

My own work has dealt with forensic osteology for nearly 30 years. Examples of publications are Kósa (1978, 1984, 1989, 1990a, 1990b); Kósa, Szendrényi, and Tóth (1978); Kósa, Ferenczi, and Baláspiri (1985); Kósa and Antal (1988); Kósa, Farcas, and Wittman (1989); and Kósa, Antal, and Farkas (1990).

My first paper, published in 1966, dealt with fetal bones. "Estimation of fetal body length and age on the basis of bone measurements" was the subject of my Candidate's dissertation in 1969, and "Individual and Chronological Age of Human Bones" was the topic of my academic Doctor of Science dissertation in 1990.

My investigation was aimed at the estimation of age and its limits through research carried out with atom absorption spectrophotometry, automatic amino acid analysis, polarization optics, scanning electron microscopy, and electron probe analysis of osteological and dental samples.

I have published 38 papers and delivered approximately 70 scientific lectures in the field of forensic osteology. One of my best known works is the book, *Forensic Fetal Osteology* (Fazekas and Kósa, 1978), which summarizes all the information useful for forensic anthropology, age estimation, and paleoanthropology. Additional publications in books are Clement and Kósa (1989), Kósa (1978, 1989), and Marcsik, Kósa, and Kocsis (1992).

Part of my scientific odontological work has been done with A. Marcsik, first assistant at the Department of Anthropology of Joseph Attila University of Science in Szeged. Another portion is carried out with my co-workers at the Institute and at the Medical University.

My forensic odontological investigations on the estimation of individual age can be summarized as follows: age dependent translucency phenomenon observed on the roots of teeth can determine the age of an individual, in both recent and historical osteological discoveries (Kósa, Szendrényi, and Tóth, 1983). According to our findings, secondary dentine formation generates changes in dimension that show a definite correlation with age (Kósa and Antal, 1988).

Dentine tubules for age estimation have been studied by scanning electron microscope. Results show a significant correlation ($P < 0.01$) between metrics and structure of dentine tubules and age. Therefore, the mean value of dentine tubules provides a good means for estimating individual age (Kósa, 1984). The electron microscope was also used for studying finer dentine structures associated with age. On the teeth of older individuals (over 50) a granular loose structure appears instead of the homogeneous structure of intertubular basic dentine substance. A definite hypermineralization can be seen around the few diminished dentine tubules (Kósa, 1984).

Using atom absorption spectrophotometry, we studied the inorganic content of human teeth and assayed calcium, sodium, potassium, magnesium, iron, zinc, copper, lead, and lithium (Földes et al., 1981). Our results show that the concentration of inorganic elements in teeth is significantly higher than those in bones ($P < 0.05$).

Using electron probe microanalysis, we established that the calcium-potassium weight ratio is higher on the surface of the hypermineralized zone around the dentine tubules than it is in the basic substance between the tubules. Thus, the electron probe microanalysis method offers an excellent means for identifying the age of an individual in dental samples (Kósa, Antal, and Farkas, 1990).

Historical Anthropological Work Team

At the present time, the most intensive dental anthropological research is done in Szeged. The Historical Anthropological Work Team, led by A. Marcsik, has been studying skeletal materials from archaeological excavations. Marcsik defended her Candidate's dissertation in paleoanthropology and paleopathology on "Paleopathology of the Avar Period in the Area between the Danube and Tisza" (Marcsik, 1983).

Another well-known member of the team is G.S. Kocsis, who this year wrote his Candidate's thesis entitled "Developmental Anomalies of the Teeth". Kocsis has studied Avar skeletal materials for a number of years, and has co-authored papers on extra-dental paracoronal formations of tooth enamel (Kocsis and Marcsik, 1980), abnormal dental enamel (Kocsis and Marcsik, 1981), and tooth position disorders on Avar teeth (Kocsis and Marcsik, 1982).

I have also worked with the team to solve specific research problems. Professor Michael Finnegan from Kansas State University has worked with us on several projects. Among these are studies of the relationships of Avar Period skeletal materials in Hungary (Finnegan and Marcsik, 1978) and Stafne defect in archaeological and recent samples (Finnegan and Marcsik (1980, 1981).

Our work has also dealt with the etiology of dental enamel disorders, invagination of the coronary end (Kocsis and Marcsik, 1987), frequency of double-rooted *dens caninus*, and frequency of dental developmental disorders (Marcsik and Baglyas, 1987). We have also described and analyzed paleoanthropological discoveries (Marcsik, 1976, 1983, 1989; Marcsik, Kocsis, and Kurucz, 1984; Marcsik and Kocsis, 1984, 1985, 1986, 1992; Marcsik and Baglyas, 1987; and Marcsik, Kósa, and Kocsis, 1992).

Members of the Historical Anthropological Work team are also studying the prevalence of a developmental disorder of the head of the mandibular joint (*condylus bifidus*) and disorders of Avar period skulls (Szentpétery, Kocsis, and Marcsik, 1990). The work team has also published information on the

anomaly of "adventitious roots" of maxillary central incisors (Kocsis and Marcsik, 1989), morphological properties, and simultaneous occurrence of porotic hyperostosis, dental enamel hypoplasia, and Harris lines in a collection of eighth to tenth century skeletons (Marcsik, 1989). The teeth in this collection have also been studied for *dens invaginate* and *palatolingualis grave* as a secondary pathosis. These data have then been compared with teeth from the Neolithic Era to the Middle Ages (Kocsis and Marcsik, 1991). The same authors have also published a paper on the phenomenon of an unidentified "cavity" in bones on the surface of the posterior part of the mandible (Kocsis, Marcsik, and Mann, 1992).

Recently, the team was invited to write an article on developmental enamel disorders and the occurrence of enamel hypoplasia in prehistoric and historic Hungarians (Marcsik and Kocsis, 1992). We have also written an article based on our paper at the Eighth International Congress on Dental Morphology. The subject is age determination through the transparency of teeth based on a study of historical archaeological materials (Marcsik, Kósa, and Kocsis, 1992).

At the present time, A. Marcsik, G.S. Kocsis, and F. Kósa are the only active Hungarian specialists who are members of the Dental Anthropology Association.

Author's Note

My task, on behalf of the editorial board of the *Dental Anthropology Newsletter* has been to describe the recent scientific tendencies of dental anthropology in Hungary and to introduce prominent representations of the sciences and the latest results in the frame of a short historical review. I hope that anyone that I have omitted will not be offended, as the limits available permitted mention of the most well known scientists contributing to the growth and development of anthropology in Hungary. In addition, Hungarian-language references have been translated into English.

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