משטרת ישראל

The role of the anthropologist in human identification.

Identification of victims of mass disasters is most frequently carried out by reference to dental records. However this method is only applicable if a) there are adequate dental records available for comparison with the victims and b) at least some teeth or supporting alveolar bone is preserved. Even for army personnel, where dental records and fingerprints are routinely taken, these two pre-conditions are not always met. For the civilian population, records are even more incomplete. Large sectors of the population such as minority groups, religious sects, new immigrants and foreign workers to name only a few have no army records, and these include a high percentage of the socio-economic groups with no routine dental care. In case of mass disasters in public places such as cinemas, department stores etc. it may even be difficult to establish who was present-a necessary precondition for differentiating between victims. In criminal cases, a deliberate attempt may be made to prevent identification, or to mislead investigators. These considerations have led to the recognition of a relatively new research speciality-forensic anthropology.

Forensic anthropologists specialize in identification of an individual from examination of the bones and or teeth. Anthropometric techniques, supplemented by radiographs and histology when necessary, are used to determine age, sex, ethnic group and distinguishing features. These are used to obtain an individualized profile that can be compared with records of missing individuals to establish or eliminate their identity. The various stages of analysis require considerable experience and detailed knowledge of anthropological procedures. When carried out corectly they can provide detailed information on even very incomplete and fragmentary remains.

Sex determination

Morphometric characteristics of the skull, pelvis and or long bones are used to determine sex. Like most other skeletal and dental characteristics, these differ in different population groups.

Age determination

The following examinations are made, and compared to standard tables. It should be noted that studies carried out in other countries show that sex, ethnic group, climate, altitude, and socio-economic status all affect developmental rates. Israel is still using data based on American Caucasians, for comparative purposes, which limits the accuracy of the proceedure.

A. Subadult:
1) Dental development and resorption of deciduous teeth.
2) Union of primary centers of ossification and appearence of secondary centers of ossification and epiphyseal closure.
3) Measurement of long bone length.
4) Closure of cranial sutures.

B. Adult: 1) Changes in joint surfaces and ossification of cartilage.

2) Cranial suture closure.

3) Osteon counts.

4) Dental pathology (attrition and periodontal disease).

4) Dentin transparency in tooth roots, histology of cementum.

5) Amino acid racimization of collagen in dentin.

Stature

Standard anthropometric measurements of bones are used to calculate stature from regression equations that are characteristic of specific sex and ethnic group and calibrated for age. Data for Israeli groups is incomplete.

Ethnic affiliation

Anthropometric analysis of teeth and bones yields a specific profile that can be compared with that of different ethnic groups to establish the probable affiliation of the individual under examination. Data for Israeli groups is incomplete.

Individual characteristics

A. Dental

1) Presence of dental restorations and prostheses. (This reflects both socioeconomic status and country of past residence and can be compared with dentists records where available.)

2) Dental morphological characteristics: occlusion, spacing, crowding etc: can be compared with photographs, or other descriptions.

3) Pathology: Caries, attrition and periodontal disease provide some indication of diet, oral hygiene and level of health care. {i.e. socioeconomic status and country of past residence}.

B. Skeletal. (Radiographs are essential)

1) Evidence of past trauma, disease or surgical intervention i.e surgical pins, bony scars or other lesions for comparison with medical records.

2) Asymmetry of limbs or vertebral kyphosis.

3) Evidence of occupation : signs of muscle hypertrophy or dystrophy.

4) Location and type of arthritic or other bony lesions.

NB Anomalies such as cervical ribs, specific patterning of trabecular bone and irregular processes if present, provide additional findings of value for comparison with extant medical records of missing individuals. Further research is necessary to determine their reliability.

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Current Status of Forensic Anthropology in Israel

This science is still in its infancy in Israel. Of the professional anthropologists in full time employment, only one has consistently worked in this area, and this on a part-time basis (reserve duty in the IDF).

If there is to be a serious attempt to improve means of identification, a permanent unit needs to be established, that specializes in forensic anthropology. This unit should carry out routine identifications and co-ordinate research in improving the accuracy of identification procedures. At the very lowest level, basic studies need to be done to improve the reliability of standards used for establishing age and stature, the correlation between skeletal characteristics and external appearance, the individuality of trabecular patterning of the bone and the frequency of different bony anomolies in the various ethnic groups living in this region. It must be emphasized that since these characteristics are population specific, the results derived from studies carried out in other countries are of only limited value when applied to the diifferent ethnic groups comprising the Israeli population. It must be further stressed that the need for developing forensic anthropology is now especially urgent, in view of the current wave of immigration and population change.

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3-2-1991