

# Assessment of Ancestral Background from the Skull: Case Studies from Greece

K Moraitis, C Eliopoulos, C Spiliopoulou, S Manolis

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## Abstract

The assessment of ancestral background from human remains is an important aspect in biological and forensic anthropology. In the human skeleton, craniofacial morphology is considered the most reliable indicator of ancestral phenotype. In addition to craniofacial traits, anthropometric measurements may be employed in the assessment of ancestry. According to these, skeletal remains can be attributed to one of three population groups: Caucasoid, Negroid and Mongoloid. In this study the authors present examples of these population groups that they have encountered while working with human remains in Greece. The examples presented came from a forensic context and a human skeletal collection.

## INTRODUCTION

Race is a concept with both cultural and biological elements. As a result, the term "race" has led to controversies in the past and has been replaced recently with the term ancestry or cultural affiliation. However, regardless of the term used, the objective remains the same for the anthropologist: to determine the population group that a skeleton belongs to. For this to happen, objective, biological criteria must be used. Although the idea of the existence of distinct races within the human species is rejected by the vast majority of physical anthropologists, a contradiction is evident. Forensic anthropologists have to conduct an analysis, part of which is to determine the ancestry of a set of human remains. A relatively late response to this controversial issue was the "Statement on the Biological Aspects of Race" by the American Association of Physical Anthropologists.<sup>1</sup> This statement notes that "Pure races, in the sense of genetically homogenous populations do not exist in the human species".<sup>1</sup> However, while races do not exist, anyone can identify different physical types in humans. This is also answered by the AAPA statement: "Genetic differences between populations commonly consist of differences in the frequencies of all inherited traits...".<sup>1</sup> As Kennedy states, there are no real divisions in our species, but only high frequencies of phenotypic characters in some populations, while in others they may be rare or absent.<sup>2</sup> The distribution of these characters may coincide with certain geographical areas of the world. Therefore, a forensic anthropologist only needs to be equipped with knowledge about the geographic

distribution and frequencies of phenotypic traits in order to determine the ancestry of an individual. In the human skeleton, craniofacial morphology is the most reliable indicator of ancestral phenotype. According to this and other skeletal criteria there are three major population groups to which most people may be assigned: Caucasoid, Negroid and Mongoloid. Individuals that belong to the Caucasoid or "White" group may be found in America, Europe, the Near East, India and North Africa. The Negroid or "Black" group is found in sub-Saharan Africa and the Mongoloid or "Asian" group consists of the Native American groups and the peoples of the Far East. In addition to the categories listed above there are countless combinations that may result from the mixture of these groups.

In general, the Caucasoid group is characterized by a long, narrow face with retreating zygomatics, sloping orbits and lack of prognathism. The nasal aperture is narrow and has a pronounced nasal spine. In the Negroid group the height of the vault is reduced, there is a post-bregmatic depression, square orbits and pronounced prognathism. Also, the nasal aperture is very wide and the nasal spine very slight. The Mongoloid group is recognized by a flat face, rounded orbits and pronounced zygomatics. The nasal aperture and spine have an expression that is between the two extremes of the other two groups.<sup>3,4,5</sup>

In addition to these craniofacial traits, anthropometric measurements may be employed in the assessment of ancestry.<sup>6</sup> This approach involves taking a set of

measurements from an unidentified skull and comparing them to a large computerized database of documented individuals. A computer software known as FORDISC has been developed from data of over 2600 individuals, derived from the Forensic Data Bank of the Forensic Anthropology Center at the University of Tennessee, Knoxville.<sup>789</sup> However, a current disadvantage of the software is the small sample of certain population groups (e.g. Hispanics) in the database.<sup>4</sup> Further to this sophisticated method, measurements can provide indexes or discriminant functions, that are used to distinguish the different ancestral groups.<sup>1011</sup>

In this study the authors present examples of the different population groups that they have encountered while working with human skeletal remains in Greece.

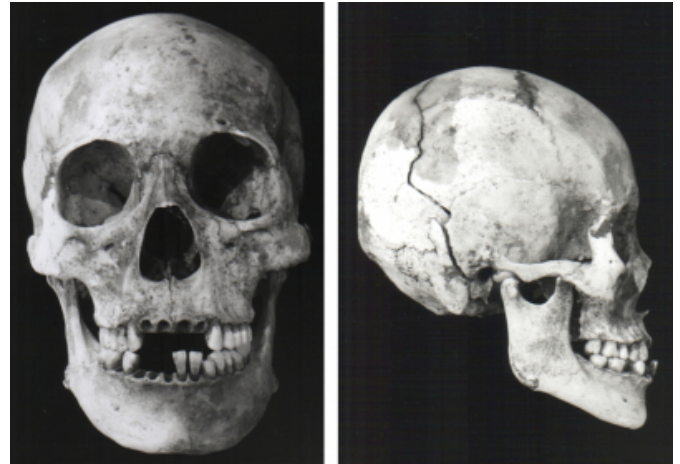
## **CASES EXAMINED**

### **CASE 1**

The first example comes from a forensic case submitted to the Department of Forensic Medicine and Toxicology, Medical School, University of Athens, for anthropological evaluation, and is represented by a skeleton that was found in a Greek island. The forensic anthropological examination revealed that the remains belonged to a young female of Asian ancestry. This helped in narrowing significantly the number of potential matches in the lists of missing persons and led to a quick match. Comparison of antemortem data that included x-rays and dental records led to a positive identification and the remains were returned to the family for cremation. Figure 1 shows the pronounced zygomatics that give an appearance of a flat face and the round shape of the orbits.

### **Figure 1**

Figure 1: Anterior and lateral view of an individual of Asian origin (Case 1).



### **CASE 2**

The second case is represented by a skeleton from the Human Skeletal Collection housed at the Department of Biology, University of Athens, Greece. Also known as the “Athens Collection”, this reference collection consists of 225 documented skeletons.<sup>12</sup> The remains belong to a young female of African origin who died from pathological causes. Figure 2 shows a very wide nasal aperture that lacks a sharp lower border and square-rectangular orbits. A very small nasal spine and pronounced prognathism, characteristic of the Negroid group, can be also readily observed.

### **Figure 2**

Figure 2: Anterior and lateral view of an individual of African origin (Case 2).



### **CASE 3**

This specimen comes from the Athens Collection. It belongs to a young Caucasian male of Greek origin who died of traumatic injuries. The face here is long and narrow, the orbits are slightly sloping and the nasal aperture narrow with a prominent sharp lower border (Figure 3). In the lateral view a lack of prognathism and a somewhat pronounced

nasal spine can be seen.

The cases reviewed above illustrate how simple it is to differentiate between the various ancestral groups when they are typical of the population that they belong to. However, there are cases where individuals are of mixed ancestry and the population specific characters may not be so obvious.

**Figure 3**

Figure 3: Anterior and lateral view of an individual of Greek origin (Case 3)



**CASE 4**

This case is an elderly female individual of Armenian origin from the Athens Collection, and exhibits a pattern of nasal root that is very similar to that of the Negroid group (Figure 4). The morphology of the nasal bones is flat and the bone between the orbits wide, although the nasal aperture follows the Caucasoid pattern, being narrow.

**Figure 4**

Figure 4: Anterior view of an individual of Armenian origin (Case 4).



**CASE 5**

The last case is represented by a middle-aged female of Turkish origin from the Athens Collection. All features in this case follow the Caucasoid pattern, except for the obvious post-bregmatic depression (see arrow Figure 5), a trait that is commonly found in Negroids. According to Rhine<sub>13</sub>, the post-bregmatic depression is a small depression situated behind bregma on the cross section of the sagittal and coronal sutures.

**Figure 5**

Figure 5: Lateral view of an individual of Turkish origin (Case 5).



**DISCUSSION**

Although in the last two cases the exact family tree of the persons is not known, one can propose that their background was of mixed ancestry, based on the mixed ancestral features. These two examples show the difficulties involved in determining the ancestral background of individuals that have a mix of ancestral traits. In order to increase the anthropologist's confidence in this assessment, one has to carefully examine all the traits, especially those found in the skull. The results of any forensic anthropological analysis have to be communicated to law enforcement officials in a clear manner, so that an effective investigation can take place. This includes information on the ancestral background of an individual. Since a statement of the kind "the skeletal remains belong to an individual with a wide nasal aperture and prognathism" would mean little to police investigators, terminology consistent with social convention is customarily used. Byers uses definitions for ancestral groups that are derived from the U.S. Bureau of the Census.<sup>5</sup> According to this set of definitions, persons of mainly European descent are described as White, those of African origin are termed Black and Asian are individuals from the Far East. It should be kept in mind that using the above terminology does not necessarily imply that one embraces the concept of race. It only means that such an assessment is a "...prediction that an individual, while alive was assigned to a particular socially constructed 'racial' category... regardless of whether or not such a race actually exists in nature".<sup>14</sup> These terms then, only serve as "labels of convenience" for the purpose of identifying human skeletal remains in a forensic

investigation.

As the influx of immigrants into Greece is continued, a notable increase of the number of people with diverse physical features is expected to appear in the anthropologist's laboratory. However, according to the 2001 Census from the National Statistical Service of Greece (NSSG) only 1% of the immigrants residing in Greece belong to the Negroid and the Mongoloid group respectively.<sup>15</sup> Forensic specialists should develop a strategy to deal with these cases, especially those of mixed ancestry. This proposed strategy requires a good knowledge of the human skeleton, so that traits related to sex, age and activity are not misunderstood to be traits of ancestral affiliation. Also required is a knowledge of the geographical distribution and frequencies of these phenotypic traits, their different forms of expression and even the subtle signs that can be found in individuals of mixed ancestry. The assistance that can be provided by an experienced anthropologist is essential and should be sought for all cases where skeletal remains are found. This can only lead to an effective assessment of human skeletal remains and a positive identification such as in the first case presented.

**CORRESPONDENCE TO**

Dr. Konstantinos Moraitis Department of Forensic Medicine and Toxicology, School of Medicine, University of Athens, 75 M. Asias Str., Goudi, Athens 115 27, Greece E-Mail: kmoraitis@med.uoa.gr Tel: +30-210-7462426 Fax: +30-210-7706868

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**Author Information**

**Konstantinos Moraitis, Ph.D.**

Department of Forensic Medicine and Toxicology, School of Medicine, University of Athens

**Constantine Eliopoulos, Ph.D.**

Department of Animal and Human Physiology, Faculty of Biology, University of Athens

**Chara Spiliopoulou, MD, PhD**

Department of Forensic Medicine and Toxicology, School of Medicine, University of Athens

**Sotiris Manolis, Ph.D.**

Department of Animal and Human Physiology, Faculty of Biology, University of Athens