

Bone Clones[®]

OSTEOLOGICAL REPRODUCTIONS

Human Female Scaphocephalic Skull BC-193



Osteological Evaluation Report

Prepared by

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Human, Probable Female, Scaphocephaly

Product Number: BC-193

Specimen Evaluated: Bone Clones® replica

Skeletal Inventory: 1 intact cranium
1 intact mandible

General observations:

In general, the molding process has preserved significant details necessary for evaluation. The skull is markedly elongated (in the anteroposterior plane), has a very high forehead, and a deeply sloping parieto-occipital region. The ectocranial morphology of the individual cranial bones is within normal limits. The sagittal suture is absent; the two markedly elongated parietal bones are fused at the midline, and a small ridge/elevation sits at what would have been the site of the sagittal suture. The cranial sutures are otherwise normally configured. There is a left epipteric bone, and a left paramidline lambdic ossicle. The bilateral foramen lacerum are somewhat enlarged; the foramina are otherwise of expected configuration. The skull is atraumatic.

Dentition:

There are 14 teeth in the maxillary arcade and 14 teeth in the mandibular arcade. All teeth have an adult morphology and no deciduous dentition remains. The dentition is atraumatic. There are no dental restorations or prostheses. There is a mild degree of attrition.

The following maxillary dentition is present: 1.7 [#2], 1.6 [#3], 1.5 [#4], 1.4 [#5], 1.3 [#6], 1.2 [#7], 1.1 [#8], 2.1 [#9], 2.2 [#10], 2.3 [#11], 2.4 [#12], 2.5 [#13], 2.6 [#14], and 2.7 [#15].

The following mandibular dentition is present: 3.7 [#18], 3.6 [#19], 3.5 [#20], 3.4 [#21], 3.3 [#22], 3.2 [#23], 3.1 [#24], 4.1 [#25], 4.2 [#26], 4.3 [#27], 4.4 [#28], 4.5 [#29], 4.6 [#30], and 4.7 [#31].

There is marked linguoversion of 1.5 [#4]. The distolingual enamel shell is absent on 2.7 [#15]. There is type I furcation involvement of 3.6 [#19] and 4.6 [#30].

Features of Race:

The interocular distance is broad. The nasal root is depressed and the nasal angle is obtuse. The zygomatic bones retreat posteriorly from the plane of the face. The nasal aperture is broad superiorly and inferiorly. The anterior nasal spine is somewhat prominent and the inferior margin of the nasal aperture has a sharp (nasal) sill. The shape of the maxillary dental arcade is equivocal. There is moderate alveolar prognathism. The maxillary incisors are shovel-shaped. There is no edge-on-edge incisal bite. There is no post-bregmatic depression. The calvarial sutures are complex (especially the lambdoid).

This individual has mixed traits that span the spectrum of Asian, Black and White individuals.

Features of Sex:

There is mild prominence of the cranial sites for musculofascial attachment including especially:

- the external occipital protuberance (slight)
- the temporal lines (slight)
- the supraorbital tori (slight)
- the occipital condyles

There is a narrow ascending mandibular ramus. The nasion is somewhat rough, and the supraorbital margins are blunted. The inferior border of the mandible is somewhat square.

The totality of features is slightly more suggestive of female than male sex.[1]

Features of Age:

There are no identifiable fontanelles. The spheno-occipital synchondrosis is fused.

Ten ectocranial osteologic landmarks are evaluated for degree of suture closure according to the Meindl and Lovejoy method*. [2] Scores are assigned as follows:

1	--
2	--
3	--
4	--
5	1
6	1
7	1
8	1
9	1
10	1

* As is always the case with casting, there is a tendency towards overscoring.

The sum of scores for the anterior cranium (landmarks 6 through 10) is 5. This corresponds to an estimated age of 41.1 +/- 10.0 years.

SUMMARY:

1. Mixed racial features.
2. Probable female.
3. Adult, most likely greater than 30 years of age.
4. Craniosynostosis.
 - a. Scaphocephaly (premature fusion of the sagittal suture) with marked dolichocephaly.
5. Linguoversion of 1.5 [#4].
6. Localized mild periodontal disease (3.6 [#19], 4.6 [#30]).
7. No evidence of trauma.
8. No evidence of significant osteologic variations.

EDUCATIONAL RESOURCES:

1. This is a very complex specimen.
2. Assessment of race, sex and age are difficult as a consequence of scaphocephaly and marked dolichocephaly.
 - a. There are mixed racial features with a slight preponderance towards the Asian/Black spectrum.
 - b. Given the above racial features, more likely than not, this individual was a female.
 - c. It is difficult to evaluate age by assessing cranial suture closure because of the premature fusion of the sagittal suture – if points along the sagittal suture are scored as a “3” (i.e., closed), the skull would be aged erroneously high.
3. The concept of race assessment is controversial. It may be worthwhile to review the varying schools of thought on this issue. Short summaries from the perspective of the forensic anthropologist[3] and forensic pathologist[1] are readily available.
4. In many circumstances, the skull alone will allow an investigator to correctly determine sex.[4] However, the findings in the skull should never be treated in isolation; rather, they should be incorporated into your ‘whole case’ database. This database should include information obtained from all other aspects of the case. From an osteologic perspective, this includes (importantly) the bones of the pelvis.
5. Age assessment of skeletal remains is best done in the context of the entire skeleton. Assessment of the degree of suture closure can be used with some degree of success[2]; however, there is tremendous variability in the degree of closure process. Students must be cautioned that statistical data is based on **populations**, and may not necessarily be reflective of reality in an **individual**.
6. This is an excellent example of scaphocephaly with prominent dolichocephaly. It may serve as a discussion piece for the topic of craniosynostoses.[5, 6]

REFERENCES:

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3. Gill, G. (1998). Craniofacial criteria in the skeletal attribution of race. In *Forensic Osteology: Advances in the Identification of Human Remains*, K. Reichs, Editor. Springfield, IL: Charles C. Thomas.
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DISCLAIMERS:

This report is meant only as a teaching tool for introductory level students of the anatomical, anthropology or forensic sciences who might be using this specimen to learn human and forensic osteology. Evaluation of osteologic material is best done with original specimens. My evaluation was based solely upon studies of a Bone Clones® replica. My opinions are based solely upon the material presented to me. This is somewhat artificial as in real forensic investigations additional studies would be undertaken prior to the formulation of diagnoses and the production of a report. These studies might include plain film radiography, computed tomography (CT) studies, histology, etc. My opinions regarding race and sex are based only upon non-metric analyses. Evaluation of cranial suture closure is most accurately assessed endocranially as the sutures are known to close from the endocranial table towards the ectocranium. My opinions regarding this skull were made without access to the postcranial skeleton.

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Bone Clones Disclaimer on Ancestry Assessment

The assessment of ancestry from human skeletal remains, particularly the skull, is a component historically included in the creation of a biological profile for forensic purposes. This practice involves the analysis of morphoscopic traits and metric variables that may exhibit population-specific patterns of variation. However, it is important to recognize the significant scientific and ethical limitations of this practice.

Race is not a biologically valid concept. Contemporary biological anthropology holds that race is a social construct with no discrete biological basis. Human variation exists on a continuum, shaped by complex interactions between genetics, environment, and culture—not distinct “racial” categories. Therefore, the identification of “race” or “ancestry” based solely on skeletal features is scientifically problematic and cannot be performed with high accuracy or precision.

Although some morphological traits of the cranium may reflect broad population-level patterns due to shared evolutionary history, these traits do not map neatly onto socially defined racial categories. Furthermore, categories such as “Asian,” “European,” or “African” are socially constructed labels that do not fully capture genetic or phenotypic diversity, and they should not be interpreted as exact or absolute identifiers. As such, ancestry estimation based on skeletal features should not be interpreted as the identification of race, and results should be presented with appropriate caution and clear communication of limitations.

Historically, law enforcement agencies have requested ancestry estimations as part of forensic reports. However, many biological anthropologists today are increasingly hesitant to include this component, as doing so may inadvertently reinforce outdated and harmful typological thinking—the idea that humans can be classified into discrete biological “types” based on physical features. Such typologies have a long and problematic history and are not supported by modern science.

In cases where ancestry estimation is included, it is done with the understanding that it is a probabilistic assessment—not a definitive classification—and it must be contextualized within a broader ethical framework that prioritizes scientific integrity, individual dignity, and the avoidance of reinforcing racial stereotypes.