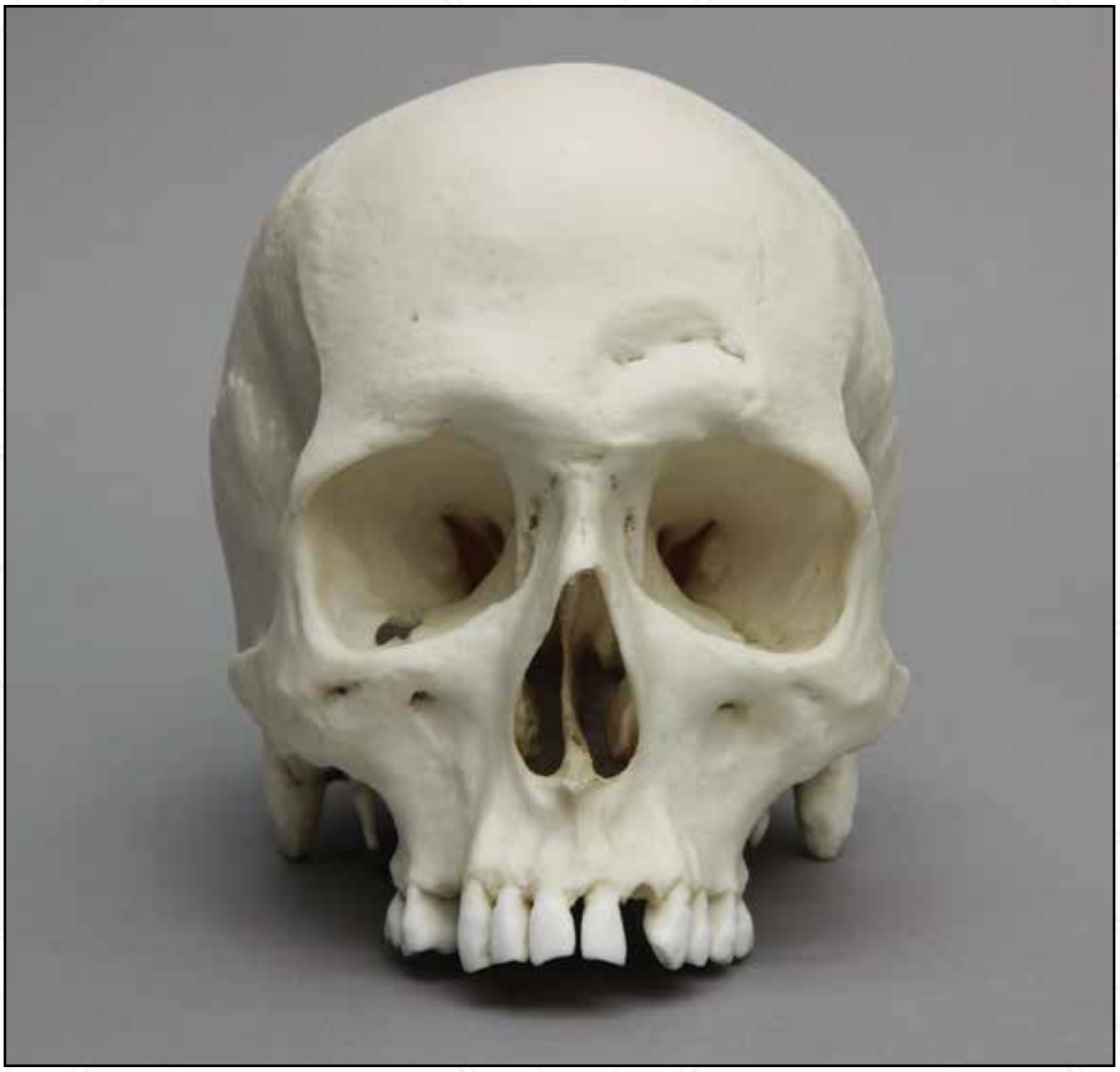
Bone Clones®

OSTEOLOGICAL REPRODUCTIONS

Human Male Cranium with Hammer Blows
BC-217



Osteological Evaluation Report

Prepared by

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Human, Male, White, Healed hammer blows

Product Number: BC-217

Specimen Evaluated: Bone Clones® replica

Skeletal Inventory: 1 intact cranium

General observations:

In general, the molding process has preserved significant details necessary for evaluation. The general shape and configuration of the skull is within normal limits. The ectocranial morphology of the individual cranial bones is within normal limits. The sutural patterns are of expected configuration; however, there is advanced fusion/ossification. There is the suggestion of bilateral epipteric bones. The foramina are of expected configuration.

Dentition:

There are 10 teeth in the maxillary 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 moderate degree of attrition.

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

The atraumatic gomphoses of 1.5 [#4], 1.4 [#5], 2.2 [#10] are empty and are without signs of healing.

1.8 [#1] and 2.8 [#16], and their gomphoses, are not present.

Both 1.6 [#3] and 2.6 [#14] have cusps of Carabelli.

2.7 [#15] has a small lingual groove defect, suggestive that an amalgam filling has fallen out.

There is generalized mild to moderate periodontal disease, with the molar teeth showing furcation involvement.

Features of Race:

The interocular distance is not prominently widened. The nasal root is prominent and the nasal angle is acute. The zygomatic bones retreat posteriorly from the plane of the face. The nasal aperture is narrow both superiorly and inferiorly. The anterior nasal spine is short, and the inferior margin of the nasal aperture has a sharp (nasal) sill. The maxillary dental arcade has a somewhat rectangular-shape. It is not possible to assess the degree of alveolar prognathism; however, the maxillary arcade projects slightly. The maxillary incisors are blade-shaped. It is not possible to assess for edge-on-edge incisal bite. There is no post-bregmatic depression. The calvarial sutures are focally complex (at least at the extremes of the coronal suture).

The totality of features is most in keeping with those of a White individual.

Features of Sex:

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

- the nuchal lines
- the external occipital protuberance
- the mastoid processes of the temporal bones
- the temporal lines
- the supraorbital tori
- the occipital condyles
- the supramastoidal crest

The nasion is somewhat rough, and the supraorbital margins are blunted.

The totality of features is most in keeping with male sex.

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*.[1] Scores are assigned as follows:

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

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

The sum of scores for the cranial vault (landmarks 1 through 7) is 18. This corresponds to an estimated age of 48.8 +/- 10.5 years.

The sum of scores for the anterior cranium (landmarks 6 through 10) is 10. This corresponds to an estimated age of 51.9 +/- 12.5 years.

Trauma:

A depressed circular defect is on the left side of the frontal bone, along the superior margin of the left orbit. The depression is not of uniform depth, and the margins and surfaces are smooth, indicating that it is a healed/healing injury.

A second depression, on the lateral aspect of the right parietal bone, is also vaguely circular, but has an imprinted pattern of parallel ridges. Again, the peripheral margins and surfaces of the depression are smooth, indicating that this right parietal depression is a healed/ healing injury.

The circular shape, the size, and the depressed nature of the left frontal and right parietal lesions are consistent with blunt trauma inflicted by blows with the head of a hammer.

SUMMARY:

1. White.

2. Male.

3. 39.4 –59 years; range 38 – 64.4 years.

4. Two healed or healing depressed skull fractures:
    a. Consistent with blunt trauma inflicted with a hammer.

5. No evidence of significant osteologic variations or primary pathology.

EDUCATIONAL RESOURCES:

1. This is an excellent example of the skull of a White male.
    a. 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[2] and forensic pathologist[3] are readily available.
    b. 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.
    c. 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[1]; 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**.
2. This is an excellent example of healed or healing blunt trauma, in a pattern that is classic for blows delivered by a hammer.
3. It may be appropriate to discuss the broad spectrum of sequelae that may develop after blunt head trauma (e.g. meningitis, intracranial hemorrhages, etc.).
4. It may be appropriate to discuss the rather critical role of radiography (including computed tomography) in the evaluation of traumatized human remains.

REFERENCES:

1. Meindl, R.S. and Lovejoy, C.O. (1985). Ectocranial suture closure: a revised method for the determination of skeletal age at death based on the lateral-anterior sutures. *American Journal of Physical Anthropology,* 68(1): 57-66.
2. 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.
3. Matshes, E. and Lew, E. (2006). Forensic osteology. In *Forensic Pathology: Principles and Practice*, D. Dolinak, E. Matshes, and E. Lew, Editors. San Diego, CA: Elsevier (Academic Press).
4. Krogman, W. and Iscan, M. (1986). *The Human Skeleton in Forensic Medicine*. 2 ed. Springfield, IL: Charles C. Thomas.

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. 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.