

Bone Clones[®]

OSTEOLOGICAL REPRODUCTIONS

Human Male Skull with Machete Wounds BC-185



Osteological Evaluation Report

Prepared by

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Human, Male, Machete injuries

Product Number: BC-185

Specimen Evaluated: Bone Clones® replica

Skeletal Inventory: 1 partial cranium
1 intact mandible

General observations:

In general, the molding process has preserved significant details necessary for evaluation. The general shape and configuration of the remaining skull is within normal limits. The ectocranial morphology of the individual remaining cranial bones is within normal limits. The sutural patterns are of expected configuration within the remaining skull. There are no sutural bones (Wormian ossicles). The foramina are of expected configuration.

Dentition:

There are 16 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.

On 1-5 (#4), there is a small lingual defect, suggestive of caries (decay). On 2-4 (#12), the buccal enamel is irregularly absent. On 2-7 (#15), the lingual enamel is irregularly absent. On 3-8 (#17), there is a large mesio-occluso-buccal defect suggestive of caries. The 3-6 (#19) is absent, and the gomphosis is healed. The 4-6 (#30) tooth is absent, and the gomphosis is healed. There is a large crateriform defect on the occluso-lingual surface of 4-7 (#31) suggestive of caries.

Features of Race:

The interocular distance is prominently widened. The nasal root is prominent and the nasal angle is obtuse. The right zygomatic bone retreats posteriorly from the plane of the face. The nasal aperture is narrow superiorly and broader inferiorly. The anterior nasal spine is short, and the inferior margin of the nasal aperture has the slight suggestion of bilateral gutters; there is no nasal sill. The maxillary dental arcade has a somewhat rectangular shape. There is a mild-to-moderate degree of alveolar prognathism. The maxillary incisors are blade-like. There is almost an edge-on-edge incisal bite. It is not possible to assess for a post-bregmatic depression. The remaining calvarial sutures are predominantly simple.

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

Features of Sex:

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

- the nuchal lines
- the mastoid processes of the temporal bones
- the masseteric tuberosities of the mandible (slight)
- the occipital condyles
- the supramastoidal crest (prominent)

There is a broad ascending mandibular ramus. The nasion cannot be assessed. The right supraorbital margin is blunted. The inferior border of the mandible is somewhat square.

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.

Due to the degree of calvarial trauma, it is not possible to evaluate for degree of suture closure according to the Meindl and Lovejoy method*.[1]

The totality of features is most in keeping with those of an adult.

Osteologic Features:

There is a slightly depressed, healed (remote) fracture of the distal bilateral (right greater than left) nasal bones. There is slight right lateral deviation of the vomer.

Trauma:

The most obvious/striking feature of this skull is the absence of the left side of the cranium as well as the superior portion of the right side of the cranium and a portion of the left facial bones, down to and including the left zygoma and a portion of the midfacial and sinonasal bones. The defect exposes the right ethmoidal air cells, the left side of the sphenoid sinus and the left maxillary sinus.

Additional features indicate that this large defect resulted from trauma, the details of which suggest a particular type of weapon. A transverse, linear defect begins at the left external auditory meatus and extends posteriorly and slightly superiorly as it crosses the region above the left mastoid process. The inferior margin of this linear defect is chipped. Note that a transverse linear defect across the lateral aspect of the mandibular condyle and coronoid process aligns with, and is probably part of, the larger transverse linear defect. A second transverse linear defect is across the left side of the occipital bone, at a level just inferior to the first transverse defect. This second defect is more horizontal than the first defect. A third and separate transverse defect is across the right side of the occipital bone. Again, this defect is not perfectly horizontal, but slopes slightly downward and to the right. A fracture continues from the inferior border of this third defect and extends anteriorly through the basal portion of the occipital bone to terminate at the posterior margin of the foramen magnum. Secondary fractures branch from the right side of this fracture and can be seen in the right side of the basal portion of the occipital bone. A transverse fracture through the right parietal bone may represent the termination of yet another linear defect; the inferior border of the left end of the fracture would be most consistent with this being another linear defect. Additional linear defects are suggested by the linear nature of the defects across the right parietal bone. One small linear defect is in each of the left mid-petrous portion of the temporal bone (endocranial aspect), and the hypophyseal fossa (fracturing the dorsum sellae).

The linear nature of these defects is consistent with multiple strikes by the blade of a machete.

SUMMARY:

1. Adult Black male.
2. Multiple chop-type injuries of the cranium, with loss of much of the calvarium.
3. Remote nasal fractures.
4. No evidence of significant osteologic variations or primary (non-traumatic) pathology.
5. Multiple sites of active/untreated dental decay.

EDUCATIONAL RESOURCES:

1. This is an excellent example of chop injuries, as produced by machete (which is exactly what the weapon turned out to be).
2. The remaining osteologic features are those of an adult Black male; this evaluation can be challenging, and may provide excellent fodder for laboratory discussions.
 - 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.
3. This specimen contains a good example of a remote nasal fracture.

REFERENCES:

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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. 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.