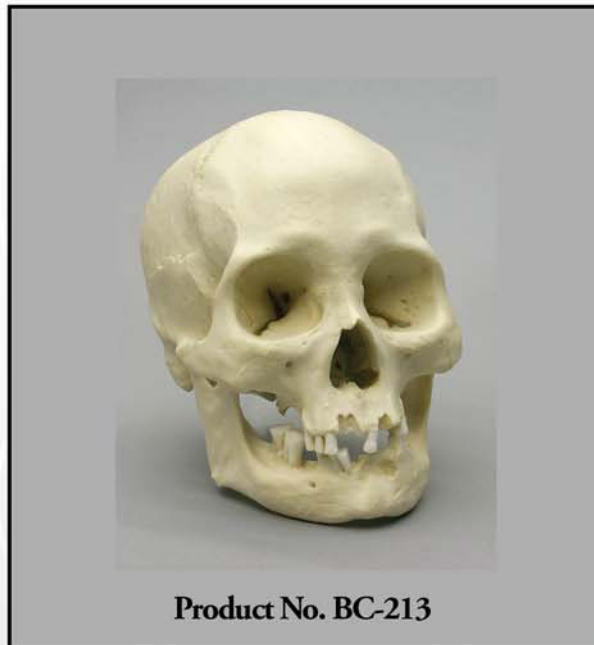


# OSTEOLOGICAL EVALUATION

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**Human Female American  
Indian Skull**



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# **Human, Probable Female, Asian**

**Product Number:** BC-213

**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 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. There are no sutural bones (Wormian ossicles). The foramina are of expected configuration. The skull is atraumatic.

## **Dentition**

There are 6 teeth in the maxillary arcade and 8 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.

The following maxillary dentition is present: 1.5 [#4], 1.4 [#5], 1.3 [#6], 2.1 [#9], 2.4 [#12], and 2.5 [#13].

The following mandibular dentition is present: 3.7 [#18], 3.5 [#20], 3.4 [#21], 4.3 [#27], 4.4 [#28], 4.5 [#29], 4.7 [#31], and 4.8 [#32].

The atraumatic gomphoses of 1.2 [#7], 1.1 [#8], 2.2 [#10], 2.3 [#11], and 3.6 [#19] are empty and without signs of healing.

Healed gomphoses include: 1.8 [#1], 1.7 [#2], 1.6 [#3], 2.6 [#14], 2.7 [#15], 2.8 [#16], 3.8 [#17], 3.3 [#22], 3.2 [#23], 3.1 [#24], 4.1 [#25], 4.2 [#26], and 4.6 [#30].

There is generalized severe attrition (2-4 millimeters of crown structure remaining). Moderate to severe periodontal disease is characterized by type III furcation involvement of the mandibular molars. There is dehiscence of the (buccal) cortical bone overlying 2.4 [#12]. There is supraeruption of the mandibular molars. An irregular bony defect is associated with the gomphosis of 3.3 [#22].

**Features of Race:**

The interocular distance is not prominently widened. The nasal root is depressed and the nasal angle is obtuse. The robust zygomatic bones are broad. The nasal aperture is somewhat narrow superiorly and inferiorly. The anterior nasal spine is very short, and the inferior nasal margin is smooth and depressed; there are no gutters, nor is there a sill. The maxillary dental arcade has a somewhat round- to rectangular-shape. There is no alveolar prognathism. Due to the severe degree of attrition, it is not possible to assess for a shovel-shape on the single remaining maxillary incisor (2.1 [#9]). There is no post-bregmatic depression. The calvarial sutures are complex.

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

**Features of Sex:**

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

- the nuchal lines
- the mastoid processes of the temporal bones (slight)
- the temporal lines (slight)
- the supraorbital tori (slight)
- the occipital condyles
- the supramastoidal crest

There is a broad ascending mandibular ramus. The gonion angles flare slightly. The nasion is smooth, and the supraorbital margins are blunted. The inferior border of the mandible is rounded.

*The totality of features is most in keeping with female sex.*

## ***Bone Clones® Osteological Evaluation Report***

### **Features of Age:**

There are no identifiable fontanelles. The sphenio-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:

<b>1</b>	1
<b>2</b>	1
<b>3</b>	2
<b>4</b>	2
<b>5</b>	1
<b>6</b>	2
<b>7</b>	3
<b>8</b>	3
<b>9</b>	3
<b>10</b>	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 12. This corresponds to an estimated age of 45.2 +/- 12.6 years.

The sum of scores for the anterior cranium (landmarks 6 through 10) is 13. This corresponds to an estimated age of 56.2 +/- 8.5 years.

**SUMMARY:**

1. Asian.
2. Probable female.
3. 47.7 – 57.8 years; range 32.6 – 64.7 years.
4. No evidence of trauma.
5. No evidence of significant osteologic variations.
6. Severe generalized attrition.
7. Moderate to severe periodontal disease (type 3 furcation involvement of mandibular molars).
8. Probable abscess on 3.3 [#22].
  - a. Radiologic evaluation would be required.



**EDUCATIONAL RESOURCES:**

1. This is a very complex specimen.
2. This is an excellent example of a skull with Asian traits.[2] It may serve as a good discussion piece for the osteologic spectrum of “Asian” individuals, and it may be appropriate to discuss some of the features authors might use to subcategorize within this group.[3]
  - 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[3] and forensic pathologist[2] are readily available.
    - i. It is important to consider both homogeneity and incredible heterogeneity within this racial category. I have evaluated skulls from known Chinese individuals that would be osteologically (non-metrically) indistinguishable from this individual of American Indian background.
3. In this case, the non-metric evaluation of sex (limited to the skull) is very difficult. Although the totality of features is in keeping with those of a female, the generalized robustness of the specimen could logically lead to the diagnosis of male sex. It is important to emphasize that determination of sex is optimally done within the context of the different racial groups.
  - a. 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.
4. 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**.
5. This specimen might serve as an excellent discussion piece for the dental pathology that may result from poor oral hygiene.

## ***Bone Clones® Osteological Evaluation Report***

### **REFERENCES:**

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2. 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).
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.
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. 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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