

Bone Clones[®]

OSTEOLOGICAL REPRODUCTIONS

Human Male 13-year-old Partial Skeleton FM-509-SET



Osteological Evaluation Report

Prepared by

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Human, European American, Male 13-Year-Old Partial Skeleton

Product Number: FM-509-SET

Known Information:

These bones are from a 13-year-old, 5'3" and 120 lbs, European American male. This information was documented at the time of the individual's death.

Maxwell Museum of Anthropology:

The Maxwell Museum of Anthropology's Laboratory of Human Osteology, at the University of New Mexico, specializes in numerous facets of physical anthropology. The laboratory serves as a repository of human remains and includes prehistoric, historic, documented, and forensic remains.

Established in 1984 by Dr. J. Stanley Rhine, the Maxwell Museum's Documented Skeletal Collection has grown to include 237 individuals (as of July 2005) encompassing both sexes, all ages, and many population groups. The skeletal remains are obtained by donation, either by the individual before death, or by the family of a deceased loved one. Information on the sex, age, population affinity, and cause of death is available for the majority of these individuals, allowing students and visiting researchers to develop and test new techniques and theories.

Since 1995, prospective donors or their families have been asked to provide health and occupational data as well. With this information, researchers are able to examine the skeletal manifestations of particular diseases including degenerative joint and disc diseases, lymphoma, and osteoporosis, as well as the reaction of bone to repetitive motions and trauma. Recent research has included efforts towards the identification of handedness in individuals, determination of body mass from the skeleton, and variation in cranial damage from various projectiles. The importance of the Documented Collection cannot be overstated. No other institution in the American West has as large a collection of human skeletal remains with such extensive demographic data.

Bone Clones is grateful to the Maxwell Museum for allowing us to select specimens for reproduction from their valuable collection and granting us exclusive casting rights to these pieces.

Human, Adolescent (12-16 years)

PRODUCT NUMBER:

FM-509-SET

SPECIMEN EVALUATED:

Bone Clones® replicas

SKELETAL INVENTORY:

Left scapula with separate coracoid process epiphysis

Left clavicle without medial epiphysis

Manubrium

Three sternbrae

C1

C2

Probable C3

Probable C4

Probable T4

Probable L3

Left ilium

Left ischiopubis

Five sacral vertebrae

Left humeral diaphysis with separate proximal and distal (capitulum) epiphyses

Left radial diaphysis with separate proximal and distal epiphyses

Left ulnar diaphysis with separate distal epiphysis

Left femoral diaphysis with separate proximal, distal and greater trochanteric epiphyses

One patella

Left tibial diaphysis with separate proximal and distal epiphyses

Left fibular diaphysis with separate proximal and distal epiphyses

GENERAL OBSERVATIONS:

In general, the molding process has preserved significant details necessary for evaluation. The remains are totally skeletonized.

OSTEOLOGIC OBSERVATIONS:

General shape and configuration of the individual bones is within normal limits. There are no features suggestive of acute/recent or remote trauma.

TRAUMA:

All skeletal elements are atraumatic.

AGE DETERMINATION:

Epiphyseal Union:

The anterior arch of C1 is complete.

The posterior arch of C1 is complete.

The inferior surface of C2 is somewhat irregular.

The arches of ?C3, ?C4, ?T4 and ?L3 are fused to their corresponding vertebral bodies. The epiphyseal rings of ?C3, ?C4, ?T4 and ?L3 are not fused to their corresponding bodies.

None of the sacral vertebral bodies are fused, nor are the sacral lateral joints or auricular surfaces completely developed.

The scapular coracoid epiphysis is not fused and is absent. The glenoid cavity has a nearly mature morphology. There is a slight irregularity of the inferior scapular angle. The scapular vertebral border is smooth. The acromion epiphysis is not fused.

The medial epiphysis of the clavicle is not fused and is absent.

The ischiopubic ramus is fused. There is little to no fusion of the tripartate cartilage within the acetabulum. The epiphyses of the iliac crest, pubic tuberosity and the ischial tuberosity are not fused and are absent.

The femoral head and greater trochanter epiphyses are not fused to the diaphysis. The lesser trochanteric epiphysis is not fused and is absent.

The proximal and distal tibial epiphyses are not fused to the diaphysis.

The proximal and distal tibial epiphyses are not fused to the diaphysis.

Albert Method for Evaluation of Vertebral Centra Epiphyseal Union:

The pattern and stage of vertebral centra epiphyseal union are in keeping with an Albert score of 0 “early” to 0 “late”. This suggests that the individual was less than 14 years of age (if they were female), or less than 16 years of age (if they were male).[1]

Todd Pubic Symphysis Scoring System:

There are no degenerative features on the pubic symphyseal surface. This is in keeping with a Todd phase of 1.[2, 3]

Suchey-Brooks Pubic Symphyseal Phase:

There are no degenerative features on the pubic symphyseal surface. This is in keeping with a Suchey-Brooks phase I.[4]

Bone Length[5]:

The femur (including the epiphyses) is 43.6 cm long. This corresponds with 14 years of age (male) and 16 years of age (female).

The tibia is 37 cm long. This corresponds with 16 years of age (male).

The totality of features is most in keeping with an individual between 12 – 16 years of age at the time of death.

SUMMARY:

1. Not able to determine sex (subadult specimen).
2. Most likely 12 to 16 years of age.
3. No evidence of trauma.

EDUCATIONAL RESOURCES:

1. This is an excellent example of an adolescent skeleton.
2. Age assessment of skeletal remains is best done in the context of the entire skeleton. Integration of data from a broad set of studies is optimal. Investigators should offer the age range most safely suggested by the totality of studies. Students must be cautioned that statistical data is based on **populations**, and may not necessarily be reflective of reality in an **individual**.
3. Race and sex cannot be reliably determined on subadult remains.[6]

REFERENCES:

1. Albert, A.M. and Maples, W.R. (1995). Stages of epiphyseal union for thoracic and lumbar vertebral centra as a method of age determination for teenage and young adult skeletons. *Journal of Forensic Science*, 40(4): pp. 623-33.
2. Ubelaker, D. (1999). *Human Skeletal Remains: Excavation, Analysis, Interpretation*. 3 ed. Washington, DC: Taxacum Press.
3. Buikstra, J. and Ubelaker, D. eds. (1994). *Standards for Data Collection from Human Skeletal Remains: Proceedings of a Seminar at the Field Museum of Natural History Organized by Jonathan Haas*. Arkansas Archeological Survey Research Series No. 44. Fayetteville, AR: Arkansas Archeological Survey.
4. Brooks, S. and Suchey, J. (1990). Skeletal age determination based on the os pubis: a comparison of the Acsadi-Nemeskeri and Suchey-Brooks methods. *Human Evolution*, 5(3): pp. 227-238.
5. Bass, W. (1995). *Human Osteology: A Laboratory and Field Manual*. Columbia, MO: Missouri Archeological Society.
6. 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).

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.

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