

**Human Skeletal Remains from
Brimstone Hill Fortress National Park,
St. Kitts, West Indies, 2006**

Brimstone Hill Fortress Archaeological Project Report No. 30

By

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Introduction

During maintenance work at the Brimstone Hill Fortress National Park in 2006, bone fragments were uncovered. When the remains were recognized as human, they were bagged and set aside. Work was then continued in a slightly different area so as not to disturb the rest of the burial. After the remains were brought to the attention of University of Tennessee archaeologists, a request was made to have them analyzed during excavations sponsored by the Brimstone Hill Fortress National Park Society and The University of Tennessee.

The area where the remains were uncovered is located below the Magazine Bastion. Excavations in 2004 at site BSH 4 located at the base of the Orillon Bastion uncovered a human burial (BSH 4 Burial 1) (DiGangi 2005) and installment of a utility pole in this same area in early 2005 uncovered human bone fragments, designated as BSH 4 Burial 2 (DiGangi 2006). In addition, there is evidence that other burials are located between the Magazine and Orillon Bastions (Schroedl 2000). Therefore, it was decided to designate these remains as BSH 4 Burial 3.

Materials

Non-duplication of the recovered skeletal elements indicates that a single individual is represented. Only fragments of the lower limbs and right hand were recovered. They include:

Right femur (complete)

Left femur (with two fragments of part of distal end broken postmortem)

Right tibia (proximal end and part of distal end broken postmortem)
Left tibia (proximal end broken postmortem)
Right os coxa [hip] (in 2 large fragments)
Right calcaneus (complete)
Left calcaneus (distal end broken postmortem)
Right talus (complete)
Left talus (complete)
Right fibula (in two fragments, shaft and proximal end)
Left fibula (complete but in two fragments)
Right ulna (1/3 distal end and shaft only)
Right metacarpals 1-5
2 proximal hand phalanges, side undetermined
Right navicular (medial side broken postmortem)
Right talus (complete)
Right calcaneus (complete)
Left talus (complete)
Left calcaneus (proximal end broken postmortem)
Right patella (medial half only)
Left patella (complete)

Biological Description

Sex assessment

The sex of the individual was assessed as probable male. The os coxae (hip bones) are perhaps the most reliable elements for assessment of sex due to the anatomical differences involved with childbirth. In this case, while parts of the right os coxa were broken off postmortem, the features that indicate sex from this element are all present. Features consistent with a sex assessment of male are present in this individual, such as the pubis bone lacks a ventral arc and subpubic concavity, and the medial aspect of the ischiopubic ramus is blunt (Phenice 1969). In addition, the greater sciatic notch is narrow (Buikstra and Ubelaker 1994). Anecdotally, other features that typically indicate a sex of male are present, such as large acetabulum and the relatively narrow pubis medially-laterally.

Age assessment

There are two reliable methods for aging the skeleton using features present on the ox coxae: the auricular surface aging method (Lovejoy *et al.* 1985) and the pubic symphysis aging method (Brooks and Suchey 1990). Both of these features are present in this individual. Morphological features on the auricular surface of the ilium correspond to phase 4, “uniform coarse granularity” as defined by Lovejoy *et al.* (1985). The age range for individuals in this phase is 35-39. Morphological features on the face of the pubic symphysis correspond with stage 4 using the Suchey-Brooks aging system (1990). For males, the average age in stage 4 is 35.2 years with the range being 23-57 years. Based on the ages derived from these two aging methodologies, this individual most likely was between 35-40 years at his death.

Stature assessment

The maximum length of the right femur is 45 cm, and using the stature regression formula provided by Trotter and Gleser (1952), this equates to a living stature of between 165.99 – 173.87 centimeters tall, or 65.35 – 68.45 inches tall (5’5” – 5’8”).

Ancestry assessment

In this case, an assessment of ancestry was not possible because there are no reliable methods for estimating ancestry from the recovered elements. However, as this burial was uncovered in an area known to be a burial location for British soldiers (Schroedl 2000), it is most likely that he was a white British soldier who died while serving his country at Brimstone Hill Fortress.

Pathology assessment

All of the present long bones exhibit evidence of healed and active periostitis, an infection of the periosteum, the protective tissue covering of the bone (Ortner 2003). The shafts of the tibiae, femora, and fibular fragments show lines characteristic of healed periostitis. (See Fig. 1). On the right femur, the region lateral to the greater trochanter is elevated slightly, giving an area of 6 cm by 2 cm a convex appearance. (See Figs. 2 and 3). The bone surface in this lesion displays active rapid remodeling. Radiographs taken of this element show the margin of the periosteum and a sclerotic (densely formed bone) reaction directly above it. Essentially this indicates that the bone cells (osteoblasts) were actively forming dense bone in this region as a reaction to the present infection. In addition, radiographs taken of the two tibiae reveal dense, sclerotic bone. (See Fig. 4). This is partially due to the present infection of the periosteum. However, it is likely that this individual undertook a considerable amount of physical activity as bones subjected to higher amounts of stress are denser.

The fact that this individual engaged in physical activity is further supported by the presence of osteoarthritic changes located on the 4th and 5th metacarpals of the right hand. (See Figs. 5 and 6). The area where these two bones articulate is severely remodeled, suggesting that the connective tissue attachments were inflamed perhaps from overuse, which led to direct bone-on-bone contact.

In addition, the dorsal side of the pubis displays abnormal bone growth. (See Figs. 7 and 8). Typically, this portion of the pubis has a rough surface. However, in this case, there is remodeled bone formation of 1 cm by 1 cm located in this region. The lesion was

slow forming, indicated by the smooth surface of the formed bone (Ortner 2003), and is possibly an ossified ligament.

Summary and Conclusion

BSH 4 Burial 3 represents the remains of a probable male, who was between 35 and 40 years at his death and who stood between 5'5" and 5'8" tall during life. Based on previous skeletal analyses and historical information, he was most likely a British soldier deployed at the fortress.

In addition, he had lived with a systemic bacterial infection for at least several months if not several years before his death. Periosteal reactions are non-specific, meaning that it cannot be stated with certainty as to what caused the infection (Ortner 2003). Possibilities include bacterial organisms introduced via minor or major trauma, or via infection arising in some other part of the body. There is no evidence for fracture in the present elements, however, none of these possibilities can be ruled out. What can be stated with certainty is that this individual's immune system was hardy enough to withstand the infection, as considerable bone remodeling is present, which takes time – on the order of several months to several years. The systemic periosteal infection this individual had is something he had lived with for probably several years. In the absence of antibiotic therapy, his immune system was unable to completely eliminate the invading organisms but was able to withstand the infection for a considerable period of time.

The presence of such an infection is not unusual given the historical context: antibiotic therapy for infections was not yet in use while Brimstone Hill Fortress was occupied, and health at military outposts in the Caribbean such as Brimstone Hill Fortress

during the 18th and 19th centuries is known to have been generally poor (Curtin 1989). In addition, previous analyses of skeletal remains from Brimstone Hill Fortress found similar evidence of infection (McKeown 1998). This case further adds to the emerging picture of health in deployed British soldiers serving at Brimstone Hill Fortress during the 18th and 19th centuries.

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Figures

Fig. 1. Healed periosteal reaction on midshaft left tibia, lateral side. Proximal end to right. Arrows indicate periosteal reaction.



Fig. 2. Right femur, anterior. Arrow points to area of sclerotic bone.



Fig. 3. Right femur, posterior. Arrow points to area of sclerotic bone.



Fig. 4. Radiograph of tibiae and left fibula, anterior view.

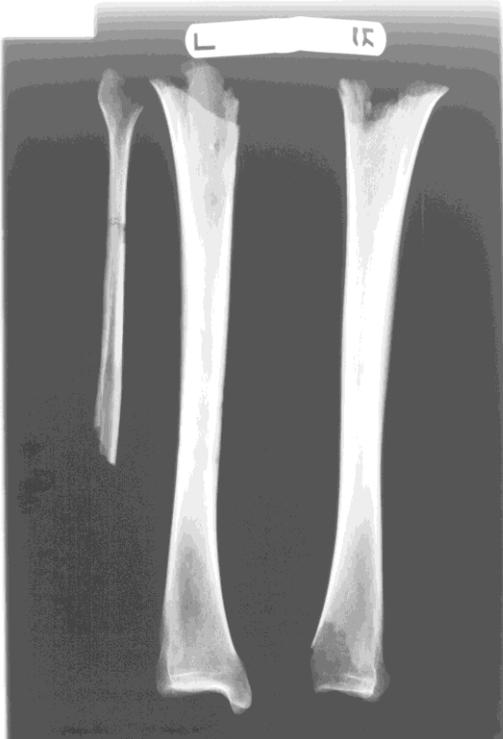


Fig. 5. Right 4th (left side photo) and 5th metacarpals, medial view. Arrows point to areas of osteoarthritis.



Fig. 6. Right side metacarpals, ventral surface. Arrows point to arthritic area where 4th and 5th metacarpals articulate.



Fig. 7. Ventral surface right pubis. Arrow points to area of bone growth.



Fig. 8. Medial surface right pubis. Arrows point to area of ventral bone growth.

