Human Skeletal Remains from Brimstone Hill Fortress National Park, St. Kitts, West Indies, 2005

Brimstone Hill Archaeological Project Report No. 27

Submitted to
The Brimstone Hill Fortress National Park Society, St. Kitts, West Indies

By

Elizabeth A. DiGangi

Department of Anthropology
University of Tennessee
Knoxville, Tennessee

June 2006

Table of Contents

List of Figures

Human Skeletal Remains from Brimstone Hill Fortress National Park, St. Kitts, West Indies, 2005

Introduction

During the installment of a utility pole at the Brimstone Hill Fortress National Park in January and February 2005, some bone fragments were uncovered by park worker Dion Lawrence. When the remains were recognized as human, they were bagged, set aside, and work was continued in a slightly different area so as not to disturb the rest of the burial. During excavations sponsored by the Brimstone Hill Fortress National Park Society, the University of Tennessee, and the National Geographic Society, in July and August of 2005, the remains were brought to the attention of the project archaeologists and a request was made to analyze them.

The utility pole construction site is located in an area below the Magazine Bastion. As excavations in 2004 at site BSH 4 located at the base of Orillon Bastion uncovered a human burial (DiGangi 2005), and it is known that other burials occur between the two bastions (Schroedl 2000), it was decided to designate these remains as BSH 4 Burial 2.

Materials

Six human cranial fragments and 1 human postcranial fragment were recovered. They include:

1 frontal bone, cut coronally into two halves
1 right complete temporal bone
1 left maxilla and zygomatic bone, with permanent canine, 1^{st} , 2^{nd} premolar, and 1^{st}, 2^{nd} molars in sockets (bone broken beyond the 2^{nd} molar – unknown if 3^{rd} present)
1 left partially complete parietal bone with coronal autopsy cut
1 left femoral epiphysis
1 cranial fragment

Description of Human Skeletal Material: Biological Profile

Analysis of the remains indicates that there is a single individual present, based on non-duplication of any of the elements. The sex of the individual is assessed as probable male. Many of the typical landmarks for sex assessment are not represented in any of the remains. The supraorbital ridge, or brow ridge, located superior to the eye orbits is one indication of sex – males typically having a more protuberant ridge and females a less protuberant one. The brow ridge on the frontal bone in this instance was unremarkable, being closer to the female type. Caution is needed here, as there is a very wide variation in the expression of such traits (Spradley and Jantz 2003).

However, the mastoid process located on the temporal bone is relatively large and protuberant (see Figures 1 and 2). In particular, the anatomy of the temporal includes a groove for a muscle attachment called the digastric groove that is inferior to the mastoid process and runs in an anterior-posterior direction. On this individual, the groove was quite wide, ranging from 1.55 – 3.22 mm in width. The digastric muscle attaches in this location, and is one of the muscles of mastication or chewing (Martini *et al* 2003). Muscle attachment sites on males tend to be much larger than they are on females, because of the greater strength of males. Even though there were no other skeletal indicators of sex present, and while the supraorbital ridge was assessed as being closer to the female type, the large nature of the mastoid and the digastric groove warrant assigning this individual as a probable male.

Age of this individual is assessed as between 14-16 years old at death. This assessment is based on the developmental stages of the maxillary second molar and the femoral epiphysis. Tooth development and eruption follow a predictable sequence, with the second molar being the second to last of the permanent teeth to develop and erupt (Hillson 1996). (Unfortunately,

the third molar, the last tooth to erupt, was not present with the remains and the maxilla was broken in this region, obscuring any evidence). Typically the second molar erupts when an individual is 12 years old (Hillson 1996). Close analysis of the tooth revealed that the ends of the root tips, or apices, were not yet completely closed. As this is the last part of the tooth to develop, it is possible to assign this individual to an age category based on known tooth development data cited in Hillson (1996). The range of time for the complete closing of the apices of the second maxillary molar is between age 14 and 16 years (Hillson 1996).

Further evidence supporting this age range is the absence of wear on any of the recovered teeth. Brothwell (1981) as cited in Hillson (1996) developed a system of aging an individual based on the wear of the permanent molars. None of the teeth present with Burial 2 show any evidence of wear, indicating that the teeth have been used less and hence point to a younger individual. According to Brothwell, 1st and 2nd permanent molars with no wear fall into the age category of 17-25 (1981). In addition, there was the presence of calculus (hardened dental plaque) on the teeth. All teeth had some calculus, with the first molar having the heaviest amount (see Figure 3). Calculus accumulation on this tooth is common, because of its location further back in the mouth, where it is difficult to clean unless a mechanical implement is utilized. However, to the author's knowledge, there are no standards for estimating age from degree of calculus deposition.

In addition, there was one carious lesion (cavity) located distally on the maxillary 1st molar, in the region where it touches the second molar (see Figure 4). While the presence/absence of caries does not directly correlate with age, the low frequency of caries in this individual (1 lesion out of 5 available teeth) is suggestive of a younger individual whose

teeth were exposed to cavity-causing foods for a shorter period of time than an older individual's teeth would have been.

The developmental stage of the femoral epiphysis was the other available element for age assessment (see Figures 5 and 6). The femoral epiphysis is the part of the femur, or thigh bone, which articulates or connects into the hip joint. The epiphysis reaches its familiar adult shape by the age of 12 (Baker *et al* 2005). Typically this part of the bone fuses to the rest of the femoral shaft between the ages of 14 and 19 (Baker *et al* 2005; Scheuer and Black 2000). According to Scheuer and Black (2000), the average age for the fusion of this element is 16 for boys. Additionally, McKern and Stewart (1957) as cited in Scheuer and Black (2000) found that 88% of femoral epiphyses were fused in boys between the ages of 17 and 18. Since the epiphysis with this individual had not yet begun to fuse, but had reached its adult shape, the age estimate for this element is 14-16, the lower side of the average fusion ages.

Based on all of the above information, Burial 2 was between 14 and 16 at his death. Both estimates from the developmental stage of the tooth roots of the second molar and the non-fusion of the femoral epiphysis place this individual as a young adolescent, 14-16 years old. While the dental wear technique placed this individual in a slightly older age range (17-25), tooth development and epiphyseal closure are more reliable methods than the dental wear technique because they are governed by the predictable and sequential biology of development rather than the variable of types of abrasive foods eaten.

Assessment of ancestry was not possible because skeletal features that can indicate ancestry were not present. However, information from previous skeletal analysis and culture history of the fortress' occupation (McKeown 1997, 1998, 1999, 2000; DiGangi 2005; Schroedl 2000) indicates that this individual most likely represents a white British soldier who

was deployed at Brimstone Hill Fortress.

Description of Human Skeletal Material: Evidence for Autopsy

Three of the cranial fragments recovered with Burial 2 show evidence of an autopsy cut (see Figures 7-11). The frontal bone is cut into two halves, with the bone sawed apart approximately 8 centimeters anterior to the coronal suture. The left parietal bone exhibits a coronal cut located anterior to the lambdoidal suture, which is not present due to breakage (see Figures 12 and 13). Hesitation marks, or marks where the saw made a false start, can be seen on this particular cut (see Figure 14). Essentially, this individual's skull was cut in two places: coronally (or left to right) at an area just above the forehead, and another coronal cut located in the mid to posterior skull region (see Figure 15). Presumably transverse cuts were also made on the sides of the skull, to remove this portion of the skullcap, although areas that would show such evidence were not recovered.

Previous evidence of an autopsy being conducted at Brimstone Hill Fortress, seen in skeletal remains excavated in 1999 - BSH 2 Burial 3 (McKeown 2000), make it unlikely that these cuts were performed for anatomical dissection. In addition, McKeown (2000) discusses the history of autopsy during the colonial period. The evidence seen here further supports the hypothesis that autopsies for the purpose of determining cause of death and not for anatomical dissection were being conducted on British soldiers deployed at Brimstone Hill Fortress.

Summary and Conclusion

BSH 4 Burial 2 represents the remains of a probable male, who was between 14 and 16 years old at his death. Based on previous skeletal analyses and historical information, it is most likely that he was a British soldier deployed at the fortress. His young age may seem unusual, but historic records indicate that the majority of British soldiers in the 19th century were under 30 years old (Curtin 1989). In addition, excavations in 1996 uncovered a single femoral epiphysis of an individual aged 10-15 years old at death (McKeown 1997). This element was uncovered in an area (BSH 2) known to hold the interments of British soldiers, so the presence of such a young soldier may not be unusual. As British records reveal that there were some soldiers stationed with their wives at the fortress, another possibility is that this individual was the child of such a soldier.

The evidence seen here for reveals that autopsies for the purpose of determining cause of death were not uncommon at Brimstone Hill Fortress during British occupation. The implication that the administration at the fortress realized the need for determining cause of death, to perhaps help prevent the living from reaching the same fate, is important and enlightening to the history and culture of Brimstone Hill Fortress and St. Kitts.

Acknowledgments

The author would like to thank Dr. Gerald Schroedl, Principal Investigator, for the opportunity to participate in this project. In addition, gratitude is extended to the government of St. Kitts and Mr. Larry Armony and the Brimstone Hill Fortress National Park Society for permission to transport the remains to the United States for analysis.

References Cited

Baker, B.J., Dupras, T.L. and M.W. Tocheri. (2005). The Osteology of Infants and Children. Texas A&M University Press: College Station.

Brothwell, D.R. (1981). Digging Up Bones, 3rd edition. Oxford University Press, London.

Curtin, P.D. (1989). Death by Migration: Europe's Encounter with the Tropical World in the Nineteenth Century. Cambridge: Cambridge University Press.

DiGangi, E.A. (2005). Human Skeletal Remains from Excavations at Brimstone Hill Fortress National Park, St. Kitts, West Indies, July-August 2004. Brimstone Hill Archaeological Project Report No. 25.

Hillson, S. (1996). Dental Anthropology. Cambridge: Cambridge University Press.

Martini, F.H., M.J. Timmons, and R.B. Tallisch. (2003). Human Anatomy, 4th edition. Upper Saddle River, NJ: Prentice Hall.

McKeown, A.H. (1997). Human Skeletal Remains from Excavations at Brimstone Hill Fortress National Park, St. Kitts, West Indies, July 1996. Brimstone Hill Archaeological Project Report No. 5.

McKeown, A.H. (1998). Human Skeletal Remains from the 1997 Excavations at Site BSH 2, Brimstone Hill Fortress National Park, St. Kitts, West Indies. Brimstone Hill Archaeological Project Report No. 8.

McKeown, A.H. (1999). Human Skeletal Remains from the 1998 Excavations at Site BSH 2, Brimstone Hill Fortress National Park, St. Kitts, West Indies. Brimstone Hill Archaeological Project Report No. 13.

McKeown, A.H. (2000). Human Skeletal Remains from Excavations at Brimstone Hill Fortress National Park, St. Kitts, West Indies, June – July 1999. Brimstone Hill Archaeological Project Report No. 20.

McKern, T. and T. Stewart (1957). Skeletal age changes in young American males: Analyzed from the Standpoint of Age Identification. Natick, MA: Environmental Protection Research Division (Quartermaster Research and Development Center, U.S. Army).

Scheuer, L and S. Black. (2000). Developmental Juvenile Osteology. San Diego: Academic Press.

Schroedl, G.F. (2000). A Report on the 1999 Archaeological Investigations at the Brimstone Hill National Park, St. Kitts, West Indies. Brimstone Hill Archaeological Project Report No. 17.

Spradley, M.K. and R.L. Jantz (2003). Skull vs. Postcranial Elements in Sex Determination. Poster presented at American Academy of Forensic Sciences Annual Meeting, Chicago, IL.

Figure 1. Right temporal bone, posterior view, arrow shows mastoid process and wide digastric groove (arrow).

Figure 2. Right temporal bone, inferior, showing mastoid process and wide digastric groove.

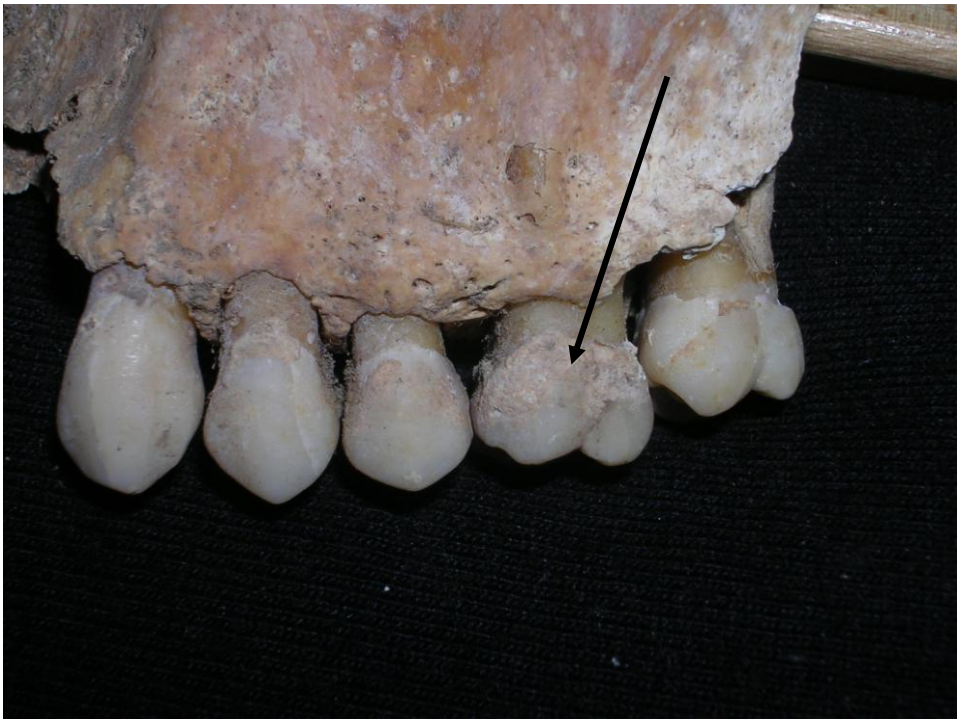

Figure 3. Maxillary teeth, *in situ*, lateral view, arrow shows calculus formation.

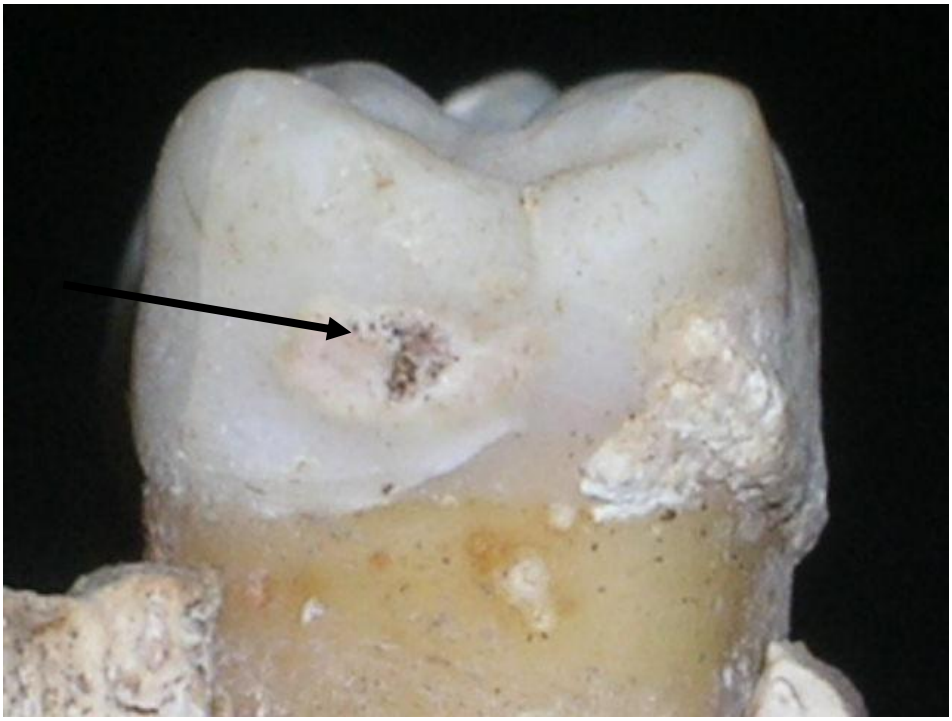

Figure 4. Maxillary second molar with distal interproximal cavity (arrow). Inferior aspect is to top of photo.

Figure 5. Femoral epiphysis, lateral view. Inferior is to bottom photo.

Figure 6. Femoral epiphysis, medial view. Inferior is to bottom photo.

Figure 7. Both halves frontal bone, anterior view.

Figure 8. Both halves frontal bone, superior view.

Figure 9. Anterior half of frontal bone, posterior view, shows autopsy cut.

Figure 10. Posterior half of frontal bone, anterior view, shows autopsy cut.

Figure 11. Close up of autopsy cut, anterior half of frontal bone, posterior view.

Figure 12. Left parietal bone, superior view, anterior toward top of photo. Broken part due to postmortem damage.

Figure 13. Left parietal bone, shows autopsy cut. Anterior is down, sagittal suture to right of photo.

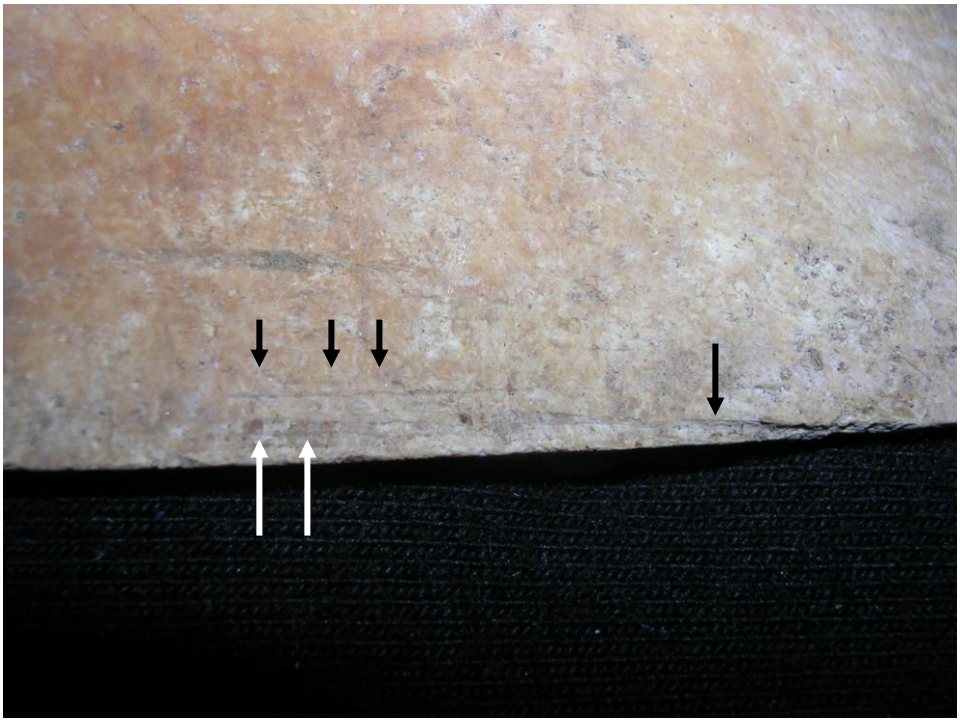

Figure 14. Posterior side of left parietal bone, note hesitation marks by autopsy cut (see arrows). Sagittal suture to right of photo.

Figure 15. Cranial fragments from Burial 2 in approximate anatomical position.