
ANALYSIS OF SKELETAL MATERIAL FROM CALICO HILL, FLORIDA: A QUESTION OF PALEOPATHOLOGY VS. TAPHONOMY

RACHEL K. SMITH

Department of Anthropology, Florida State University, Tallahassee, FL 32301
E-mail: rksofd@hotmail.com

Calico Hill is a large sand dune that stretches approximately 2 kilometers along the western bank of the Wacissa River in Jefferson County, Florida. For many years, the site has been a target for amateurs seeking ceramic and lithic remains from Native American archaeological sites. Professional excavations have yet to be undertaken, although several sites have been recorded (8JE708, 8JE186, 8JE801). The area has been extensively logged for pine stumps, which were utilized in the production of gunpowder (Dunbar, personal communication 2001). Site files obtained from the Florida Bureau of Archaeological Research report several individual mound sites within the extensive dune deposit. According to a report by Calvin Jones in September of 1988, the majority of the ceramics found among these sites consist primarily of early Weeden Island-style pottery, primarily plain and Wakulla Check Stamped sherds. Numerous other ceramic styles have been collected from the area, including Deptford, Archaic (early, middle, and late), Norwood, and Safety Harbor. Lithics found within the dune include pre-form points indicative of the Paleoindian period. According to Jones (1988) the range in style for both ceramics and lithics indicate the occupation of Calico Hill dates within the range of 10,000 years ago to circa AD 1500. Lacking provenience information, an exact date for the skeletal remains considered here is unknown.

The skeletal remains were obtained during a salvage excavation undertaken in the early 1970s. No records of the excavation have been located, thus the only information concerning provenience are the burial numbers on the storage containers. An article, by Morse et al. (1974) appeared in the *Bulletin of the New York Academy of Medicine* describing several prehistoric sites in Florida containing skeletal material exhibiting lesions indicative of multiple myeloma. The skeletal remains from Burials One and Two from Calico Hill were included among the material diagnosed with this condition, based on small, circular lesions found on the cranial material from Burial Two and the cranial and postcranial material from Burial One. However, following detailed re-analysis of the remains, this diagnosis was called into question.

Material and Methods

Both burials are extremely fragmentary. Burial One was the only burial that contained significant amounts of postcranial material. The remaining burials contained minimal amounts of fragmented skeletal material. The remains from

Burial One and Two had been repeatedly treated with Krylon following excavation (Morse et al. 1974). Following excavation and treatment, each bag was labeled with burial and bag number when multiple bags were utilized.

In October 2001, the contents of each bag were inventoried and cranial and post-cranial measurements were obtained when possible. Dental measurements, dental attrition, and sexing for the burials were scored according to Buikstra and Ubelaker (1994) and stature was calculated for Burial One according to Steele and Bramblett (1988). Lacking provenience information, it is unclear whether the individual burials were isolated from each other, since Burial One contains two atlases (C-1) and two axes (C-2). A minimum number of individuals (MNI) was calculated based on the designation of six separate burials, with an MNI of seven individuals represented within the site. The following section contains information obtained from the analysis of each burial and the descriptions of the physical remains, scored for completeness according to Steele and Bramblett (1988). The burials are labeled according to the information provided on the original storage bags.

Analysis of Burials

The following section provides a brief description of the skeletal material identified within each burial. The individual elements, as well as scores for completeness, are included in Table 1.

Burial One

Burial One contains an MNI of two based on the presence of two first and second cervical vertebrae. The majority of the remains represent a young, adult female. Sex assessment was based on morphology of the mandibular mental eminence, the greater sciatic notch, and the right mastoid process. Age was determined to be that of a young adult based on degree of closure of the ecto- and endocranial sutures. Teeth were intact and measurable.

The molars exhibit full cusp removal, with the exception of the third molars, which are only moderately worn. The remaining teeth in the maxilla exhibit full cusp removal on the molars with the exception of the third molar and moderate cusp removal of the premolars. There is no dentin exposure. The mandible contains two extra premolars that are impacted within the lingual surface of the mandible (Figure 1).

Table 1. Burial inventory.

<p>Burial 1 Maxilla, right (5) containing C, PM3, PM4, M1, M2, M3 Mandible (5) containing right I1, right I2, right C, right PM1, right PM2, right M1, right M2, right M3; left I1, left I2, left C, left PM1, left PM2, left M1, left M2, left M3; Frontal bone (4) Parietal, left (4) Parietal, right (3) Occipital (2) Petrous pyramid, left (5) Temporal, right (2) Femur, right (4) Femur, left (4) Humerus, right (4) Calcaneous, right (2) First rib, left (4) Proximal end of radius (1) Os coxae, left (2) Os coxae, right (2) 3 UID ribs – two left, one right (2)</p> <p>Burial 2 Calotte (4) Temporal, left (2) UID cranial fragments (1) Maxilla, right (2) 3 upper molars – RM1, RM2 LM1</p> <p>Burial 3 UID femur shaft (2) Mandible, left (1) containing: LM2, LM3, and a fragment of LM1 UID loose molar in heavy concretion UID skeletal fragments in heavy concretion</p>	<p>Burial 4 Parietal, left (4) Parietal, right (1) Temporal, right (2) Temporal, left (2) UID os coxae (1) Sacrum (1) Acetabulum, right (2) Tibia, right (1) Tibia, left (3)</p> <p>Burial 5 Occipital (2) Temporal, left (2) Femur, right (2) Humerus, right (1) UID os coxae (1) UID vertebra (1) UID cranial fragments (1)</p> <p>Burial 8 Frontal (2) Parietal, right (2) Occipital condyle (1) Temporal, right (4) Temporal, left (3) Maxilla (5) containing LP1, LP2, LM1, LM2, LM3, RP2, RM1, RM2 Mandible (4) containing LC, LP1, LP2, LM1, LM2, RM1, RM2 Atlas (3) Axis (3)</p> <p>Bag of Burnt Bones Head of femur, right; distal end of humerus, left; proximal end of radius; proximal end of ulna; UID vertebral fragments; UID long bone fragments.</p>
<p>NOTE: Scoring for completeness: (1) – element only represented by a few fragments: (2) – element less than half intact: (3) – approximately half the element intact: (4) – element approximately three-quarters intact: (5) – element complete.</p>	

Burial Two

Burial Two contains the remains of a young adult female. Sex assessment was based on morphology of the supra-orbital ridge/ glabella. Age was determined by ecto- and endocranial suture closures. There is full cusp removal on all molars with no dentin exposure.

Burial Three

Burial Three contains heavily concreted, fragmentary remains. The remains were embedded in hardened matrix, making detailed analysis impossible. No sex or age determination was obtained, due to the nature of the remains. Full cusp removal was exhibited on all molars present, although unable to gauge exposure of dentin due to weathering of remains. Enamel rims appear complete. Full dentin exposure was

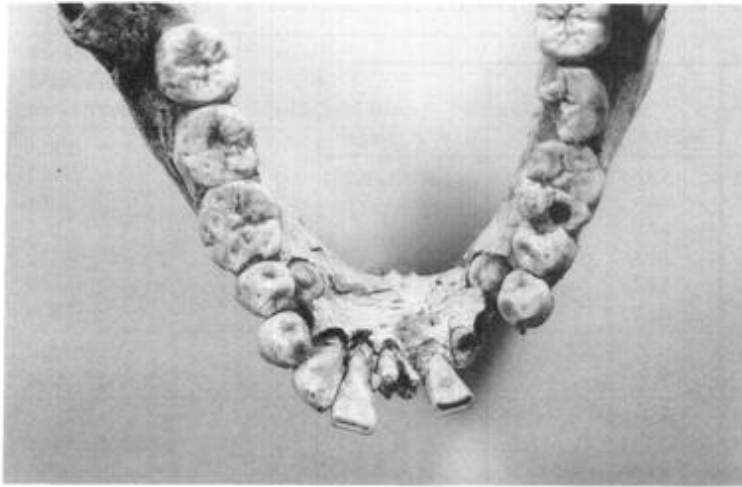


Figure 1. Mandibular supernumerary premolars from Burial One.



Figure 2. Endocranial surface of the calotte from Burial Two showing "punched out" lesions and root damage. Note roots still adhering to the vault surface.

exhibited with the enamel rim intact on the UID loose molar. Based on extreme attrition of the molar surfaces, this appears to be the remains of an older adult.

Burial Four

Burial Four contains the fragmentary remains of an adult male. Sexing was based on morphology of the mastoid processes. Age was determined based on ectocranial suture closures.

Burial Five

Burial Five contains the fragmentary remains of a single adult. Sex was ambiguous based on morphology of the mastoid process and nuchal crest.

Burial Eight

Burial Eight contains the remains of an elderly adult male. Sex assessment was based on morphology of the supra-orbital ridge/glabella and mastoid processes. Age was determined by palatine and ectocranial sutures, which showed significant closure. There is full dentin exposure with enamel rims still intact on all remaining teeth within the mandible and maxilla. Only one third molar has erupted, located within the left side of maxilla. There are multiple (two) mental foramen on the left side of the mandible.

Summary

The skeletal remains therefore represent a total of seven individuals: two young adult females from Burial One and Two, one adult male from Burial Five, one elderly male from Burial Eight, and the remaining three individuals of indeterminate sex and age. Also included with the remains from Calico Hill is a bag of burnt skeletal fragments, removed from the site at the time of excavation. There are no records of provenience for the remains, so it is unknown whether they were excavated or recovered from surface collection. Identifiable human fragments are included in Table 1. All are charred, and if not associated with the unburned burials, represent minimally an additional individual.

Table 2 provides dental measurements of the Calico Hill material. Table 3 provides comparisons of these measurements. The metrics available from Calico Hill are comparable to other dental material from prehistoric Florida sites.

Paleopathology or Taphonomy

According to Morse et al. (1974) the diagnosis of multiple myeloma was based on numerous circular lesions present on the cranial and postcranial remains of Burials One and Two.

Table 3. Comparisons of dental measurements. Blanks indicate no data. All measurements in millimeters.

	P1	P2	M1	M2	M3
Mesiodistal Diameters of the Mandible					
Burial 1	6.96	6.95	10.45	9.87	11.26
		7.19	11.04	10.19	10.53
Burial 3					12.31
Burial 8	6.99	6.59	10.36	10.84	
Average	6.97	6.91	10.61	10.30	11.36
Standard Deviation	0.02	0.30	0.36	0.49	0.89
Mesiodistal Diameters of the Maxilla					
Burial 1		6.71		9.13	9.53
Burial 2					9.94
Burial 8	6.61	6.51	11.23	9.55	9.82
		7.25		9.29	
Average		6.82	11.23	9.32	9.76
Standard Deviation		0.38		0.21	0.21
Buccolingual Diameters of the Mandible					
Burial 1	7.42	7.99	10.95	9.22	10.39
	7.37	7.88	11.00	10.38	10.04
Burial 3				11.74	10.45
Burial 8	8.66	9.44	11.89	10.93	11.77
				12.19	
Average	7.81	8.43	11.28	10.89	10.66
Standard Deviation	0.73	0.87	0.52	1.16	0.76
Buccolingual Diameters of the Maxilla					
Burial 1		9.14			10.71
Burial 2			11.64		11.69
Burial 8	10.04	9.32		12.03	9.34
Average		9.23			10.58
Standard Deviation		0.12			1.18

analysis, the skeletal remains from Calico Hill provide additional information about the early inhabitants of northern Florida.

Acknowledgments

I wish to thank the following people: Dr. Glen Doran, for suggesting the analysis of the Calico Hill remains and for his continued support; Dr. Chris Stojanowski, for his guidance and assistance throughout the analysis; Dr. Dave Dickel, for his assistance in analysis and for providing comparative material; Dr. Anthony Falsetti, for his assistance and profes-

sional opinion; and Jim Dunbar, for always being so generous with his time and information.

References Cited

- Aufderheide, Arthur C. and Conrad Rodriguez-Martin
1998 *The Cambridge Encyclopedia of Human Paleopathology*. Cambridge University Press, Cambridge.
- Buikstra, Jane E., and Douglas H. Ubelaker (editors)
1994 *Standards for Data Collection from Human Skeletal Remains*. Arkansas Archeological Survey Research

Table 2. Dental measurements, continued.

Burial 8 Mandibular measurements	Mesiodistal Diam.	Buccolingual Diam.	Crown Height
LM2	10.84	10.93	
LM1	10.36	11.89	
LP2	6.59	9.44	
LP1	6.99	8.66	
LC	6.83	8.18	
RM3		11.77	
RM2		12.19	
Maxillary measurements			
LM3	9.82	9.34	
LM2	9.55	12.03	
LP2	6.51	9.32	
LP1	6.61	10.04	
RP2	7.25		
RM1	11.23		
RM2	9.29		

completely lytic dissolution of bone without reactive new bone formation (Aufderheide and Rodriguez-Martin 1998:352). Although the appearance of the lesions on the remains from Burials One and Two meet this criterion, the other diagnostic factors associated with multiple myeloma argue against it. The tumor is rarely found in individuals below the age of 40 years and, in fact, 90% of cases are found in individuals between the ages of 50 and 60 years of age (Roberts et al. 1995). Close to 98% of patients with multiple myeloma are older than 40 years of age, with a peak incidence in the seventh decade (Mirra 1989). There is a great prevalence of males over females (Ortner and Putschar 1981:264). Authorities suggest that more than 70% of all cases of multiple myeloma affect males (Reichs 1986). According to a US National Cancer Survey, the rate of incidence of multiple myeloma was two to three in 100,000 in 1973 and appears to be on the increase (Webb 1995).

The diagnostic criteria of multiple myeloma make this diagnosis highly questionable. The sex and age of the remains indicate these would be considered rare cases, and the probability of finding two rare cases of this disease within one burial site is very low.

The remains were taken to The C.A. Pound Lab at the University of Florida to be examined by Dr. Anthony Falsetti, as well as to the Florida Bureau of Archaeological Research, where they were examined by Dr. Dave Dickel. Falsetti and Dickel both confirmed a diagnosis of taphonomy due to root boring. Dickel was able to produce a cranium from his collections that exhibited the same type of lesions as those seen

on the Calico Hill remains, as well as a cranium displaying extensive root damage, with roots still in place, protruding through the vault wall. The margins of the lesions of all of these cases appear identical.

Conclusion

Calico Hill represents a Native American site in northern Florida that spans several cultural phases. The lithics and ceramics recovered from the site indicate that early Floridians were living and hunting along the shores of the Wacissa River for an extensive period of time, although whether the site was a permanent settlement or one of seasonal use is unknown. Calico Hill also represents the type of case regularly encountered by anthropologists: remains lacking provenience, artifacts of extensive temporal designation, and poorly preserved remains.

Calico Hill is a prime example of the importance of maintaining collections so as information and diagnostic tools improve over time remains from earlier excavations may be re-examined and earlier diagnoses re-evaluated. With the reburial of skeletal remains, the possibility of reinterpretation is lost and the ability for additional analysis is impossible. Calvin Jones' brief site survey of Calico Hill described the topography, artifacts recovered, and the damage inflicted by commercial logging and amateur excavators. Only through more extensive investigation will additional chronological, cultural, and behavioral information be obtained. In spite of poor preservation and the sparse data obtained from their

Table 3. Comparisons of dental measurements. Blanks indicate no data. All measurements in millimeters.

	P1	P2	M1	M2	M3
Mesiodistal Diameters of the Mandible					
Burial 1	6.96	6.95	10.45	9.87	11.26
		7.19	11.04	10.19	10.53
Burial 3					12.31
Burial 8	6.99	6.59	10.36	10.84	
Average	6.97	6.91	10.61	10.30	11.36
Standard Deviation	0.02	0.30	0.36	0.49	0.89
Mesiodistal Diameters of the Maxilla					
Burial 1		6.71		9.13	9.53
Burial 2					9.94
Burial 8	6.61	6.51	11.23	9.55	9.82
		7.25		9.29	
Average		6.82	11.23	9.32	9.76
Standard Deviation		0.38		0.21	0.21
Buccolingual Diameters of the Mandible					
Burial 1	7.42	7.99	10.95	9.22	10.39
	7.37	7.88	11.00	10.38	10.04
Burial 3				11.74	10.45
Burial 8	8.66	9.44	11.89	10.93	11.77
				12.19	
Average	7.81	8.43	11.28	10.89	10.66
Standard Deviation	0.73	0.87	0.52	1.16	0.76
Buccolingual Diameters of the Maxilla					
Burial 1		9.14			10.71
Burial 2			11.64		11.69
Burial 8	10.04	9.32		12.03	9.34
Average		9.23			10.58
Standard Deviation		0.12			1.18

analysis, the skeletal remains from Calico Hill provide additional information about the early inhabitants of northern Florida.

Acknowledgments

I wish to thank the following people: Dr. Glen Doran, for suggesting the analysis of the Calico Hill remains and for his continued support; Dr. Chris Stojanowski, for his guidance and assistance throughout the analysis; Dr. Dave Dickel, for his assistance in analysis and for providing comparative material; Dr. Anthony Falsetti, for his assistance and profes-

sional opinion; and Jim Dunbar, for always being so generous with his time and information.

References Cited

- Aufderheide, Arthur C. and Conrad Rodriguez-Martin
1998 *The Cambridge Encyclopedia of Human Paleopathology*. Cambridge University Press, Cambridge.
- Buikstra, Jane E., and Douglas H. Ubelaker (editors)
1994 *Standards for Data Collection from Human Skeletal Remains*. Arkansas Archeological Survey Research

Series no. 44, Fayetteville.

Jones, Calvin

- 1988 *Survey of Two Large Weeden Island Sites on Calico Hill in Jefferson County, Florida*. Unpublished report on file, Florida Bureau of Archaeological Research (8JE186).

Milanich, Jerald T.

- 1994 *Archaeology of Precolumbian Florida*. University Press of Florida, Gainesville.

Mirra, Joseph M. L.

- 1989 *Bone Tumors: Clinical, Radiologic, and Pathologic Correlations*. Lea & Febiger, Philadelphia.

Morse, Dan, R.C. Dailey, and Jennings Bunn

- 1974 Prehistoric Multiple Myeloma. *Bulletin of New York Academy of Medicine* 50 (4):447-458.

Ortner, Donald J., and Walter G.J. Putschar

- 1981 *Identification of Pathological Conditions in Human Skeletal Remains*. Smithsonian Contributions to Anthropology no. 28, Smithsonian Institution Press, Washington.

Roberts, Charlotte, and Keith Manchester

- 1995 *The Archaeology of Disease*. Cornell University Press, Ithaca.

Webb, Stephen

- 1995 *Palaeopathology of Aboriginal Australians: Health and Disease across a Hunter-gatherer Continent*. Cambridge University Press, Cambridge.

