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MATERIAL EVIDENCE REPORT: CIL 1995-114-A-01 Through 06

JPAC CENTRAL IDENTIFICATION LABORATORY

13 September 2011

BACKGROUND

The REFNO 2003 case involves the 15 May 1975 loss of 13 U.S. service members aboard a CH-53 helicopter shot down at Tang Island (Koh), Cambodia during a mission to rescue captured seamen from the U.S. merchant ship S.S. *Mayaguez*. From 1991 through 2008 a succession of unilateral turnovers, site investigations, and search and recovery operations were conducted by Joint U.S./State of Cambodia (S.O.C.) and subsequent U.S./Kingdom of Cambodia (K.O.C.) teams.

MATERIAL EVIDENCE

The material evidence designated CIL 1995-114-A-01 through 06 was cleaned of adhering sediments with tap water and a soft bristle brush. Material evidence was measured with a Control Company® digital caliper and a Lufkin® Executive Thinline tape measure. The mass of each item was determined with an Ohaus Scout II® digital readout scale, or, for larger items, the Thermo Shandon® suspension scale. A Nikon® fiber optic illuminator provided magnification to read the CIL 1995-114-A-04 coins. The items discussed herein were separated by general provenience or unilateral turnover status (Table 1). After analyses the material evidence was placed in new plastic storage bags and labeled externally and internally with the pertinent information, then re-sealed with evidence tape and returned to the secured CIL storage facility.

Table 1. Consolidated list of material evidence, CIL 1995-114-A.

Consolidated Accession Number (CIL)	Original Accession Number	Provenience	Material Evidence	n =	Figure(s)
1995-114-A-01	CILHI 1992-006	Unilateral turnover	Tag, Identification, Personnel M-1940 (JACQUES) and Beaded Necklace Fragment	2	1
1995-114-A-02	CILHI 1995-009	Unilateral turnover	ZIPPO® Cigarette Lighter	1	2 - 4
1995-114-A-03	CILHI 1995-114	CILHI offshore recovery	U.S.M.C. Private First Class Rank Insignia	1	5
1995-114-A-04	CILHI 1995-114	CILHI offshore recovery	Coins	5	6 - 7

Table 1. Consolidated list of material evidence, CIL 1995-114-A.					
Consolidated Accession Number (CIL)	**Original Accession Number**	**Provenience**	**Material Evidence**	**n =**	**Figure(s)**
1995-114-A-05	CILHI 1995-114	CILHI offshore recovery	Possible Magnetic Game piece	1	8
1995-114-A-06	CIL 2008-021	Unilateral Turnover	Possible U.S.M.C. M-1955 Flak Vest 3rd pattern	1	9 - 12

CIL 1994-114-A-01 Tag, Identification, Personnel M-1940 (JACQUES) and Beaded Necklace Fragment **n = 2**

This accession includes a Type M-1940 Identification Tag (Batens 2002) and a fragment of beaded suspension necklace. The tag contains the following information (Figure 1):

JACQUES	*Service member*
J.J.	
(b)(6)	*Service number and Blood type "B"*
USMC M	*Branch of Service and gas mask size "M" (medium)*
CHRISTIAN	*Religion*

Figure 1. CIL 1995-114-A-01, Tag, Identification, Personnel M-1940 (JACQUES) and Beaded Necklace Fragment. Scale in cm.

The identification tag is manufactured from a silver-colored metal. The metal is in good condition with minor corrosion present on the reverse surface. During manufacturing sharp metal edges were eliminated on the tag rims and chain suspension hole by machine swedging that form a protective bead or rim. The tag is 50.9 mm in length, 28.5 mm wide, 1.1 mm thick, and has a mass of 4.4 g. The chain suspension hole is 3.3 mm in diameter. The beaded necklace fragment is 83.9 mm long, 2.4 mm think, and has a mass of 0.8 g.

CIL 1995-114-A-02 ZIPPO® Cigarette Lighter n = 1

This cigarette lighter was manufactured by the ZIPPO® Company of Bradford, Pennsylvania (Figure 2). The eight right-slanted hash marks on the bottom surface are the ZIPPO® lighter identification code establishing 1974 as the year it was manufactured (Figures 2 and 3) (Fiorella 1998:15). There are no personalized inscriptions or symbols on any of the lighter surfaces (Figure 4).

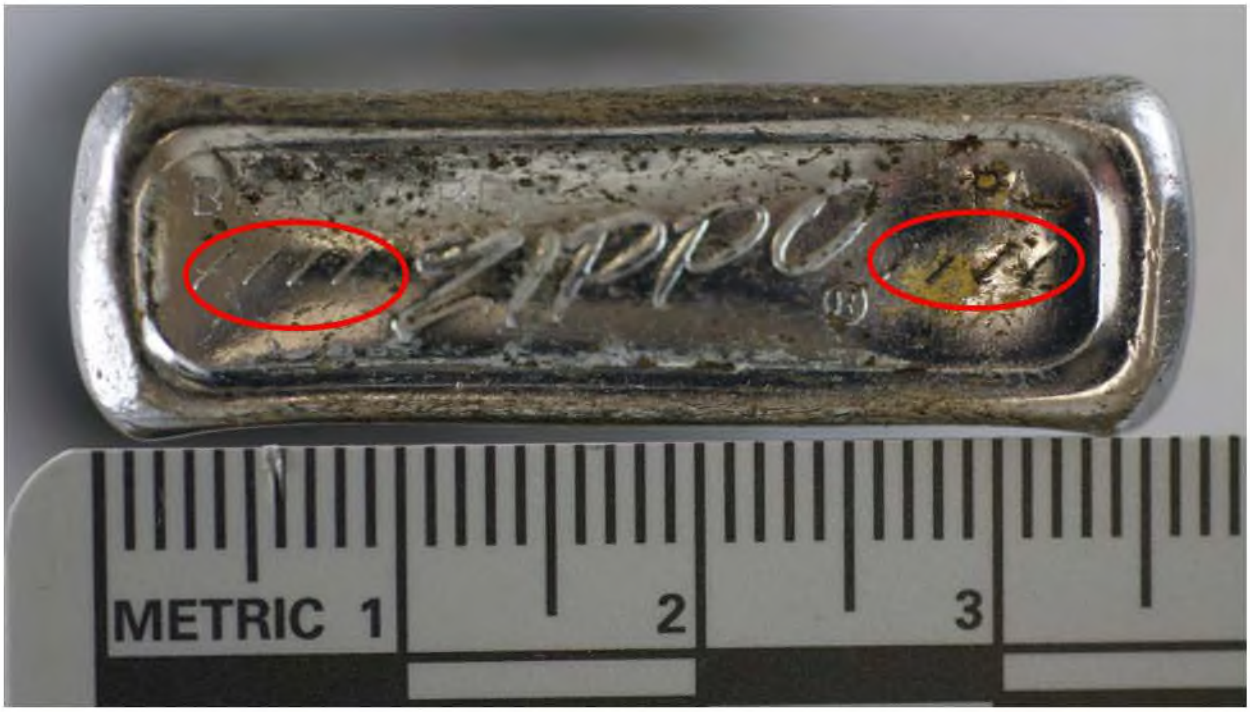
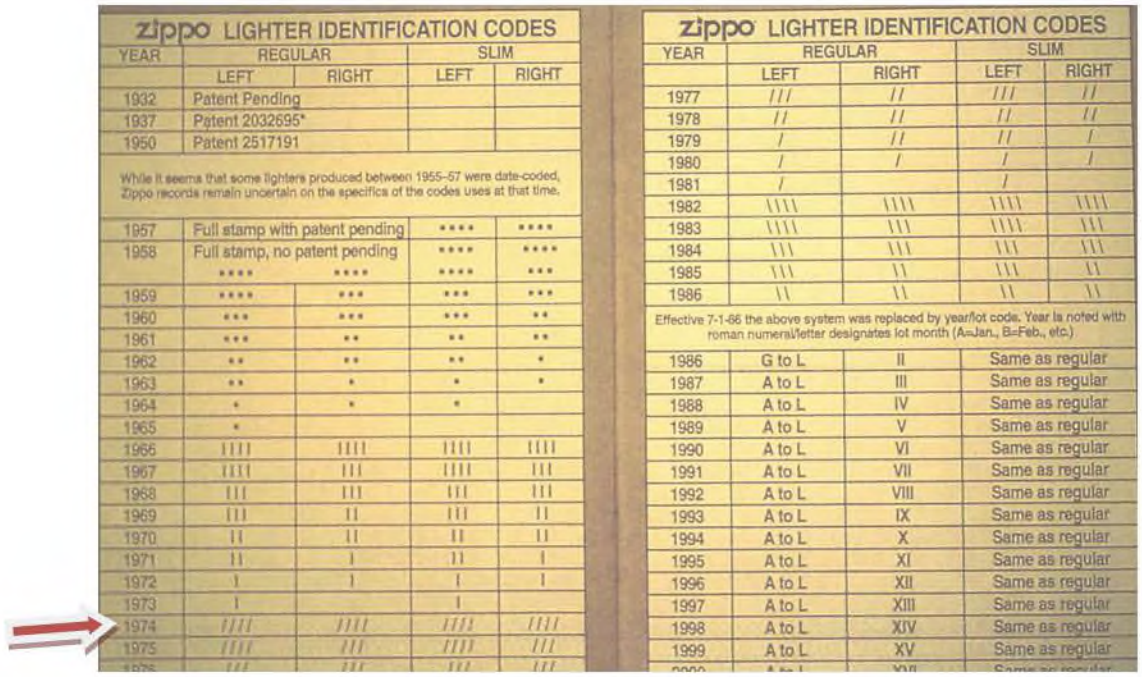


Figure 2. CIL 1995-114-A-02, ZIPPO® cigarette lighter manufacturing information. The eight right-slanted hash marks (circled in red) provide a year of manufacture. Scale in cm.



zippo LIGHTER IDENTIFICATION CODES

YEAR	REGULAR		SLIM	
	LEFT	RIGHT	LEFT	RIGHT
1932	Patent Pending			
1937	Patent 2032695*			
1950	Patent 2517191			
While it seems that some lighters produced between 1955–57 were date-coded, Zippo records remain uncertain on the specifics of the codes uses at that time.				
1957	Full stamp with patent pending		****	****
1958	Full stamp, no patent pending		****	****
	****	****	****	***
1959	****	***	***	***
1960	***	***	***	**
1961	***	**	**	**
1962	**	**	**	*
1963	**	*	*	*
1964	*	*	*	
1965	*			
1966	IIII	IIII	IIII	IIII
1967	IIII	III	IIII	III
1968	III	III	III	III
1969	III	II	III	II
1970	II	II	II	II
1971	II	I	II	I
1972	I	I	I	I
1973	I		I	
1974	////	////	////	////
1975	////	///	////	///

zippo LIGHTER IDENTIFICATION CODES

YEAR	REGULAR		SLIM	
	LEFT	RIGHT	LEFT	RIGHT
1977	///	//	///	//
1978	//	//	//	//
1979	/	//	//	/
1980	/	/	/	/
1981	/		/	
1982	\\\\	\\\\	\\\\	\\\\
1983	\\\\	\\\	\\\\	\\\
1984	\\\	\\\	\\\	\\\
1985	\\\	\\	\\\	\\
1986	\\	\\	\\	\\
Effective 7-1-86 the above system was replaced by year/lot code. Year is noted with roman numeral/letter designates lot month (A=Jan., B=Feb., etc.)				
1986	G to L	II	Same as regular	
1987	A to L	III	Same as regular	
1988	A to L	IV	Same as regular	
1989	A to L	V	Same as regular	
1990	A to L	VI	Same as regular	
1991	A to L	VII	Same as regular	
1992	A to L	VIII	Same as regular	
1993	A to L	IX	Same as regular	
1994	A to L	X	Same as regular	
1995	A to L	XI	Same as regular	
1996	A to L	XII	Same as regular	
1997	A to L	XIII	Same as regular	
1998	A to L	XIV	Same as regular	
1999	A to L	XV	Same as regular	

Figure 3. CIL 1995-114-A-02, ZIPPO® Lighter Identification Codes (Fiorella 1998:15). The symbols "//// ////" on the lighter bottom indicate that it was manufactured in 1974.

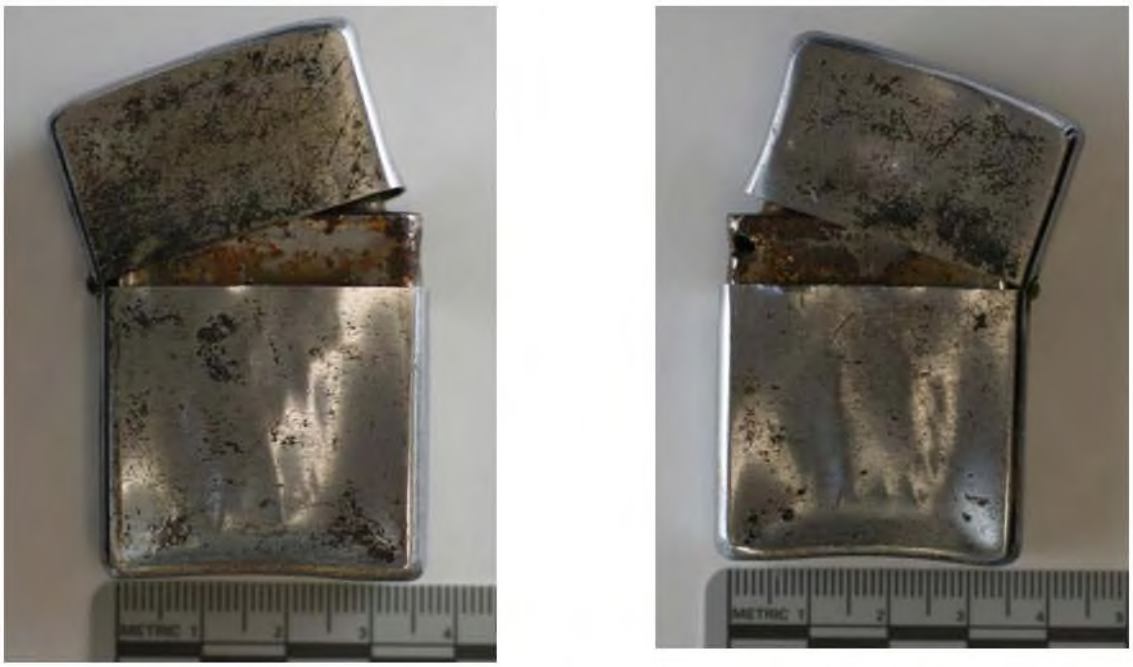


Figure 4. CIL 1995-114-A-02, ZIPPO® cigarette lighter, left and right side views. Scale is in cm.

The front and rear surfaces have been crushed inward as has the front of the flip-top lid. The metal is in good condition with a minor amount of corrosion by-product and scratching present. The cigarette lighter is approximately 55.0 mm long (lid corroded open), 38.7 mm wide, 12.2 mm thick, and has a mass of 53.1 g.

CIL 1995-114-A-03 U.S.M.C. Private First Class Rank Insignia n = 1

The CIL 1995-114-A-03 accession is a U.S.M.C. Private First Class rank insignia typically worn on a uniform collar (Figure 5). The single metal chevron has two stick pins soldered to the reverse surface. One of the pins is bent downward. This pin held the single retaining clasp included in the accession. Originally, two clasps held the insignia but one is missing. The insignia with clasp is 22.9 mm wide, 13.7 mm high, 1.3 mm thick, and has a mass of 1.8 g (with clasp).

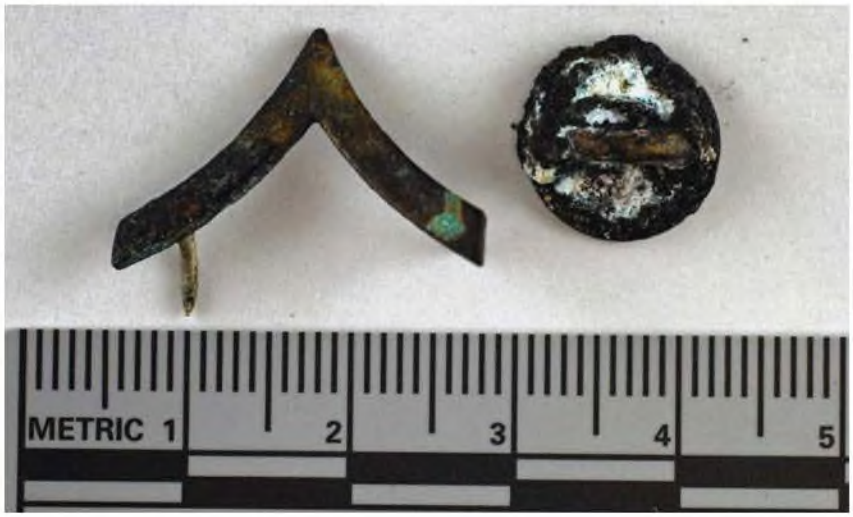


Figure 5. CIL 1995-114-A-03, U.S.M.C. Private First Class rank insignia with pin clasp. Scale is in cm.

CIL 1995-114-A-04 Coins n = 5

This accession is composed of four U.S. coins and one Japanese coin (Figure 6). The U.S. coins display significant degradation probably attributable to exposure to corrosive environmental elements (ocean saltwater). The U.S. quarter is silver-colored and dated 1966. The U.S. dime is silver-colored and dated 1970. There are also two copper-colored U.S. pennies in the accession. Both coins are so significantly corroded that much of the text and symbols are barely distinguishable or are completely obliterated. Under magnification neither coin displays a minting date. The Japanese coin in the accession (Figure 7) matches the 10 Yen piece described in Krause and Mishler (1986: 1593). This coin is in comparatively good condition with all characters and symbols legible. The Japanese symbols were not deciphered for this analysis.

Figure 6. CIL 1994-114-A-04, U.S. coins: 1966 Quarter (top left), 1970 Dime (top right), and Pennies (bottom) on which minting dates are not legible. Scale is in cm.

Figure 7. CIL 1994-114-A-04, Japanese 10 Yen coin, obverse (left) and reverse (right). Scale is in cm.

The U.S. quarter is 24.1 mm in diameter, 1.55 mm thick, and has a mass of 4.4 g. The U.S. dime is 17.3 mm in diameter, 1.1 mm thick, and has a mass of 1.6 g. The two U.S. pennies are 18.5 mm in diameter, 1.2 mm thick, with a mass of 1.9 g and 2.0 g. The Japanese 10 Yen coin is 23.5 mm in diameter, 1.4 mm thick, and has a mass of 4.1 g.

CIL 1995-114-A-05 **Possible Magnetic Game Piece** **n = 1**

The CIL 1995-114-A-05 accession is a single white-colored, plastic-like piece that may have been part of a board game (Figure 8). The bottom of the piece is weighted by a metal insert that is magnetic when placed on a metal surface. This piece resembles a small chess game object (i.e., pawn). The piece is 15.8 mm long, 9.6 mm wide at the base, and has a mass of 0.7 g.

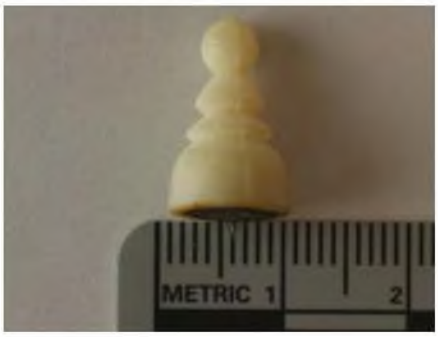


Figure 8. CIL 1995-114-A-05, possible magnetic game piece. Scale is in cm.

CIL 1995-114-A-06 Possible U.S.M.C. M-1955 Flak Vest 3rd Pattern n = 4

The CIL 1995-114-A-06 accession is composed of a flak vest and three sections of fabric-covered ballistic armor plates (Figures 9 and 10) manufactured from a composite resin material. The vest is similar in appearance and characteristics to the 3rd pattern variation of the U.S.M.C. M-1955 flak vest (Figures 11 and 12).

The fabric on the flak vest exterior is very weathered, and the original dye color has faded to a light blue-green color. There are handwritten, indelible ink characters in two locations on the vest. On the exterior left front of the vest is the number "1". On the interior center of the vest is the number "1106" above "?B" (Figure 9). A review of the REFNO 2003 records for individuals listed as unaccounted-for failed to identify a relationship between the handwritten characters and a missing individual.

Samples of two different concave-shaped ballistic armor plate manufactures are identified in this accession. They are:

M00150-70-C-0193 11/24/69
WESTINGHOUSE ELECTRIC CORP.
LOT NO. 9

and,

19 NOV. 67 LOT# 97 29 NO
0434 --- -M00150-68-C-0434
NT -- KOPPERS SAUGUS PLANT

The manufacturing dates are 1969 and 1967. The Westinghouse 1969 manufactured plate is covered in fabric that is identical in appearance to the fabric found on the CIL 1995-114-A-06 flak vest; while the 1967 dated plate is covered in a fabric that is different in appearance. It is therefore reasonable to assume that some of the fabric-covered plate sections in the accession are associated with a different flak vests. The flak vest is 550.0 mm tall, 460.0 mm wide, and has a mass of 1.81 kg. The individual concave-shaped, ballistic armor plates without fabric casings are 133.0 mm long, 133.0 mm wide, 3.1 mm thick, and have a mass of 104.7 g. The mass of all ballistic armor plates within fabric casings is 2.12 kg.

Figure 9. CIL 1995-114-A-06, possible U.S.M.C. M-1955 Flak Vest 3rd Pattern. Scale is in decimeters.

Figure 10. CIL 1995-114-A-06, fabric covered ballistic armor plates. Scale is in decimeters.

Figure 11. Exemplar photographs of the 1st, 2nd, and 3rd M-1955 Flak Vest patterns. The CIL 1995-114-A-06 accession is nearly identical to the 3rd pattern (right) (USMC Body Armor / Flak Vests, www.usmc.cz/armor.html).

Figure 12. Exemplar photograph for the M-1955 Flak Vest 3rd Pattern. This exemplar closely resembles the CIL 1995-114-A-06 flak vest accession (M-1955 Flak Vest 3rd pattern vietnamgear.com/kit.aspx?kit=28).

FINDINGS

The personal information contained on identification tag CIL 1995-114-A-01 is "JACQUES J. J.", service number "524 84 79 25", and branch of service "USMC". This information correlates directly to PFC James Joseph Jacques (DD FORM 1300 [REPORT OF CASUALTY] labeled *JACQUES JAMES JOSEPH*, dtd *23 MAY 1975*) who was one of 13 unaccounted-for servicemen associated with REFNO 2003.

Items within the accession that provide a *terminus post quem* for the 1975 REFNO 2003 loss incident include the CIL 1995-114-A-02 Zippo® cigarette lighter manufactured in 1974, the CIL

1995-114-A-04 U.S. quarter dated 1966 and U.S. dime dated 1970, and the CIL 1995-114-A-06 ballistic armor plates dated 1969 and 1967.

The CIL 1995-114-A-02 identification tag is correlated to a U.S. service member aboard the REFNO 2003 aircraft. The remainder of the CIL 1995-114-A accession represents equipment, or components thereof, which were commonly issued to, or in the possession of, U.S. military personnel during the Vietnam War, but they cannot be associated with a specific individual.

(b)(6)

Anthropologist

REFERENCES

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M-1955 Flak Vest 3rd pattern. Electronic Document.
2005 – 2011 M-1955 Flak Vest 3rd pattern, http://www.vietnamgear.com/kit.aspx?kit=28.

USMC Body Armor / Flak Vests. Electronic Document.
N/D USMC & USN REENACTORS ASSOCIATION, http://www.usmc.cz/armor.html, accessed 30 August 2011.

FORENSIC ANTHROPOLOGY REPORT: CIL 1995-114-X-07

JPAC CENTRAL IDENTIFICATION LABORATORY

9 September 2011

RESULTS OF ANALYSIS

The skeletal remains designated CIL 1995-114-X-07 are the additional portions segregated from a larger group of osseous remains by mitochondrial DNA (mtDNA) sequencing data. The skeletal inventory present includes a left tibia, the left 1st rib, a left unseriated rib shaft, remnant osseous fragments that were not consumed during DNA analysis, and approximately 5.0 g of bone dust and sand grains (Figure 1). All elements were sampled for mtDNA analysis.

Due to the paucity and condition of remains present, few biological profile estimations are possible. The remains are human in origin and represent one individual as there is no duplication of skeletal elements, and the elements present have a shared mtDNA sequence. The tibia has postmortem damage on the epiphyseal ends; however, the proximal epiphysis portion that is present appears to be completely fused, giving an age estimate at 17 years or older (McKern and Stewart 1957). Additionally, the left 1st rib head appears completely fused which would provide an age estimate of 18 years or greater (McKern and Stewart 1957). Assessments of sex and race, as well as an estimation of stature, are not possible.

The remains are in fair to poor condition, and there is visible postmortem damage as evidenced by the differential coloration along post-mortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978). There is rust-colored staining on all of the elements, and the tibia has additional dark brown staining. All stains are of unknown etiology. Additionally, there are very fine sand granules in the trabeculae and medullary cavities of the fragments. No other biological determinations are made regarding CIL 1995-114-X-07.

(b)(6)

Anthropologist

Figure 1. Skeletal remains, CIL 1995-114-X-07. Scale is in dm.

REFERENCES

Behrensmeyer, A. K.
1978 Taphonomic and ecologic information from bone weathering. *Palaeobiology* 4:150-162.

McKern, T. W. and T. D. Stewart
1957 *Skeletal Age Changes in Young American Males*. Quartermaster Research and Development Command Technical Report EP-45, Natick, MA.

Ubelaker, D. H. and B. J. Adams
1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-513.

FORENSIC ANTHROPOLOGY REPORT: CIL 1995-114-X-06

JPAC CENTRAL IDENTIFICATION LABORATORY

9 September 2011

RESULTS OF ANALYSIS

The skeletal remains designated CIL 1995-114-X-06 are the additional portions segregated from a larger group of osseous remains by mitochondrial DNA (mtDNA) sequencing data. The skeletal inventory present includes fragments of an unsided humerus, a right petrous portion of the temporal bone, one unseriated thoracic vertebra, one left rib (probably #2 or #3), a right first metatarsal (Figure 1), and additional osseous fragments that were not consumed during DNA analysis. All elements were sampled for mtDNA analysis.

Due to the paucity and condition of remains present, few biological profile estimations are possible. The remains are human in origin and represent one individual as there is no duplication of skeletal elements, and the elements present have a shared mtDNA sequence. The remains are consistent in size with an adult. Assessments of sex and race, as well as an estimation of stature, are not possible.

The remains are in fair to poor condition, and there is visible postmortem damage as evidenced by the differential coloration along post-mortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978). The humerus, thoracic vertebra and rib have evidence of rust-color staining present with unknown etiology. Additionally, there are very fine sand granules in the trabeculae and medullary cavities of the fragments. No other biological determinations are made regarding CIL 1995-114-X-06.

(b)(6)

Anthropologist

Figure 1. Skeletal remains, CIL 1995-114-X-06. Scale is in dm.

REFERENCES

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1978 Taphonomic and ecologic information from bone weathering. *Palaeobiology* 4:150-162.

Ubelaker, D. H. and B. J. Adams

1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-513.

FORENSIC ODONTOLOGY REPORT:
CIL 1995-114-X-05

JPAC CENTRAL IDENTIFICATION LABORATORY

4 November 2010

DENTAL REMAIN

The dental remain of CIL 1995-114-X-05 consists of a single unrestored tooth #1 in good condition. The tooth has a white-bleached appearance and was submitted for mitochondrial DNA (mtDNA) analysis yielding a specific sequence. This tooth was reconstructed with dental wax. Photographs (Figure 1) and digital radiographs were taken of the dental remain.

Figure 1. CIL 1995-114-X-05 dental remain tooth #1; facial view (left) and occlusal view (right). The scales are in centimeters.

ANTEMORTEM DENTAL INFORMATION

This incident involves the loss of an aircraft in Southeast Asia. The available antemortem dental evidence for the associated casualty, Private First Class (PFC) Lynn [NMI] BLESSING, consists of:

1. Photocopy of the front and reverse side of Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *BLESSING Lynn*, dated *07 AUG 1974*. The form is signed by a medical officer.

COMPARISON

Comparison of the dental remain of CIL 1995-114-X-05 to the available antemortem dental evidence of PFC BLESSING reveals concordance with unrestored tooth #1 and no discrepancy (Table 1). The antemortem dental evidence of PFC BLESSING consists of a single medical examination form containing a dental chart which lists no unique characteristics, such as missing teeth or dental restorations upon which to base a comparison therefore, the strength of the single concordance with unrestored tooth #1 is lessened.

Table 1. CIL 1995-114-X-05 antemortem and postmortem comparison table.

Tooth #	PFC BLESSING	CIL 1995-114-X-05
1	V	V

Key: Green shade = concordance or possible dental match; V = unrestored.

Thirteen individuals are associated with this incident and when compared to the postmortem remains, twelve casualties cannot be excluded as a possible dental match to CIL 1995-114-X-05.

OPINION

Comparison of the postmortem remain of CIL 1995-114-X-05 to the available antemortem evidence of PFC BLESSING yields a single concordant point involving unrestored tooth #1. As there is not a discrepancy in the comparison, yet twelve other casualties cannot be excluded as a possible dental match, it is my opinion that the dental remain of CIL 1995-114-X-05 is possibly that of:

Private First Class Lynn [NMI] *BLESSING,* (b)(6) *U. S. Marine Corps.*

(b)(6)

Odontologist

FORENSIC ANTHROPOLOGY REPORT:
CIL 1995-114-X-05

JPAC CENTRAL IDENTIFICATION LABORATORY

9 March 2011

RESULTS OF ANALYSIS

The skeletal remains designated CIL 1995-114-X-05 are additional portions segregated from a larger group of osseous materials by mitochondrial DNA (mtDNA) sequencing data. The skeletal inventory present includes one tooth, with two tubes containing associated remnant grounded and powdered materials (see Forensic Odontology Report: CIL 1995-114-X-05), a fragmentary thoracic vertebra, a left rib, and a diaphysis from the left tibia (Figures 1 and 2). Osseous fragments that were not consumed during DNA analysis were returned and are included in Figure 1 associated with their parent elements. All osseous elements were sampled for mtDNA analysis.

The remains are human in origin and represent one individual as there is no duplication of skeletal elements, and the elements have a shared mtDNA sequence. Due to the paucity and condition of remains present, limited biological profile estimations are possible. The remains are consistent in size with an adult. Assessments of sex and race, as well as estimation of stature, are not possible.

The remains are in good to fair condition. There is visible postmortem damage in all the elements in the assemblage, and this is evidenced by differential coloration along postmortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978). Differential staining (i.e., green, rust, black/brown, and white) is observed on the tibia, but the etiology for this is unknown. Additionally, there are very fine sand granules found within the trabeculae and medullary cavities of the fragments. No other biological determinations are made regarding CIL 1995-114-X-05.

(b)(6)

Anthropologist

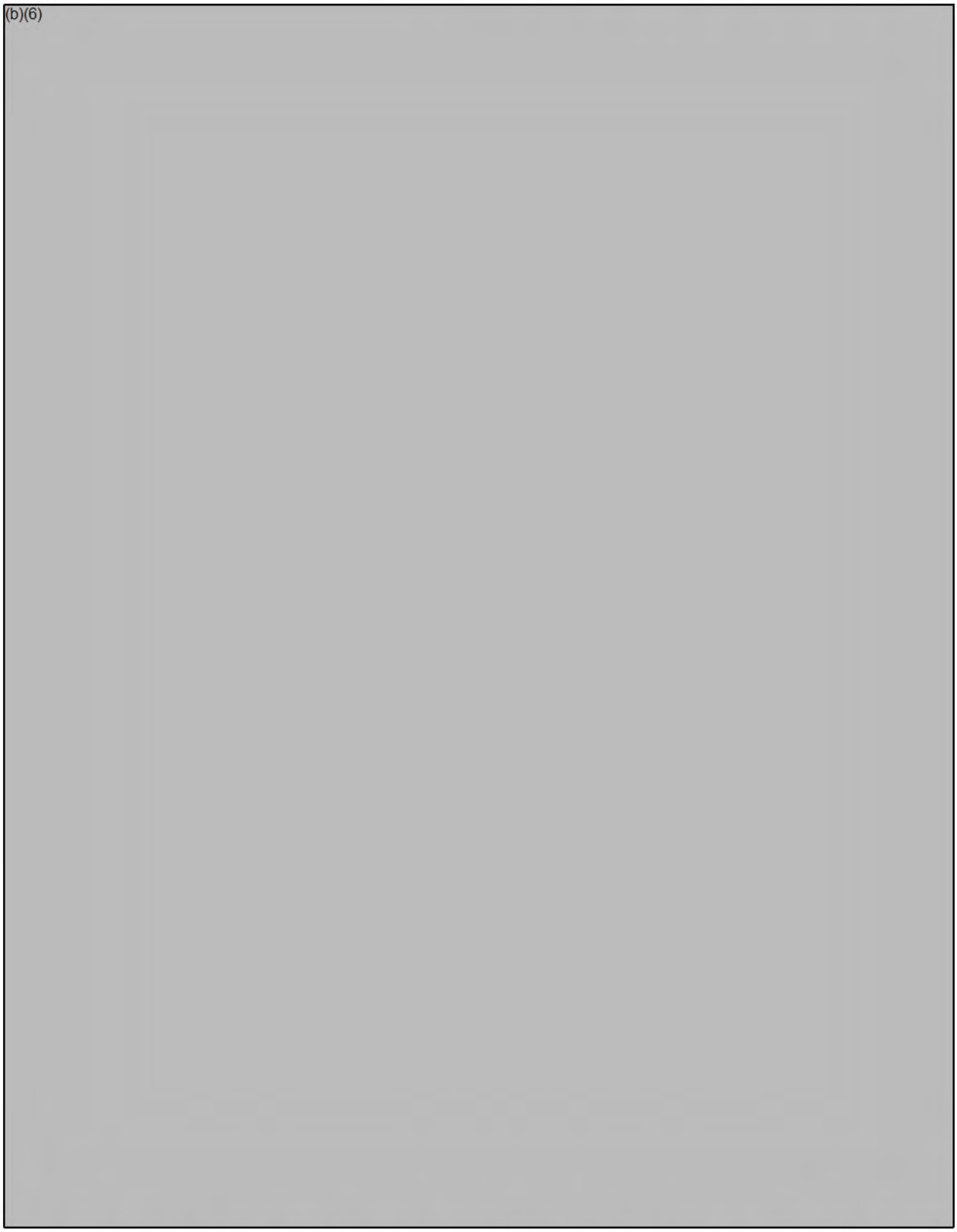

Figure 2. Remnant ground materials and powder from the dental remains of CIL 1995-114-X-05. Scale is in cm.

REFERENCES

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1978 Taphonomic and ecologic information from bone weathering. *Palaeobiology* 4:150-162.

Ubelaker, D. H. and B. J. Adams
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FORENSIC ANTHROPOLOGY REPORT: CIL 1995-114-X-04

JPAC CENTRAL IDENTIFICATION LABORATORY

9 September 2011

RESULTS OF ANALYSIS

The skeletal remains designated CIL 1995-114-X-04 are additional portions segregated from a larger group of osseous remains by mitochondrial DNA (mtDNA) sequencing data. The skeletal inventory present includes fragments of the right scapula, two left and one right rib fragments, two thoracic vertebrae fragments, one probable thoracic vertebra fragment, remnant osseous fragments that were not consumed during DNA analysis, and approximately 1.0 g of bone dust and sand (Figure 1). All elements were sampled for mtDNA analysis.

Due to the paucity and condition of remains present, few biological profile estimations are possible. The remains are human in origin and represent one individual as there is no duplication of skeletal elements, and the elements present have a shared mtDNA sequence. An age estimation of greater than 17 years can be gleaned from the epiphyseal stage of complete fusion present on the right scapula (McKern and Stewart 1957). The other remains are consistent in size with an adult. An assessment of sex based on the maximum length of the glenoid cavity of the scapula (41.5 mm) classifies this individual as male (Bass 2005). An assessment of race and an estimation of stature are not possible.

The remains are in fair to poor condition, and there is visible postmortem damage as evidenced by the differential coloration along post-mortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978).

There is rust color and black staining on the scapula. All elements, except one left rib fragment, exhibit rust color staining. The etiology for these staining patterns is unknown. One left rib and one thoracic vertebra transverse process have green staining consistent with contact with copper (Cronyn 1990, Buikstra and Ubelaker 1994). The centrum of a thoracic vertebra has a possible Schmorl's node present. Additionally, there are very fine sand granules in the trabeculae and medullary cavities of the fragments. No other biological determinations are made regarding CIL 1995-114-X-04.

(b)(6)

Anthropologist

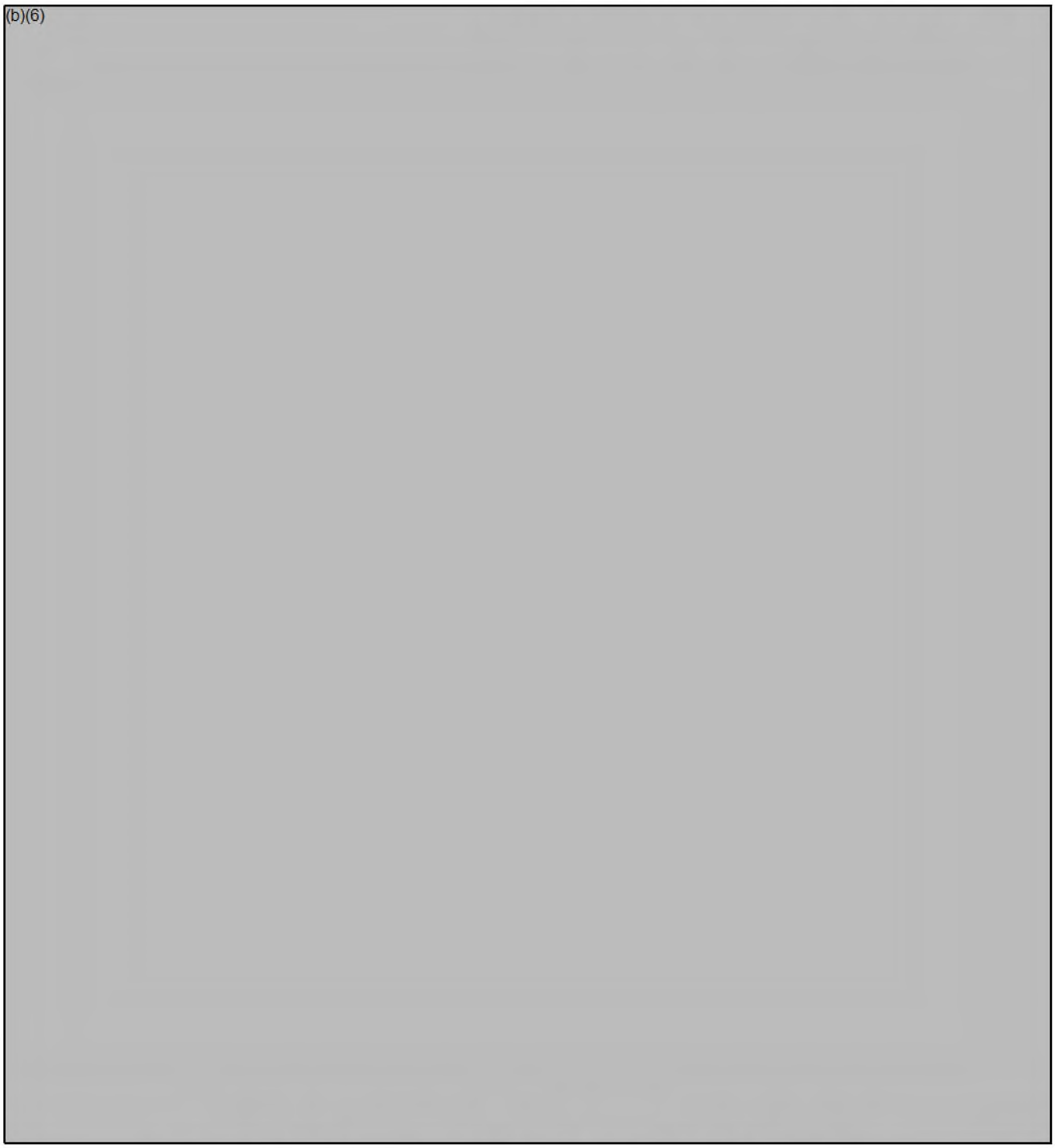

Figure 1. Skeletal remains, CIL 1995-114-X-04. Scale is in dm.

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Bass, W. M.
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FORENSIC ODONTOLOGY REPORT:
CIL 1995-114-X-03

JPAC CENTRAL IDENTIFICATION LABORATORY

4 November 2010

DENTAL REMAINS

The dental remains of CIL 1995-114-X-03 consist of three loose, unrestored teeth, #1, #4, and #16 in good condition. The teeth are bleached white and all three were sampled for mitochondrial DNA (mtDNA) analysis and yielded the same specific sequence. All three teeth were reconstructed with dental wax. Photographs (Figures 1 and 2) and digital radiographs were taken of the dental remains.

Figure 1. CIL 1995-114-X-03 dental remains; facial views of tooth #1 (left), tooth #4 (middle), and tooth #16 (right). The scales are in centimeters.

Figure 2. CIL 1995-114-X-03 dental remains; occlusal views of tooth #1 (left), tooth #4 (middle), and tooth #16 (right). The scale is in centimeters.

ANTEMORTEM DENTAL INFORMATION

This incident is associated with an aircraft loss in Southeast Asia. The available antemortem dental information for the associated casualty, Lance Corporal (LCpl) Andres [NMI] GARCIA, consists of:

1. Standard Form 603 (HEALTH RECORD DENTAL) labeled *GARCIA, ANDRES.* dated *12 JUL1973*, with treatment entries dated *12 JUL 1973* through *6 May 75* which are signed or initialed by the treatment providers.
2. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *GARCIA, ANDRES* dated *30 May 73*, and containing a dental chart. This form is signed by a medical corps officer.
3. Standard Form 513 (CLINICAL RECORD CONSULTATION SHEET) labeled *Garcia, Andres LCpl* and dated *6 May 75* and *30 Apr 75*.

COMPARISON

The dental remains of CIL 1995-114-X-03 compare favorably to the available antemortem dental evidence of LCpl GARCIA with no unexplainable discrepancies (Table 1). A single point of concordance is present in the comparison with unrestored tooth #4.

LCpl GARCIA was previously identified on 8 May 2000 under the designation CILHI 1995-114-I-04. Teeth #1, #4, and #16 were not components of the previous identification.

Table 1. CIL 1995-114-X-03 antemortem and postmortem dental comparison table.		
Tooth #	**LCpl GARCIA**	**CIL 1995-114-X-03**
1	X	V
4	V	V
16	X	V
Key: Green shade = concordance; yellow shade = explainable discrepancy; X = tooth missing antemortem; V = tooth unrestored.		

There is an explainable discrepancy regarding the maxillary third molars (upper wisdom teeth) that warrants mention. Unrestored teeth #1 and #16 are present in the dental remains but are listed as missing in the antemortem dental evidence of LCpl GARCIA. Wisdom teeth are shown to erupt into the oral cavity between 17-21 years of age (Ash and Nelson 2003). LCpl GARCIA would have been 21 years and 5 months of age at the time of this incident; therefore, it is possible that his wisdom teeth were present but simply unerupted or impacted (covered by jawbone or gum tissue). An unerupted or impacted wisdom tooth would not be visible during a routine oral visual exam, and without the aid of dental radiographs, teeth #1 and #16 would likely have been erroneously listed as missing. As dental radiographs are not a component of the available antemortem dental evidence of LCpl GARCIA, this likely explains the current discrepancy regarding these two wisdom teeth.

OPINION

Based upon comparison of the postmortem dental remains of CIL 1995-114-X-03 to the available dental evidence of LCpl GARCIA, a single point of concordance is present with unrestored tooth #4. As there are no unexplainable discrepancies in the comparison, it is my opinion that the dental remains of CIL 1995-114-X-03 are possibly those of:

Lance Corporal Andres [NMN] *GARCIA, 585-72-0306, U.S. Marine Corps.*

(b)(6)

Odontologist

REFERENCE

Ash, M. M. and S. J. Nelson
2003 *Wheeler's Dental Anatomy, Physiology, and Occlusion.* 8th edition. Saunders, St. Louis, MO.

FORENSIC ANTHROPOLOGY REPORT:
CIL 1995-114-X-03

JPAC CENTRAL IDENTIFICATION LABORATORY

1 February 2011

RESULTS OF ANALYSIS

The skeletal remains CIL 1995-114-X-03 are additional portions segregated from a larger group of osseous materials by mitochondrial DNA (mtDNA) sequencing data. The skeletal inventory includes three teeth, with remnant unconsumed powdered material in six tubes (see Forensic Odontology Report: CIL 1995-114-X-03), a right zygomatic, two left metacarpals (MC II and IV), one proximal hand phalanx, a right patella fragment, and a probable tibia shaft fragment (Figure 1). All elements were sampled for mtDNA analysis.

The remains are human in origin and represent one individual as there is no duplication of skeletal elements, and the elements have a shared mtDNA sequence. Due to the paucity and condition of remains present, few biological profile estimations are possible. The remains are consistent in size with an adult. Additionally, the maxillary third molar roots were scored using the methods outlined by Mincer *et al.* (1993) as Stage H (e.g., complete closure of apical ends of roots). According to their study (Mincer *et al.* 1993), maxillary third molars exhibiting a Stage H score are 85.3% likely to come from an individual at least 18 years of age if male. For females with maxillary third molar apical root maturation, there is an 89.6% probability of the individual having attained at least 18 years old. Assessments of sex and race, as well as estimation of stature, are not possible.

The probable tibia diaphyseal fragment exhibits possible perimortem trauma with breakage lines consistent with an oblique fracture pattern (Galloway 1999:53). This assessment of possible perimortem trauma should be taken with caution as taphonomy has affected this element.

The remains are in fair to poor condition. There is visible postmortem damage in all the elements in the assemblage, and this is evidenced by differential coloration along postmortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978). Additionally, there are very fine sand granules in the trabeculae and medullary cavities of the fragments. No other biological determinations are made regarding CIL 1995-114-X-03.

(b)(6)

Anthropologist

REFERENCES

Behrensmeyer, A. K.
1978 Taphonomic and ecologic information from bone weathering. *Palaeobiology* 4:150-162.

Galloway, A.
1999 The biomechanics of fracture production. In: *Broken Bones: Anthropological Analysis of Blunt Force Trauma*, edited by A. Galloway, pp. 35-62. Charles C Thomas, Springfield, IL.

Mincer, H. H., E. F. Harris, and H. E. Berryman
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Ubelaker, D. H. and B. J. Adams
1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-513.

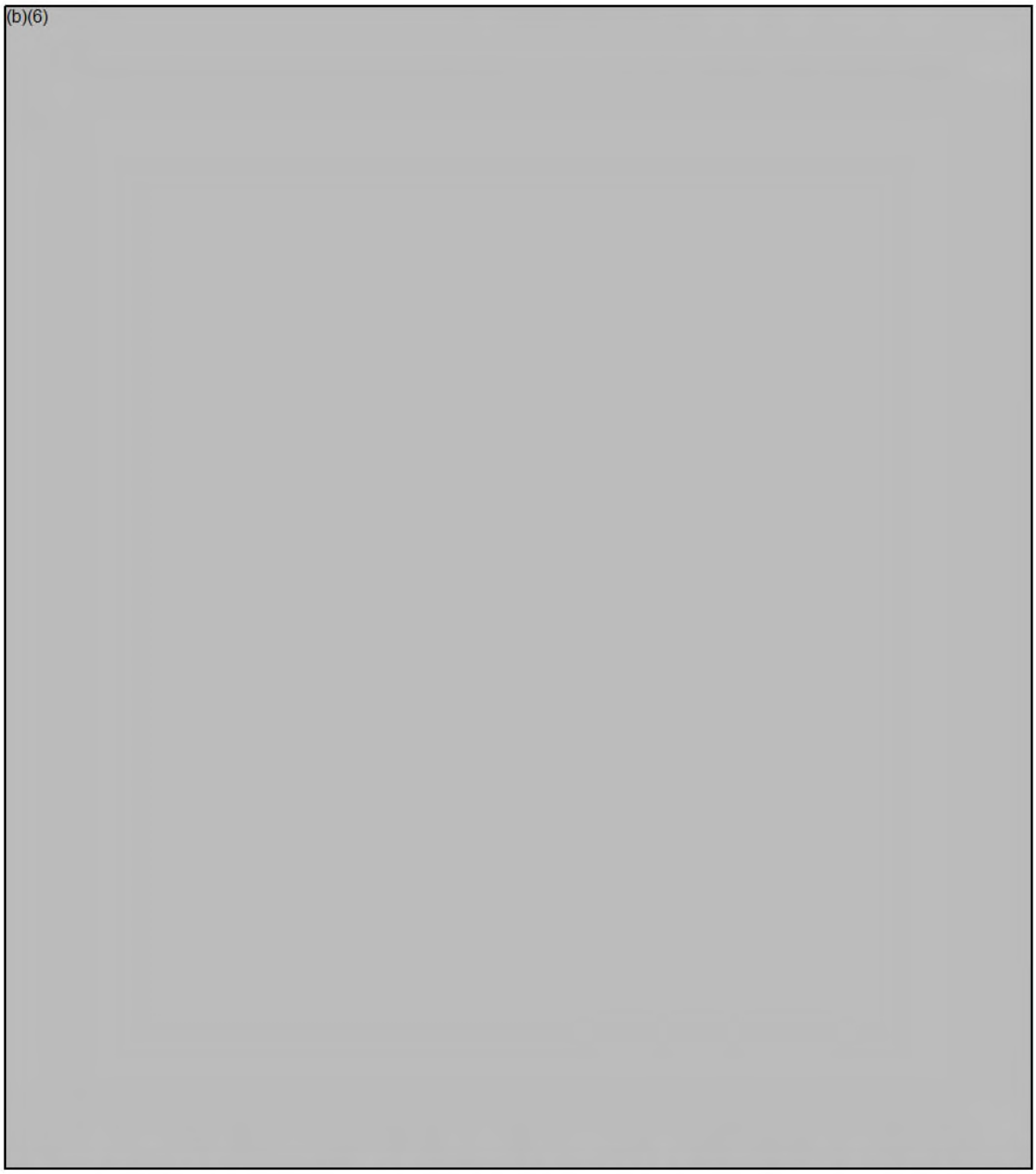

Figure 1. Skeletal remains and six sample tubes, CIL 1995-114-X-03. Scale is in cm.

FORENSIC ANTHROPOLOGY REPORT: CIL 1995-114-X-02

JPAC CENTRAL IDENTIFICATION LABORATORY

9 September 2011

RESULTS OF ANALYSIS

The skeletal remains designated CIL 1995-114-X-02 are additional portions segregated from a larger group of osseous remains by mitochondrial DNA (mtDNA) sequence data. The skeletal inventory present includes fragments of the right femur (proximal half) and fragments of left and right tibiae. Additionally there are small fragments of the three long bones that were not consumed during DNA analysis and 2.3 g of bone dust/sand (Figure 1). All elements were sampled for mtDNA analysis. The minimum number of individuals (MNI) is one. The MNI is based on the shared genetic sequence data and no duplication of elements. Reconstruction of some of the remnant osseous fragments was accomplished using an acetone-soluble adhesive.

Due to the paucity and condition of remains present, few biological profile estimations are possible. The remains are human in origin. The distal epiphysis of the right tibia appears as stage 4 fusion. According to McKern and Stewart (1957) this stage of fusion indicates an age of at least 17 years. A definitive assessment of race is not possible; however, an examination was made utilizing osteometric measurements of the femur and tibia. The subtrochanteric shape of the right femur (Gilbert and Gill 1990; Wescott 2005) yields an anterior-posterior dimension of 28.7 mm and a medial-lateral dimension of 28.8 mm. These measurements classify the femur as eurymeric and place it within the American Blacks and American Whites sample of Gilbert and Gill (1990). A two-group (Black and White Males) discriminant function analysis using five variables of the femur and tibia using *FORDISC 3.0* (Jantz and Ousley 2005) classifies the remains as a White Male. An assessment of sex and an estimation of stature are not possible.

The remains are in fair condition, and there is possible perimortem trauma noted on the right femoral diaphysis that is consistent with a possible spiral fracture (Galloway 1999). Visible postmortem damage is present as evidenced by the differential coloration along postmortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978).

There is polychromate staining on the remains, namely: green staining on the left tibia which is consistent with contact with copper (Cronyn 1990; Buikstra and Ubelaker 1994); rust-colored staining present on the right tibia, of unknown etiology. A paper- or fabric-like material adheres to the right tibia as well. Fine rootlets are attached to the diaphysis of the left tibia. Additionally, there are very fine sand granules in the trabeculae and medullary cavities of all fragments. No other biological determinations are made regarding CIL 1995-114-X-02.

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Anthropologist

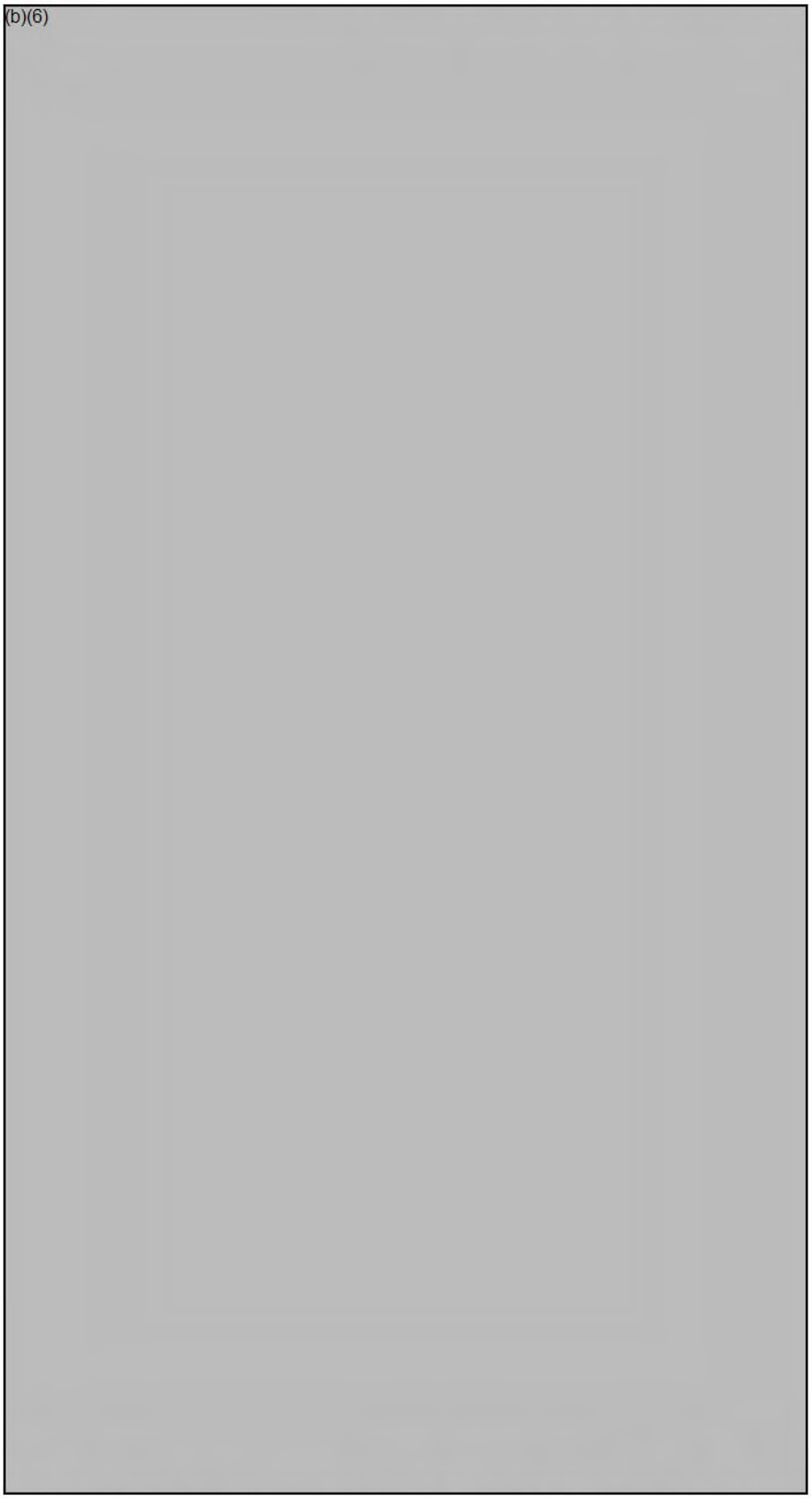

Figure 1. Skeletal remains, CIL 1995-114-X-02. Scale is in dm.

REFERENCES

Behrensmeyer, A. K.
1978 Taphonomic and ecologic information from bone weathering. *Palaeobiology* 4:150-162.

Buikstra, J. E. and D. H. Ubelaker (editors)
1994 *Standards for Data Collection from Human Skeletal Remains*. Arkansas Archeological Survey Research Series No. 44, Fayetteville, AR.

Cronyn, J. M.
1990 *The Elements of Archaeological Conservation*. Routledge, London.

Galloway, A. (editor)
1999 *Broken Bones: Anthropological Analysis of Blunt Force Trauma*. Charles C Thomas, Springfield, IL.

Gilbert, R. and G. W. Gill
1990 A metric technique for identifying American Indian femora. In *Skeletal Attribution of Race: Methods for Forensic Anthropology*, edited by G. W. Gill and S. Rhine, pp. 97-99. Maxwell Museum Anthropological Papers No. 4, University of New Mexico, Albuquerque, NM.

Jantz, R. and S. Ousley
2005 *FORDISC 3.0*. University of Tennessee, Knoxville, TN.

McKern, T. W. and T. D. Stewart
1957 *Skeletal Age Changes in Young American Males*. Quartermaster Research and Development Command Technical Report EP-45, Natick, MA.

Ubelaker, D. H. and B. J. Adams
1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-513.

Wescott, D.J.
2005 Population variation in femur subtrochanteric shape. *Journal of Forensic Sciences* 50:286-293.

FORENSIC ANTHROPOLOGY REPORT:
CIL 1995-114-X-01

JPAC CENTRAL IDENTIFICATION LABORATORY

1 February 2011

RESULTS OF ANALYSIS

The skeletal remains designated CIL 1995-114-X-01 are the additional portions segregated from a larger group of osseous remains by mitochondrial DNA (mtDNA) sequencing data. The skeletal inventory present includes fragments of the left mandibular ascending ramus, the right clavicle, a lumbar vertebra, the right patella, and the distal portion (i.e., articular surface) of an unsided tibia (Figure 1). All elements were sampled for mtDNA analysis.

Due to the paucity and condition of remains present, few biological profile estimations are possible. The remains are human in origin and represent one individual as there is no duplication of skeletal elements, and the elements present have a shared mtDNA sequence. The remains are consistent in size with an adult. Assessments of sex and race, as well as estimation of stature, are not possible.

The remains are in fair to poor condition, and there is visible postmortem damage as evidenced by the differential coloration along postmortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978). Additionally, there are very fine sand granules in the trabeculae and medullary cavities of the fragments. No other biological determinations are made regarding CIL 1995-114-X-01.

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Anthropologist

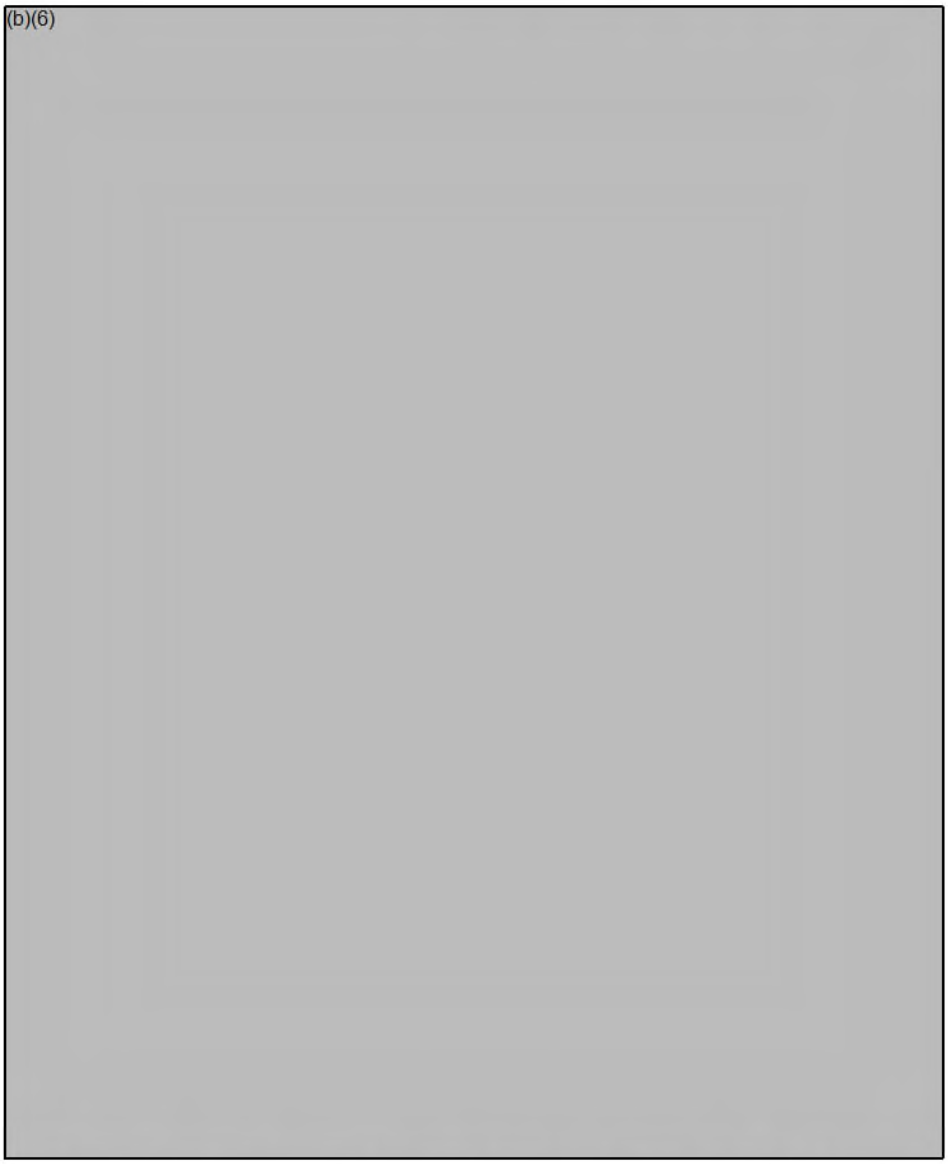

Figure 1. Skeletal remains, CIL 1995-114-X-01. Scale is in cm.

REFERENCES

Behrensmeyer, A. K.
1978 Taphonomic and ecologic information from bone weathering. *Palaeobiology* 4:150-162.

Ubelaker, D. H. and B. J. Adams
1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-513.

FORENSIC ANTHROPOLOGY REPORT:
CIL 1995-114-I-13

JPAC CENTRAL IDENTIFICATION LABORATORY

1 February 2011

RESULTS OF ANALYSIS

The skeletal assemblage designated CIL 1995-114 consists of remains that were consolidated into a single accession. The remains were from numerous accessions of both archaeological recoveries and unilateral turnovers. Segregation of this assemblage occurred utilizing mitochondrial DNA (mtDNA) and anthropological analyses. Based on results of these analyses, osseous elements were segregated into one individual, and these fragments are now designated CIL 1995-114-I-13. The skeletal inventory present includes a cervical vertebra fragment (consistent with a probable C6 or C7 vertebral body), a thoracic vertebra fragment (consistent with the upper thoracic vertebral region), and an unseriated right rib fragment (Figure 1). All elements were sampled for mtDNA analysis.

Due to the paucity and condition of remains present, few biological profile estimations are possible. The remains are human in origin and represent one individual as there is no duplication of skeletal elements and the elements have a shared mtDNA sequence. The remains are consistent in size with an adult. Assessments of race and sex, as well as estimation of stature, are not possible.

The remains are in fair to poor condition, and there is visible postmortem damage as evidenced by the differential coloration along post-mortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978). There are also very fine sand granules in the trabeculae of the fragments. Two discolorations are present on the thoracic vertebra. One is rust-colored and located on the left transverse process, and there is a faint green stain present on the intervertebral area. The etiology of these stains is unknown. No other biological determinations are made regarding CIL 1995-114-I-13.

(b)(6)

Anthropologist

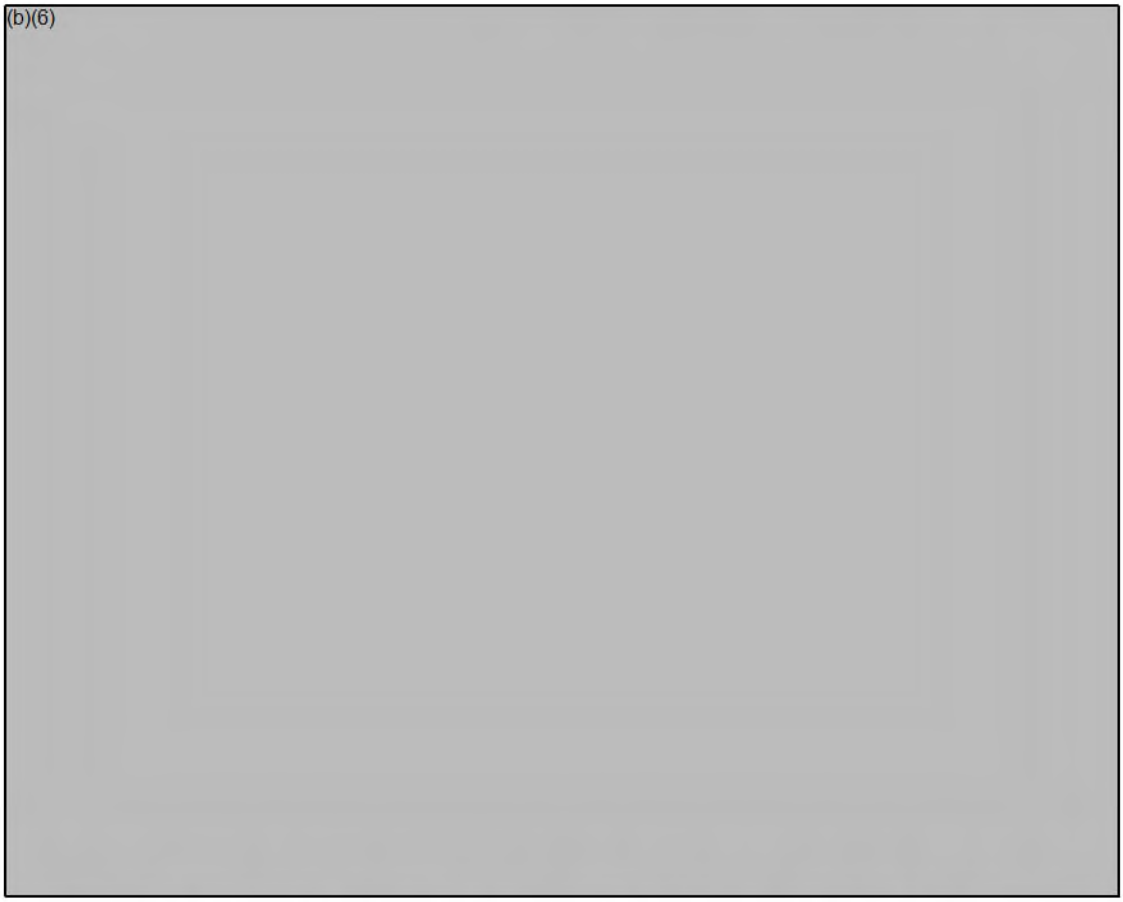

Figure 1. Skeletal remains, CIL 1995-114-I-13. Scale is in cm.

REFERENCES

Behrensmeyer, A. K.
1978 Taphonomic and ecologic information from bone weathering. *Palaeobiology* 4:150-162.

Ubelaker, D. H. and B. J. Adams
1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-513.

FORENSIC ANTHROPOLOGY REPORT:
CIL 1995-114-I-12

JPAC CENTRAL IDENTIFICATION LABORATORY

1 February 2011

RESULTS OF ANALYSIS

The skeletal assemblage designated CIL 1995-114 consists of remains that were consolidated into a single accession. The remains were from numerous accessions of both archaeological recoveries and unilateral turnovers. Segregation of this assemblage occurred utilizing anthropological and mitochondrial DNA (mtDNA) analyses. Based on results of these analyses, osseous elements were further segregated into one individual, and these fragments are now designated CIL 1995-114-I-12. The skeletal inventory present includes a right pubic symphysis fragment, an unsided sciatic notch fragment, and a fragmentary probable left patella (Figure 1). All elements were sampled for mtDNA analysis.

Due to the paucity of remains present, few biological profile estimations are possible. The remains are human in origin and represent one individual as there is no duplication of skeletal elements, and the elements have a shared mtDNA sequence. Sex assessment is based on the right pubic symphysis fragment. While damaged, there are characteristics present that indicate it is from a probable male. Namely, there is a broad medial surface, there is no ventral arc, and there is no subpubic concavity (Buikstra and Ubelaker 1994; Phenice 1969). Furthermore, the remains are consistent in size with an adult. The right pubic symphysis fragment is severely weathered, however remnant symphyseal billowing is observable. This billowing is consistent with a younger individual (Katz and Suchey 1986). Neither an assessment of race nor an estimation of stature is possible.

The remains are in fair to poor condition, and there is visible postmortem damage as evinced by the differential coloration along postmortem breakage lines (Ubelaker and Adams 1995). There is cortical exfoliation, and the remains are friable and fragile. There is evidence of weathering throughout, and their condition is consistent with exposure to the elements (Behrensmeyer 1978). There are also very fine sand granules in the trabeculae of the fragments. No other biological determinations are made regarding CIL 1995-114-I-12.

(b)(6)

Anthropologist

Figure 1. Skeletal remains, CIL 1995-114-I-12. Scale is in cm.

REFERENCES

Behrensmeyer, A. K.
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Katz, D. and J. M. Suchey
1986 Age determination of the male os pubis. *American Journal of Physical Anthropology* 69:427-435.

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1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-512.

FORENSIC ANTHROPOLOGY REPORT:
CIL 1995-114-I-11

JPAC CENTRAL IDENTIFICATION LABORATORY

18 October 2010

RESULTS OF ANALYSIS

The remains designated CIL 1995-114-I-11 consist of a right temporal with an associated small fragment, a basilar fragment of the occipital, a partial first cervical vertebra (C1), the distal half of a right fibula, an unseriated right rib shaft, a partial right calcaneus, and multiple small osseous fragments mixed with sediment (Figures 1 and 2). The skeletal remains overall are in fair condition, with extensive postmortem erosion. Reconstruction of the right fibula was necessary using an acetone-soluble adhesive. These remains represent a minimum of one individual. There is no duplication of elements, and the elements that are present are broadly consistent in terms of size, development, and taphonomic history. These remains were separated from a larger group of heavily commingled remains using mitochondrial DNA (mtDNA) analysis, and each element has been sampled. Multiple elements have bone residue left from the mtDNA analytical process (Figure 2).

The mastoid process of the right temporal scores at least a 3 (Buikstra and Ubelaker 1994) despite postmortem erosion, indicating that these remains represent a probable male (Walker 2008). The distal fibula is fully fused, which indicates a minimum age of 16 years in males (Suchey 2006). The race and stature of these remains are indeterminate due to a lack of distinguishing morphological characteristics and intact surfaces for measurement. No perimortem trauma is visible.

All elements except the right rib are bleached white and have heavily abraded surfaces with randomly oriented striations. Some exposed margins also show rounding, and the elements retain embedded fine sand grains. These taphonomic characteristics are indicative of deposition and tumbling in a marine environment (pers. obs.). The occipital, right rib, right fibula, and right calcaneus also have staining consistent with iron oxide (Cronyn 1990). Some minor flaking, especially on the fibula proximal margin, is postmortem in origin as indicated by bone margins lighter in color than the surrounding unfractured bone (Ubelaker and Adams 1995). The fibula has been labeled with the number "120" by a previous analyst.

(b)(6)

Anthropologist

REFERENCES

Buikstra, J. E. and D. H. Ubelaker (editors)
1994 *Standards for Data Collection from Human Skeletal Remains*. Arkansas Archeological Survey Research Series No. 44, Fayetteville, AR.

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Suchey, J.
2006 Workshop materials for determination of skeletal age, presented at the JPAC-CIL on 18 January 2006.

Ubelaker, D. H. and B. J. Adams
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Walker, P. L.
2008 Sexing skulls using discriminant function analysis of visually assessed traits. *American Journal of Physical Anthropology* 136:39-50.

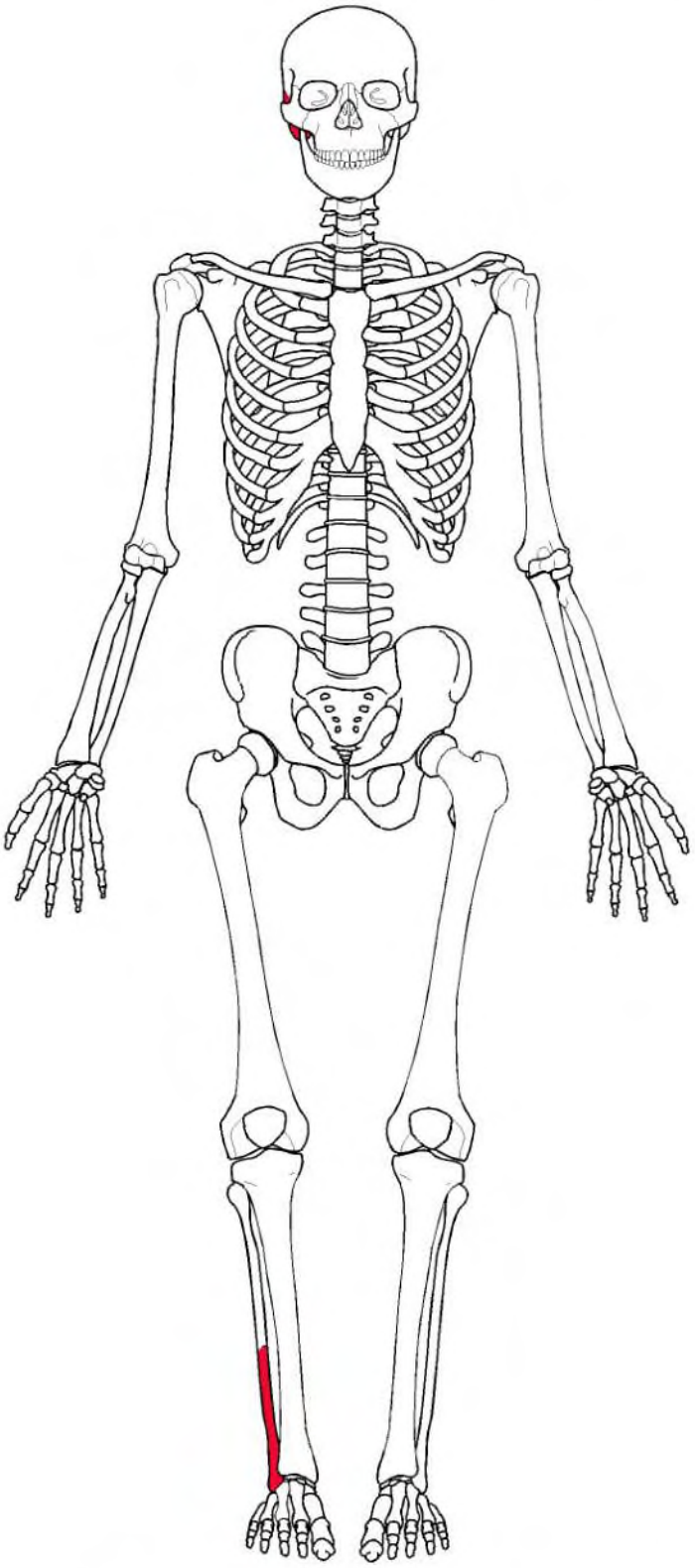

Figure 1. Skeletal representation of CIL 1995-114-I-11. Elements in red are present; C1, occipital fragment, rib, and calcaneus are not depicted.

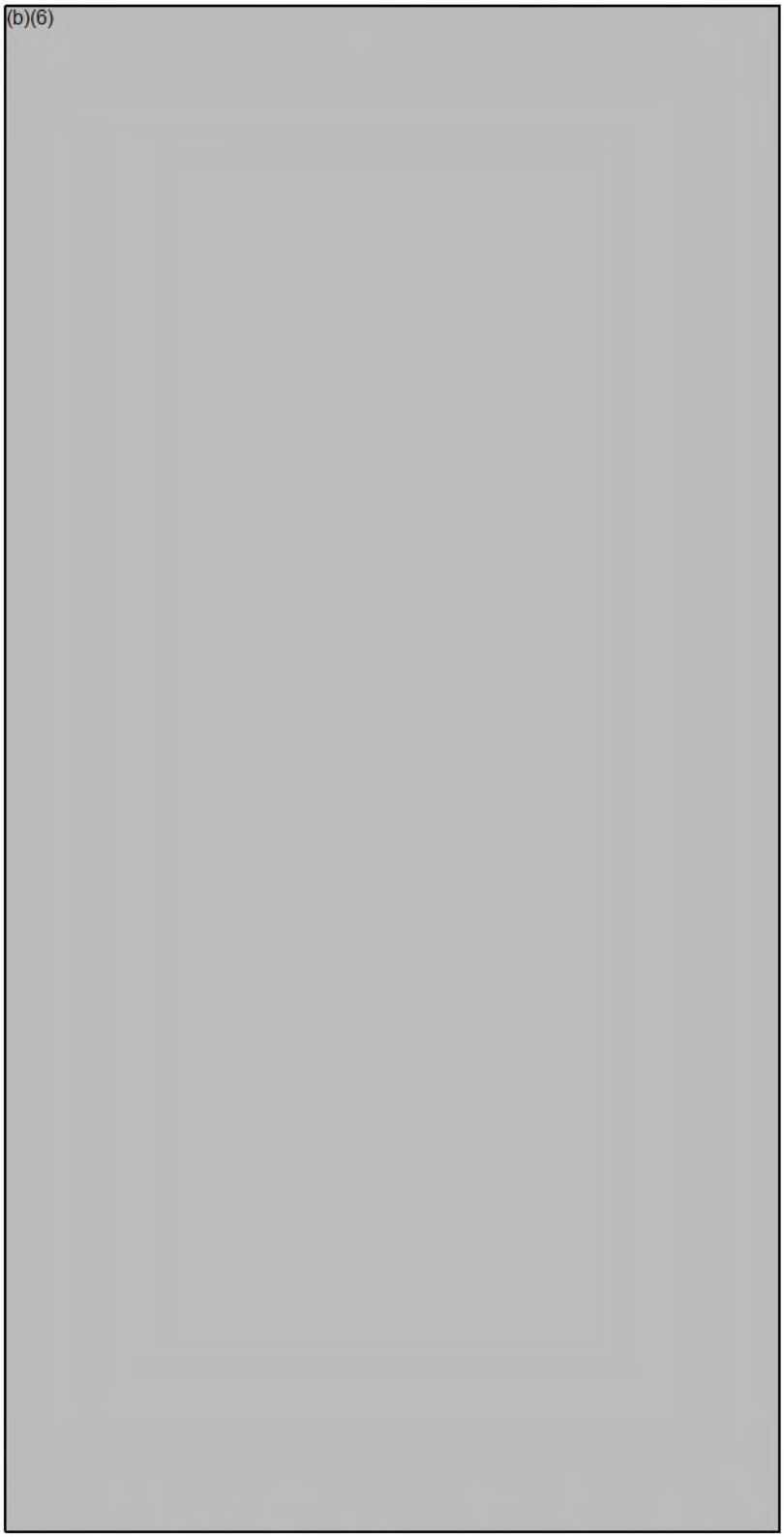

Figure 2. Skeletal photograph of CIL 1995-114-I-11: (a) right temporal, associated small fragment, and mtDNA sampling residue (dish), (b) occipital fragment, (c) C1 and mtDNA sampling residue (dish), (d) right rib, (e) right fibula, (f) calcaneus, and (g) small fragments mixed with sand. All visible cutting is from mtDNA sampling. Scale is in cm.

FORENSIC ANTHROPOLOGY REPORT:
CIL 1995-114-I-10

JPAC CENTRAL IDENTIFICATION LABORATORY

2 June 2010

RESULTS OF ANALYSIS

The remains designated CIL 1995-114-I-10 consist of a right tibia shaft and a right humerus shaft (Figures 1 and 2). The skeletal remains overall are in fair condition, with extensive postmortem erosion. No reconstruction was necessary. These remains represent a minimum of one individual. There is no duplication of elements, and the elements that are present are broadly consistent in terms of size, development, and taphonomic history. These remains were separated from a larger group of heavily commingled remains using mitochondrial DNA (mtDNA) analysis, and both elements were sampled.

The sex, race, and stature of these remains are indeterminate due to a lack of distinguishing morphological characteristics and intact surfaces for measurement. Based upon overall development, their age is consistent with adult or older juvenile. No perimortem trauma is visible.

Both elements are bleached white and have heavily abraded surfaces with randomly oriented striations. Some exposed margins also show rounding, and the tibia shaft retains embedded fine sand grains. These taphonomic characteristics are indicative of deposition and tumbling in a marine environment (pers. obs.). The right humerus shaft displays fine longitudinal cracking, which may have resulted from drying or from pressure applied while being sampled for mtDNA analysis. The right humerus also has minor speckled staining consistent with iron oxide. Some minor flaking is postmortem in origin, as indicated by bone margins lighter in color than the surrounding unfractured bone (Ubelaker and Adams 1995).

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(b)(6)

Anthropologist

REFERENCE

Ubelaker, D. H. and B. J. Adams
1995 Differentiation of perimortem and postmortem trauma using taphonomic indicators. *Journal of Forensic Sciences* 40:509-512.

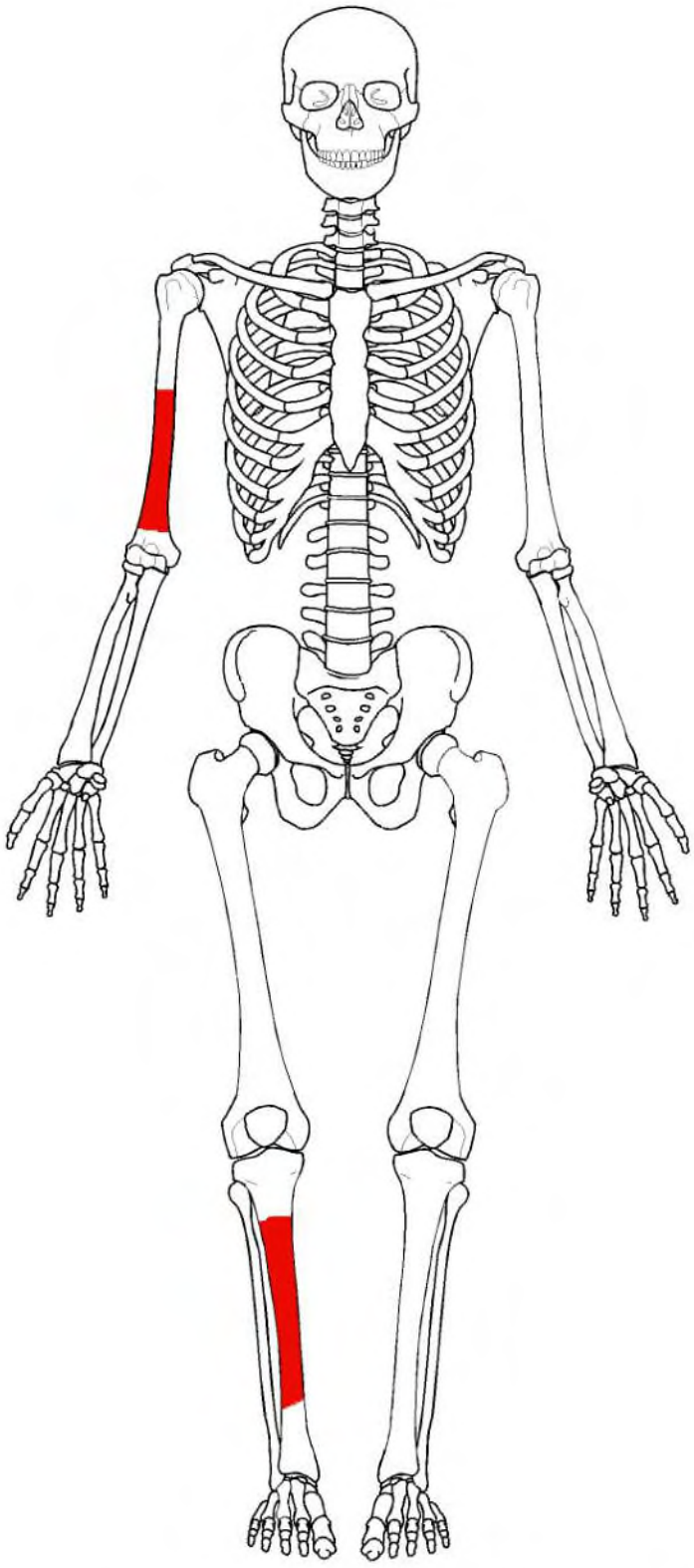

Figure 1. Skeletal representation of CIL 1995-114-I-10. Elements in red are present.

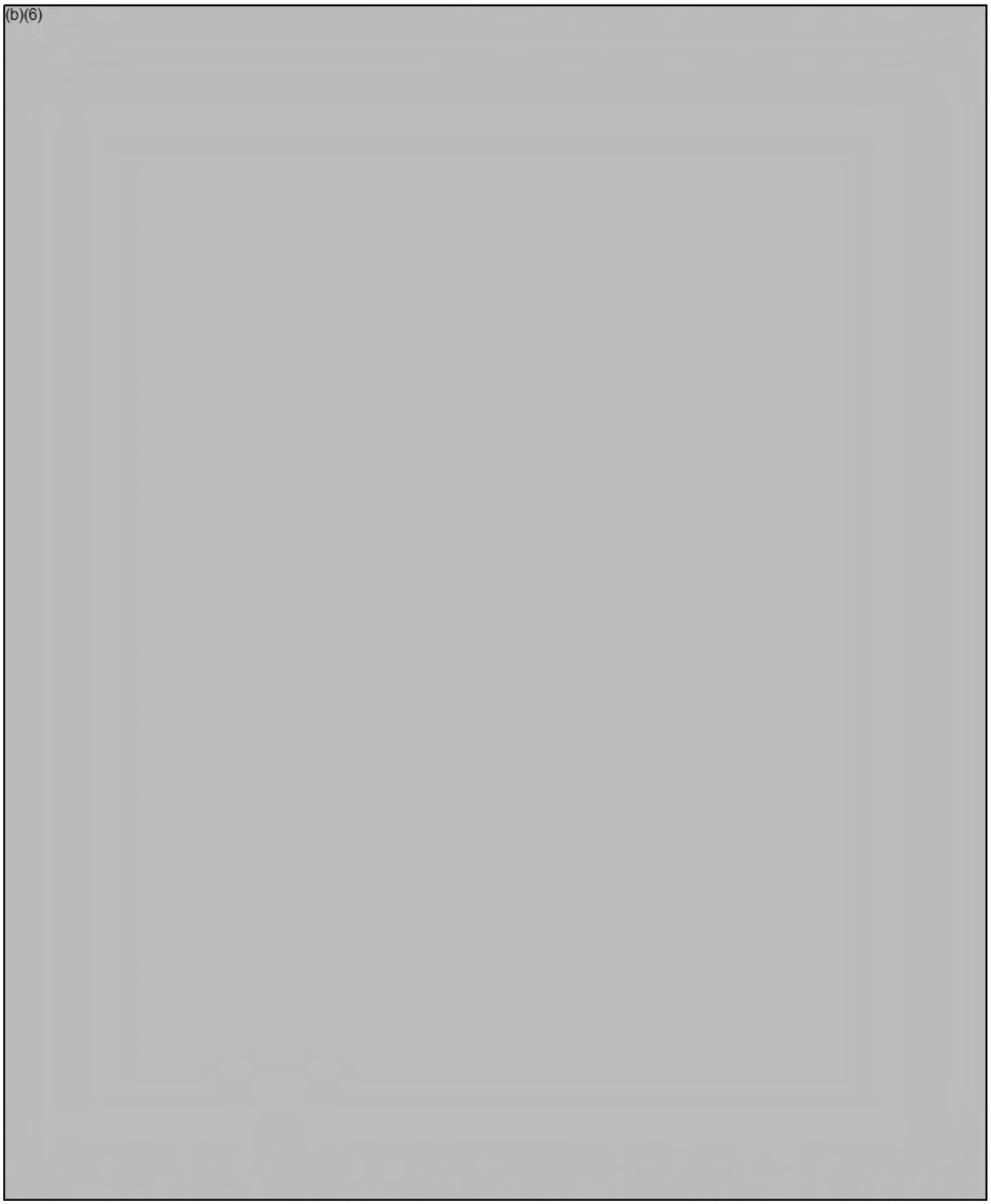

Figure 2. Skeletal photograph of CIL 1995-114-I-10: (a) right humerus and (b) right tibia. The dish to the right of each element contains residue from mtDNA sampling. Scale is in centimeters.

FORENSIC ODONTOLOGY REPORT: CIL 1995-114-G-01

JPAC CENTRAL IDENTIFICATION LABORATORY

1 November 2011

DENTAL REMAINS

The dental remains of CIL 1995-114-G-01 consist of a maxillary fragment and three disarticulated teeth. The specific characteristics are as follows: the maxillary fragment includes articulated teeth #14 and #15 and perimortem/postmortem missing teeth #9-#13 and #16; and disarticulated teeth #1, #23, and a root of an unspecified maxillary anterior tooth. The minimum number of individuals is one, due to the lack of duplicated elements. Teeth #14, #15, and the maxillary fragment were sampled for mitochondrial DNA (mtDNA) analysis, but did not yield a conclusive sequence. Both sampled teeth were reconstructed with dental wax. Digital photographs (Figures 1 through 3) and radiographs were taken of the dental remains.

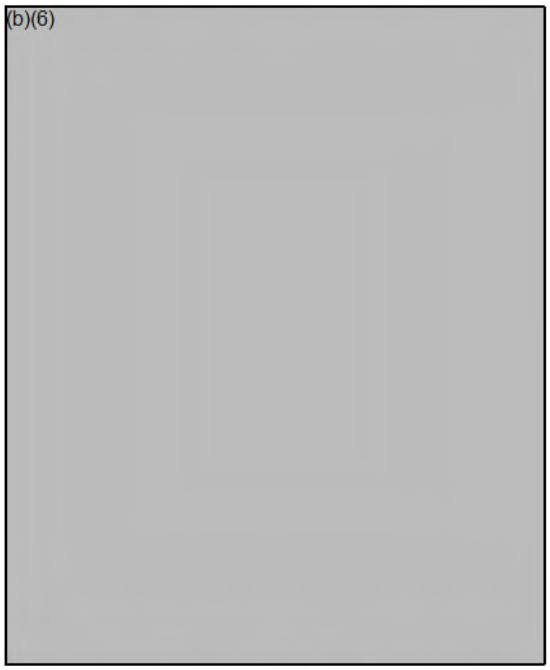

Figure 1. CIL 1995-114-G-01, occlusal view of the maxillary fragment. The scale is in centimeters.

Figure 2. CIL 1995-114-G-01, facial view (left) and lingual view (right) of the maxillary fragment and the posterior teeth. The scales are in centimeters.

Figure 3. CIL 1995-114-G-01, occlusal view of tooth #1 and facial view of the anterior teeth (left) and lingual view of the disarticulated dental remains (right). The scales are in centimeters.

ANTEMORTEM DENTAL INFORMATION

This incident involves a loss of a CH-53 helicopter with the loss of the following 13 servicemembers on board: Second Lieutenant (2nd Lt) Richard [NMN] VANDEGEER, Hospital Corpsman First Class (HM1) Bernard [NMN] GAUSE, Jr., Hospitalman (HN) Ronald J. MANNING, Lance Corporal (LCpl) Gregory Scott COPENHAVER, Lance Corporal (LCpl) Andres [NMN] GARCIA, Private First Class (PFC) Daniel Andrew BENEDETT, PFC Lynn [NMN] BLESSING, PFC Walter [NMN] BOYD, PFC James Joseph JACQUES, PFC James Rickey MAXWELL, PFC Richard William RIVENBURGH, PFC Antonio Ramos SANDOVAL, and PFC Kelton Rena TURNER. The available antemortem dental records for the associated casualties consist of:

1. Scanned bitewing radiographs (2) which are contained in the antemortem dental record of 2nd Lt Richard VANDEGEER which are unlabeled and dated *25 JAN 75.*
2. Scanned full mouth survey (14 periapical and 2 bitewing radiographs) which is unlabeled but contained within an envelope labeled *VANDEGEER, RICHARD* and dated *1 Jun 73.*
3. Standard Form 603 (DENTAL) labeled *VANDEGEER RICHARD* which is dated *1 FEB 74*, signed by a dental officer, and with dental treatment entries dated *FEB 01 1974* through *7 Mar75.*
4. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *VANdERgEER, RichARD (NMN)* which is dated *24 JAN 75*, and signed by a physician.
5. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *VANDEGEER, RICHARD* which is dated *5 Feb 74*, and signed by a physician, a reviewing officer or approving authority, and a dental officer.
6. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *VANDEGEER, RICHARD* which is dated *1June 73,* and signed by two physicians, a reviewing officer or approving authority, and a dental officer.
7. Second copy of Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *VANDEGEER, RICHARD* which is dated *1 June 73*, signed by two physicians, a reviewing officer or approving authority, and a dental officer.
8. Standard Form 603 (DENTAL) labeled *GAUSE, BERNARD (N) jr.,* which is dated *8 NOV 1971,* signed by a dental officer, and with a dental treatment entry dated *10.18.72.*
9. Standard Form 603 (DENTAL) labeled *GAUSE BERNARD JR,* which is dated *APR 18 1966,* signed by a dental officer, and with dental treatment entries dated *PR 15 1965* through *? AUG 1969.*
10. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *GAUSE, BERNARD, JR.,* which is dated *14 Dec 65* and signed by a physician and a reviewing officer or approving authority.
11. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *GAUSE, BERNARD (NMN) JR.* which is dated *12/22/69*, and signed by a physician and a dental officer.
12. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *GAUSE BERNARD JR*, which is dated *14 Dec 71*, and signed by a physician.
13. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *GAUSE, Bernard (NMN) Jr.*, which is dated *13 AUG 1973*, and signed by a physician.
14. Standard Form 603 (DENTAL) labeled *MANNING RONALD JAMES,* which is dated *JAN 5 1973,* signed by a dental officer, and with a dental treatment entry dated *JAN 4 197?.*
15. Form 9ND-NTC-6600/18 (4-71) (DENTAL TREATMENT PLAN) labeled *MANNING, RONALD J*, which is undated and unsigned.
16. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *MAnning, RonAlD JAmes*, which is dated *29 Dec. 72*, and signed by a reviewing officer or approving authority.
17. Scanned panoramic radiograph contained in the antemortem dental record of LCpl Gregory COPENHAVER which is unlabeled and undated.
18. Standard Form 603 (DENTAL) labeled *COPENHAVER GREGORY Scott*, which is dated *20/Aug 74*, and signed by a dental officer.

19. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *COPENHAVER, GREGORY SCOTT,* which is dated *24/MAR/74,* and signed by a reviewing officer or approving authority.
20. Standard Form 603 (DENTAL) labeled *GARCIA, ANDRES.,* which is dated *12 JUL 1973,* signed by a dental officer, and with dental treatment entries dated *12 JUL 1973* through *6 May 75.*
21. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *GARCIA, ANDRES* which is dated *30 May 73*, and signed by a reviewing officer or approving authority.
22. Scanned panoramic radiograph labeled *BENEDETT, DANIEL A*, which is undated.
23. Standard Form 603 (DENTAL) labeled *BENEDETT, DANIEL A.,* which is dated *30 OCT 1974,* signed by a dental officer and with dental treatment entries dated *29 OCT 1974* through *3 FEB 75.*
24. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *BENEDETT, DANIEL ANDREW* which is dated *8May74*, and signed by a physician and a reviewing officer or approving authority.
25. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *BLESSING Lynn* which is dated *07 AUG 1974*, and signed by a reviewing officer or approving authority.
26. Scanned panoramic radiograph in the antemortem dental record of PFC Walter BOYD which is unlabeled and undated.
27. Standard Form 603 (DENTAL) labeled *BOYD, WALTER.*, which is dated *OCT 22 1974,* signed by a dental officer and with a dental treatment entry dated *OCT 22 1974.*
28. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *BOYD ???,* which is dated *12 Sept. 74*, and signed by a reviewing officer or approving authority.
29. Scanned panoramic radiograph labeled *JACQUES, James J,* which is dated *11-74.*
30. Standard Form 603 (DENTAL) labeled *?UES, JAMES J.,* which is dated *5 NOV 1974*, signed by a dental officer and with dental treatment entries dated *5 NOV1974* through *12 NOV 74.*
31. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *JA?QU?S JAMES Joseph* which is dated *26/oct/ 74*, and signed by a reviewing officer or approving authority.
32. Scanned panoramic radiograph labeled *MAXWELL, James R*, which is undated.
33. Standard Form 603 (DENTAL) labeled *MAXWELL, JAMES R.,* which is dated *7 OCT 1974,* signed by a dental officer and with dental treatment entries dated *21 OCT 1974* through *2 Dec 74.*
34. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *MAXWELL, JAMES RICKEY* which is dated *27 JUN 74*, and signed by a reviewing officer or approving authority.
35. Scanned panoramic radiograph labeled *RIVENBURGH, RICHARD W*, dated *10/74.*
36. Standard Form 603 (DENTAL) labeled *RIVENBURGH, RICHARD.,* which is dated *17 OCT 1974*, signed by a dental officer and with dental treatment entries dated *17 OCT 1974* through *19 Feb 75.*
37. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *RIVENBURGH RICHARD WILLIAM* which is dated *28-JUL-74*, and signed by a physician and a reviewing officer or approving authority.
38. Scanned panoramic radiograph labeled *SANDOVAL, A* which is undated.

39. Standard Form 603 (DENTAL) labeled *SANDOVAL, ANTONIO Ramos.*, which is dated *25 SEP 1974*, signed by a dental officer and with dental treatment entries dated *25 SEP 1974* through *? DEC 74.*
40. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *SANDOVAL ANTONIO RAMOS* which is dated *12 Aug. 74*, and signed by a reviewing officer or approving authority.
41. Scanned panoramic radiograph labeled *TURNER, KELTON R* which is dated *8/74.*
42. Standard Form 603 (DENTAL) labeled *TURNER, Kelton Rena,* which is dated *19 AUG 1974*, signed by a dental officer and with dental treatment entries dated *19 AUG 1974* through *16 Feb 75.*
43. Standard Form 88 (REPORT OF MEDICAL EXAMINATION) labeled *TURNER KELTON RENA* which is dated *15 Aug 74*, and signed by a physician and a reviewing officer or approving authority.

COMPARISON

The dental remains of CIL 1995-114-G-01 consist of a maxillary fragment with two articulated teeth and three disarticulated teeth. The radiographs of the dental remains were compared to the available antemortem radiographs of the individuals involved in this incident. The radiographic comparison did not result in a positive association between the dental remains and a single individual.

In addition, the dental characteristics from the remains were compared to the antemortem dental records for all individuals involved in this incident and did not result in a definitive association between the antemortem dental records and dental remains.

OPINION

Due to the inability to positively associate these remains through a comparison of antemortem and postmortem radiographs and the inability to individually segregate them through a comparison with the antemortem dental records of the servicemembers involved in this incident, it is recommended that they be designated CIL 1995-114-G-01, the group remains of the incident involving:

*Second Lieutenant Richard [*NMN*] VANDEGEER, 278-44-8037, U.S. Air Force Reserves;*
*Hospital Corpsman First Class Bernard [*NMN*] GAUSE, Jr., 416-58-0883, U.S. Navy;*
Hospitalman Ronald J. MANNING, 273-56-4886, U.S. Navy;
Lance Corporal Gregory S. COPENHAVER, 215-56-4939, U.S. Marine Corps;
*Lance Corporal Andres [*NMN*] GARCIA, 585-72-0306, U.S. Marine Corps;*
Private First Class Daniel A. BENEDETT, 535-66-2236, U.S. Marine Corps;
*Private First Class Lynn [*NMN*] BLESSING, 179-48-6564, U.S. Marine Corps;*
*Private First Class Walter [*NMN*] BOYD, 229-76-1771, U.S. Marine Corps;*
Private First Class James J. JACQUES, 524-84-7925, U.S. Marine Corps;
Private First Class James R. MAXWELL, 432-19-3985, U.S. Marine Corps;
Private First Class Richard W. RIVENBURGH, 547-98-2864, U.S. Marine Corps;
Private First Class Antonio R. SANDOVAL, 458-96-4809, U.S. Marine Corps;
Private First Class Kelton R. TURNER, 496-60-3371, U.S. Marine Corps.

(b)(6)

Odontologist

FORENSIC ANTHROPOLOGY REPORT: CIL 1995-114-G-01

JPAC CENTRAL IDENTIFICATION LABORATORY

1 November 2011

RESULTS OF ANALYSIS

The osseous remains designated CIL 1995-114-G-01 consist of numerous human bone fragments. Identifiable fragments include cranial portions; a left mandibular condyle; a right maxilla portion with articulating teeth #14 and #15, loose teeth #1 and #23, and one tooth root (see Forensic Odontology Report: CIL 1995-114-G-01); an unsided scapula fragment; three vertebral portions; two right rib, five left rib, and six unsided rib fragments; a right distal humerus and two other unsided distal humeral fragments; a right capitate and trapezium, two first row, two second row, and four third row hand phalanges; a probable left proximal tibia portion; a right talus; one unsided and unnumbered metatarsal, and two second row foot phalanges; multiple undifferentiated long bone fragments and a two small Petri dishes of bone dust and sand (Figure 1). The maxilla and teeth #14 and #15 were sampled for mitochondrial DNA analysis, but they did not yield viable sequence data. Dental wax was used by a previous analyst to reconstruct teeth #14 and #15.

Due to the paucity of remains, biological determinations are very limited. Where possible to determine, the remains are consistent with human exemplars. There is no apparent duplication of elements, indicating a minimum of one individual. The fragments exhibit adult cortical thickness and morphology. Tooth #1 has slightly open root apices upon gross examination [Stage G according to Mincer *et al.* (1993)]. This correlates to an age of approximately 18 years, with a standard deviation of 1.9 years (for both males and females). Several long bone fragments have perimortem fractures. Typically, the fracture margins are sharp and consistent in coloration with the adjacent bone, indicating that the trauma occurred while the bone was still in a fresh state (Galloway 1999). Burning is present on multiple fragments. The burning, in some instances, occurred after the fracturing of the remains, as the fracture surfaces are also burned. The fragments range in color from dark grey to white (calcined), which correlates to Stages II to V from Shipman *et al.* (1984) (depending on fragment, temperatures range from approximately 285° to 940° C). Many calcined fragments have a black interior, showing that the organic component has not been removed completely from the bone portions.

The remains are in fair to good condition and have light colored sand in their porous spaces and medullary cavities. Bleaching is apparent on most of the remains. Several fragments exhibit rounding of their margins, a finding consistent with exposure to an aqueous environment. At least one rib fragment exhibits green staining, likely due to contact with copper-bearing items (Cronyn 1990) while many others have rust-colored staining, indicating contact with a ferrous-

bearing material. No additional biological determinations are made regarding CIL 1995-114-G-01.

(b)(6)

Anthropologist

REFERENCES

Cronyn, J. M.
1990 *The Elements of Archaeological Conservation.* Routledge, London.

Galloway, A. (editor)
1999 *Broken Bones: Anthropological Analysis of Blunt Force Trauma.* Charles C Thomas, Springfield, IL.

Mincer, H. H., E. F. Harris, and H. E. Berryman
1993 A.B.F.O. study of third molar development and its use as an estimator of chronological age. *Journal of Forensic Sciences* 38:379-390.

Shipman, P., G. Foster, and M. J. Schoeninger
1984 Burnt bone and teeth: An experimental study of color morphology, crystal structure and shrinkage. *Journal of Archaeological Science* 11:307-325.

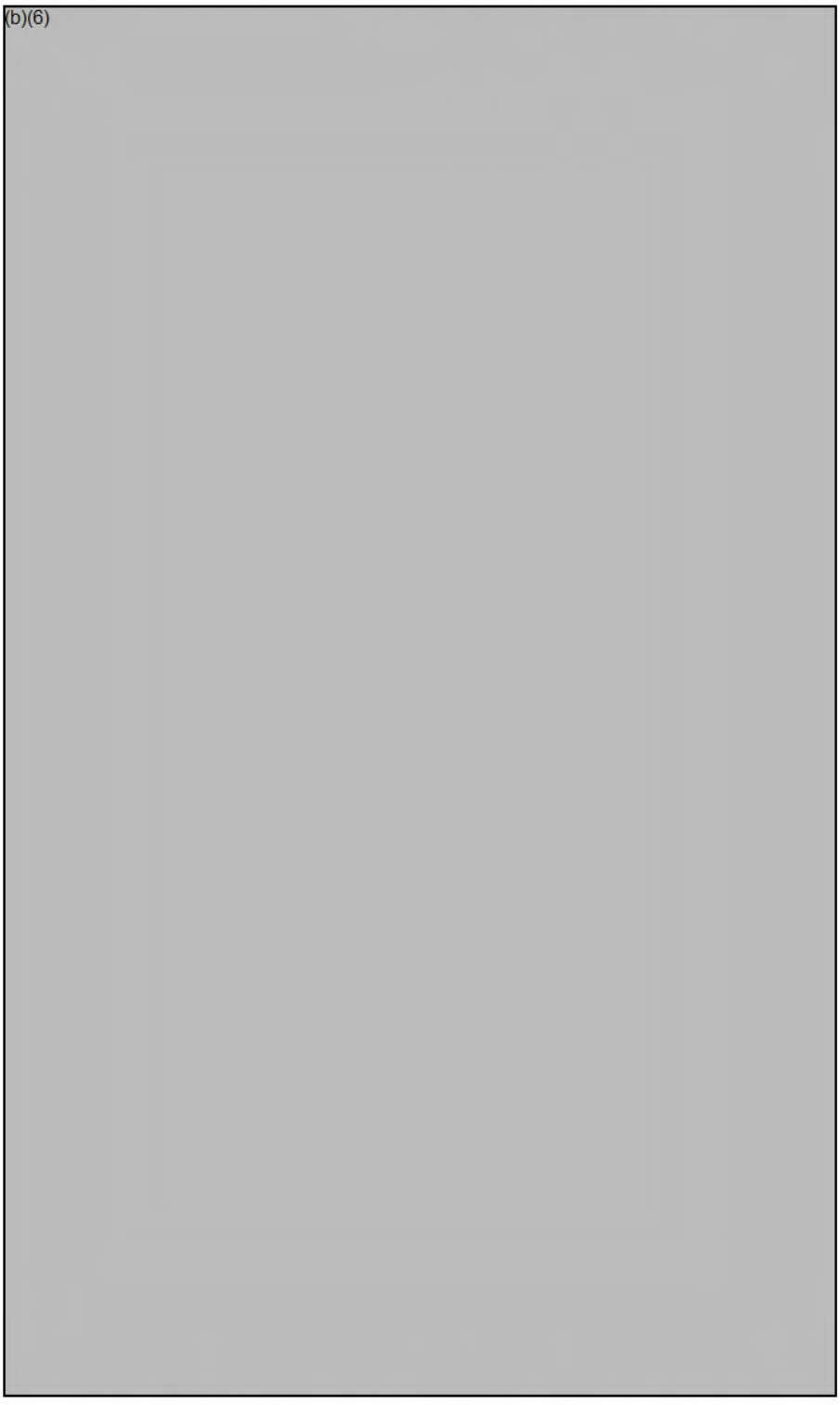

Figure 1. The skeletal remains designated CIL 1995-114-G-01. Note the range of color variation (burning and metallic staining) of the remains, primarily in the bottom two rows. Scale is in decimeters.