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Investigating a child sacrifice event from the Inca heartland

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ABSTRACT

Human sacrifice in the Inca Empire at times took the form of the *capacocha*, a sacrificial rite involving the most beautiful children in the empire. In this study, we investigate a possible *capacocha* at the pre-Columbian site of Choquepukio in the Cuzco Valley of Peru. During excavations at Choquepukio in 2004, seven children (aged 3–12 years) were discovered buried together; accompanying them was an elaborate assemblage of high status artifacts similar to those from other recent archaeological finds that are believed to be *capacocha* sacrifices. Since colonial documents indicate that *capacocha* children were selected from diverse regions of the empire, we initiated a radiogenic strontium isotope analysis to determine the origins of the children found at Choquepukio. Our analysis showed that, indeed, two children in the assemblage had non-local origins. When considered together, the osteological, archaeological, and isotopic evidence suggest that a *capacocha* event occurred at Choquepukio, representing the only lower-elevation *capacocha* to have been found in the Cuzco region.

1. Introduction

Human sacrificial practices of the Inca Empire (AD 1400–1532) have received attention in recent years due to the discovery of well-preserved child mummies on a number of Andean peaks (Reinhard, 1996, 1997, 1999, 2005). These mummies appear to represent the Inca *capacocha*, a sacrificial rite involving children in honor of the Sun and other deities (Benson, 2001; Duviols, 1976; Salomon, 1995:332; Verano, 2008). The term *capacocha* has been translated alternatively as "solemn sacrifice" (Betanzos, 1996[1557]:132) or "royal obligation" (McEwan and van de Gutche, 1992:359).

For this ritual, children of great physical beauty were chosen from locations throughout the empire and brought to the capital city of Cuzco, where they were dressed and adorned, treated to ceremonial rites and feasts, and then redistributed throughout the Inca realm for sacrifice at major shrines (Molina, 1943[1575]). Miniature objects buried with the children, as symbolic gifts from the Inca ruler, established a connection between the community supplying the sacrifice and the divine monarchy of the Inca (McEwan and van de Gutche, 1992:364). *Capacocha* rituals were performed in response to catastrophes such as earthquakes, droughts, and volcanic eruptions, as well as to mark historic events in the life of the emperor, such as succession to the throne (Cobo, 1979[1653]:237, 1990[1653]:112).

The selection of girls and boys from the far reaches of the Inca domain was essential, a stipulation imposed by the Inca to ideologically unify the empire (Rowe, 1982). The names of the sacrificed children were remembered by their local *ayllus* (kin-based corporate groups) and their tombs revered, a system that provided a "network holding the great Inca realm together" (Rowe, 1982:110).

Such characteristics of the *capacocha* allow us to set up a framework for investigating a possible *capacocha* discovery. A ritual of this nature should result in: (1) an archaeological assemblage of child burials, (2) varied geographic origins of the sacrificed children, and (3) elaborate Inca artifacts accompanying the burials. Though the geographical origins may be impossible to determine using material culture alone, chemical analysis of radiogenic strontium isotopes in human skeletal material can be used instead (Price et al., 2007). Local individuals may be distinguished from foreigners by analyzing the strontium isotope ratio ($^{87}Sr/^{86}Sr$) present in an individual's dental enamel—a marker of early-childhood locale—and comparing it to ratios from the local environment.

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In this paper, we investigate a possible *capacocha* at the site of Choquepukio, in the Inca heartland of the Cuzco Valley, Peru. We first describe the *capacocha* ritual based on Spanish colonial documents and archaeological discoveries. Next, we describe seven children found buried together at Choquepukio, using the archaeological and osteological findings. Following these descriptions, we present strontium isotope data to ascertain whether these children were local residents of the Cuzco Valley region or foreigners. Finally, we synthesize and interpret the data in light of Inca religious practices to better understand the role of child sacrifice in the Inca Empire.

2. Ethnohistoric and archaeological evidence of the Inca *capacocha*

2.1. Colonial documents

Information on the Inca *capacocha* can be found in several Spanish colonial documents. One of these, Bernabe Cobo's *Historia del Nuevo Mundo* (Cobo, 1979[1653], 1990[1653]), is considered amongst the most reliable of the Spanish chronicles and presents a comprehensive description of Inca myths, religious beliefs, and ceremonies (Urton, 1990:31). According to Cobo (1990 [1653]:111–114, 156), children ranging from infants to 16-year-olds were selected for sacrifice throughout the Inca realm based on their physical perfection. Parents could also volunteer their children as part of the annual tribute under the Inca system of taxation, an offering that was met with great rewards and social prestige. While both sexes were chosen for the ritual, it appears that females were sacrificed more often than males.

Those children selected for the *capacocha* were brought to Cuzco, lavished with feasts and ceremonies, and then taken to the place of sacrifice, sometimes thousands of kilometers from the capital city (Cobo, 1990[1653]). Upon arrival at their final destination, additional feasts and rituals were held before the children were sacrificed, usually through strangulation, exsanguination, or interment while alive (though probably drugged with alcohol). The bodies of the children were then buried together with elaborate objects of gold, silver, *Spondylus* shell, wood, bone, textile and ceramic (Cobo, 1990[1653]).

The Spanish chronicler Juan de Betanzos (1996[1557]:132) described a *capacocha* event performed at the request of the Emperor Pachacuti as part of his planned funerary rites. Pachacuti ordered that exactly one thousand children be chosen from across the empire and brought to Cuzco, paired ritually as married couples, and buried with the traditional gold and silver "table service" of a wedded couple. Betanzos noted that the sacrificed children were to serve the emperor in his afterlife.

Several chroniclers mentioned *capacocha* rituals that occurred in and around the imperial capital of Cuzco (Betanzos, 1996[1557]; Cobo, 1990[1653]; Molina, 1943[1575]; Sarmiento de Gamboa, 2007 [1572]:119, 140). Betanzos (1996[1557]:46) described a *capacocha* at the Temple of the Sun in the heart of Cuzco, where "well dressed and adorned" children were buried alive to consecrate the new temple. Also, Cobo (1990[1653]:156) wrote of a *capacocha* in which "the children were strangled and buried with gold and silver on the hill of Chuquichanca, which is a half league from [Cuzco] city above San Sebastian" and other rituals performed near the Angostura, southeast of Cuzco city, in which "a greater quantity of children were sacrificed here than anywhere else" (Cobo, 1990[1653]:72).

2.2. Archaeological discoveries

A remarkable *capacocha* discovery was made in 1995 when Johan Reinhard and colleagues found "Juanita," a frozen Inca child mummy, on the summit of Cerro Ampato in the Colca Canyon region of southern Peru (Reinhard, 1996, 2005). The child was wrapped in a belted dress, shawl, and *tupu* (shawl) pin, with leather slippers on her feet; around her lay artifacts including a *Spondylus* female figurine, classic Inca-style ceramics, and a coca bundle. Laboratory analysis revealed that the 13- to 15-year-old Juanita died from a blow to the head, as evidenced by a skull fracture on the right temple (Reinhard, 1997). Three other children were found on Cerro Ampato, including a 9- to 10-year-old boy (though badly charred by lightening) and a 12- to 14-year-old girl with a headdress of macaw feathers and tiny sandals (Bray et al., 2005; Reinhard, 1996). Many of the associated artifacts, such as twin wooden cups and two bird-headed plates, were found in pairs (Reinhard, 1996:76), with the fine Inca ceramics originating from the imperial centers of Cuzco and Tiwanaku (Bray et al., 2005:96).

In 1999, three child mummies were found on Cerro Llullaillaco in northwestern Argentina (Reinhard, 1999, 2005). With them was a diverse assemblage of artifacts, including more than 20 clothed statues that mimicked the apparel of the sacrificed children (Reinhard, 2005:309). While the exact cause of death could not be determined, radiographs of the teeth and long bones provided the ages-at-death for the three individuals: a 6-year-old girl, a 7-year-old boy, and a 15-year-old female (Previgliano et al., 2003:1474).

While these two *capacocha* discoveries—and additional ones found on Cerro Chañi, Cerro Quechuar, and other peaks in the Andean range—were in high-altitude contexts, the ritual was not limited to the Andean peaks. *Capacochas* have also been discovered at lower altitudes, including at Tiwanaku along the Bolivian shore of Lake Titicaca, Túcume on the Peruvian north coast, and on La Plata Island off the coast of Ecuador (Bray et al., 2005:87; Knudson et al., 2006; McEwan and Silva, 1989; McEwan and van de Gutche, 1992:362). Given these archaeological discoveries, along with the ethnohistoric descriptions of *capacochas* performed in and around Cuzco, high-altitude should not be a defining criterion for the identification of a *capacocha* context, as this would limit our understanding of the ritual and its significance within the Inca Empire.

3. Child sacrifice at Choquepukio, Cuzco Valley, Peru

3.1. Archaeological evidence

The assemblage of seven child burials was discovered in 2004 at Choquepukio, a stratified site in the Cuzco Valley occupied continuously from the Early Intermediate Period (~400 BC–AD 540) through the Late Horizon (AD 1476–1532) (McEwan, 2006; McEwan et al., 2002, 1995) (Fig. 1). During excavations of this site, Choquepukio field directors Gordon McEwan and Arminda Gibaja uncovered an imperial Inca building with an intact floor, dated to AD 1410–1520 using radiocarbon samples of burned roofing material and wooden columns (Gibaja et al., 2005). Inlaid in the floor were several stone slabs, below which were two large ceramic jars holding the remains of six adult skeletons in a secondary burial context.

Adjacent to the ceramic jars, six additional individuals—all juveniles—were found near a bedrock outcrop that protruded through the floor and back wall of the building (Fig. 2). As opposed to the secondary interment of the adult skeletons, the child burials were undisturbed primary interments representing a single burial event. The children were buried with an elaborate assemblage of luxury artifacts, including gold and silver miniature female figurines, red *Spondylus* shell figurines of females and llamas, several sets of fine ceramics, gold, silver, and bronze *tupu* pins, a garment covered with gilded metal disks, and large amounts of cloth (Gibaja et al., 2005) (Figs. 3 and 4).

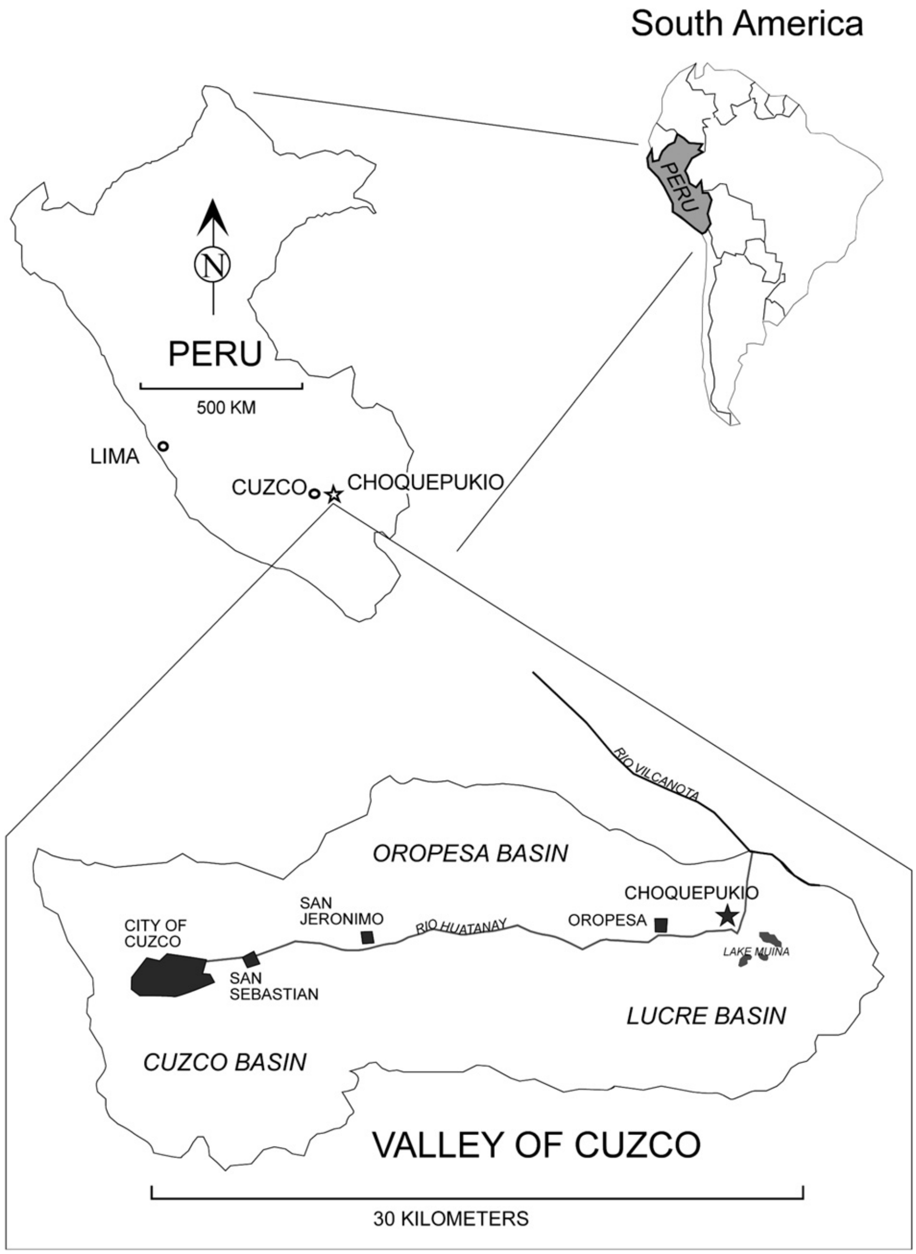

Fig. 1. Map of Choquepukio site location and region.

Approximately 3 m from the group burial, an additional child was uncovered with the most elaborate artifact of all—a silver figurine approximately 25 cm in height with a *Spondylus* shell headdress and fragments of cloth (Gibaja et al., 2005) (Fig. 5). The figurine was modeled with male anatomy and its hands positioned across its chest. Around this artifact were miniature gold, silver, and *Spondylus* figurines of human males and llamas (Fig. 6), with even more rich offerings found nearby, including miniature silver and gold headdress ornaments, gold and silver llama figurines, *Spondylus* shell male human figures, a miniature bracelet, and pieces of gold foil (Fig. 7).

3.2. Osteological evidence

The osteological analysis provided chronological ages-at-death of the children, based on dental development and eruption rates (Moorrees et al., 1963; Ubelaker, 1999). The ages were as follows: one individual of 3–4 years, one of 4–5 years, two of 5–6 years, one of 6–7 years, one of 8–9 years, and one of 11–12 years. The sex of the individuals could not be determined because of their juvenile status. While some methods have been proposed for determining the sex of pre-pubescent skeletal remains (e.g., Cardoso, 2008; Schutkowski, 1993; Weaver, 1980), there is no consensus regarding the reliability of these methods.

The skeletal analysis of these seven individuals did not reveal evidence of physical trauma that would indicate a violent death. However, the bones were found in a poor state of preservation exhibiting cortical damage, exfoliation, and flaking which could have obscured indications of trauma. Along with an absence of trauma, no pathological conditions were found aside from slight dental wear on the deciduous teeth of five children, a condition also observed in two sacrificed children from Cerro Llullaillaco (Previgliano et al., 2003:1476).

Fig. 2. Topographic map of Choquepukio showing location of child burials.

Fig. 3. Paired Inca plates from child burial assemblage.

Fig. 4. Miniature female figurine from child burial assemblage.

4. Strontium isotope evidence from child burials

4.1. Principles of strontium isotope analysis

Strontium isotope analysis has emerged as an important tool for investigating residential mobility and geographical origins (e.g., Ericson, 1985; Knudson et al., 2005; Price et al., 2002, 2004, 2006; Sealy et al., 1991). This type of analysis is based on the premise that an individual's teeth can reflect the geographic area of childhood residence. Strontium isotope analysis has been used in the Andes to document migration (Andrushko et al., 2009; Conlee et al., 2009; Hewitt et al., 2008; Knudson, 2008; Knudson and Buikstra, 2007; Knudson and Price, 2007; Knudson et al., 2004, 2005, 2009; Knudson and Torres-Rouff, 2009; Slovak et al., 2009; Turner et al., 2009), identify origins of Wari trophy heads (Knudson and Tung, 2007; Tung, 2003; Tung and Knudson, 2008, 2010), and examine Inca sacrifice at Tiwanaku (Knudson et al., 2006).

Radiogenic strontium isotope ratios ($^{87}Sr/^{86}Sr$) in soils and groundwater vary based on the local geological conditions, specifically, the age and composition of subsurface bedrock (Faure, 1986). These ratios are then reflected in the tissues of plants and animals of each region and remain constant throughout incorporation. When these local sources of strontium are consumed by humans, their dental and skeletal tissues reflect the ratios of the local region (Bentley, 2006; Burton et al., 2003; Ericson, 1985).

For strontium isotope analysis, tooth enamel is preferred over bone because it is less susceptible to contamination. Teeth absorb strontium isotopes until tooth crown formation has completed, from fetal stages through the first 12 years of life, depending on the type of tooth. Deciduous tooth crown development begins *in utero* while most permanent tooth crowns begin developing during the first year of life (Hillson, 1996:123–124). Each tooth will preserve the $^{87}Sr/^{86}Sr$ ratio corresponding to geographic residence during crown formation. In contrast to tooth enamel, bone is considered to be more susceptible to diagenetic alteration since groundwater can dissolve and leach the bone mineral component once in the burial environment. Subsequently, elements present in the soil and groundwater can be taken up by buried bones (Nielsen-Marsh et al., 2000). With teeth, the elements that come in contact with tooth crowns seldom penetrate deep into the enamel (Budd et al., 2000).

Fig. 5. Silver male figurine with *Spondylus* shell headdress.

When individuals of a population relocate to another area, strontium isotope ratios of their teeth may differ from local residents (Price et al., 1994, 2004; Wright, 2005). A comparison of these ratios can reveal the presence of foreigners through deviations from the local isotope signature. This local signature is often determined by sampling local fauna that consumed only locally grown foods; for the Andean region, guinea pigs (*cuy, Cavia porcellus*) are frequently used.

Despite the clear utility of strontium isotope analysis for determining residential mobility, the technique does have some limitations. Strontium isotopic variability throughout the Andes is not well understood on both a macro- and micro-regional level, and the areas with known $^{87}Sr/^{86}Sr$ values represent only a fraction of the geologically variable regions of the Andes (see Andrushko et al., 2009; Conlee et al., 2009; Knudson and Buikstra, 2007; and Slovak et al., 2009 for a review of strontium isotope analysis in the Andes). Moreover, many areas may overlap in their signatures due to similar geology; as a result, it is far easier to classify individuals as non-local than to determine, with certainty, their original residence. These limitations as well as concerns regarding contamination and diagenesis must be taken into account when initiating a strontium isotope analysis.

Fig. 6. Gold, silver, and *Spondylus* figurines of human males and llamas.

4.2. Strontium isotope ratio range for the Cuzco region

The Cuzco Valley and the adjacent Vilcanota Valley constitute an inter-Andean basin separating the Andean hills to the south and west and the higher-range slopes to the north and east. The valley floor, formed by the Quaternary Pleistocene-aged San Sebastián Formation, consists of sedimentary gravels, alluvial fan sands, mud flows, extended diatomite, loams, clays, and peats. Within the district of Cuzco, igneous intrusive plutonic bodies of Paleocene origin have been identified. One such complex located north of the city of Cuzco, the Stock of Sacsayhuaman, is characterized by medium-to-coarse fractured gray-green quartz diorite (Salvador and Davila, 1994). Although no strontium isotope values have been published on geologic material from the Cuzco region,

Fig. 7. Offering found adjacent to the child burials with miniature silver and gold headdress ornaments, gold and silver llama figurines, *Spondylus* shell male human figures, a miniature bracelet, and pieces of gold foil.

$^{87}Sr/^{86}Sr$ values for the Arequipa volcanics located just to the south range from 0.70714 to 0.70794 (James et al., 1976:Table 1; Lebti et al., 2006). While geological sources may be used to determine the $^{87}Sr/^{86}Sr$ value of a region, faunal sources are preferred (Price et al., 2002; Sillen et al., 1995). Faunal sources more accurately measure biologically available $^{87}Sr/^{86}Sr$ values, while water and soil sample $^{87}Sr/^{86}Sr$ values do not always have a direct 1:1 relationship with animal tissue.

A preliminary range of strontium isotope ratios ($^{87}Sr/^{86}Sr$) was identified for the Cuzco region as part of an adult strontium study at Choquepukio (Andrushko et al., 2009). The study used dental samples from 59 adults, along with the teeth of eight guinea pigs from Choquepukio and the site of Tipón, located 5 km from Choquepukio. The four Choquepukio archaeological guinea pig teeth produced an average $^{87}Sr/^{86}Sr$ value of 0.70795 (std. dev. = 0.00013), while the four modern guinea pig teeth from Tipón yielded an average $^{87}Sr/^{86}Sr$ value of 0.70826 (std. dev. = 0.00027). Using these faunal values along with a data-outlier approach to the human strontium values, the Cuzco region $^{87}Sr/^{86}Sr$ range was determined to be 0.70728–0.70906 (Andrushko et al., 2009).

Certain foods likely contributed to the $^{87}Sr/^{86}Sr$ values seen in all sampled individuals at Chokepukio. Diets rich in plant sources such as seeds, nuts, and legumes contribute to $^{87}Sr/^{86}Sr$ levels in humans (Price et al., 1994:323). The native Andean diet included maize, potatoes and other tubers, quinoa, camelid and *cuy* meat, peppers, and beans (Rowe, 1946:210). Of these foods, beans constitute the most important source for strontium, because legumes have a high calcium and strontium content (Burton and Wright, 1995:278). Although individuals at Chokepukio may have consumed non-locally grown imported maize, maize consumption does not influence human $^{87}Sr/^{86}Sr$ values, as the crop contains little calcium and strontium (Aufderheide and Allison, 1995). Additionally, while certain marine resources can affect strontium values (Burton, 1996), these resources did not constitute a substantial portion of the local Cuzco diet (Rowe, 1946:220).

5. Materials and methods

The strontium analysis of the seven Choquepukio child burials was conducted at the Radiogenic Isotope Facility, Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton. The samples were prepared for analysis in the Class 100 clean room facility and sonicated for 15 min in Millipore water (MQ) followed by 5% acetic acid for 15 min. After an overnight leaching in 5% acetic acid, the acid was removed and samples were rinsed with MQ prior to transfer to vials. After adding a Rb-Sr spike, the samples were digested in a microwave oven in 4 ml 16 N HNO_3 and 1 ml ~ 10 N HCl. Digested samples were dried overnight on a hot plate (80 °C).

Trace element analysis was conducted on the same samples at the same facility to check for possible contamination. In addition, laboratory preparation for the strontium isotope analysis followed standardized protocol with steps taken to ensure that contamination did not affect the results. Although tooth enamel is much less susceptible to contamination than bone or dentine, we further decreased the possibility of post-depositional contamination by chemically and mechanically cleaning and abrading the tooth surfaces, techniques shown to reduce some diagenetic contamination (Nielsen-March and Hedges, 2000). This study utilized the solution mode for isotopic analysis, which appears to offer a more accurate method for detecting historical migrations than laser ablation (Simonetti et al., 2008). Diagenetic contamination from the burial environment was monitored through uranium concentrations, which should be below the detection limit of the Inductively Coupled Plasma – Mass Spectrometer (ICP-MS). For a complete description of these methods, see Andrushko et al. (2009), Buzon et al. (2007), and Simonetti et al. (2008:373–374).

Strontium isotope measurements were determined using a NuPlasma MC-ICP-MS instrument. Subsequent to ion chromatographic treatment of the samples, the Sr-bearing aliquots were diluted in a 2% HNO_3 solution and aspirated into the ICP torch using a desolvating nebulizing system (DSN-100 from Nu Instruments Inc.). Strontium isotope data were acquired in static, multi collection mode using 5 F collectors for a total of 400 s, consisting of 40 scans of 10 s integrations. The 'wash-out' period following the analysis of a sample was approximately 5 min. Prior to the aspiration of a sample, a 30 s measurement of the gas (+acid) blank was conducted, which is critical for the correction of the ^{86}Kr and ^{84}Kr isobaric (plasma-based) interferences. The isobaric interference of ^{87}Rb was also monitored and corrected for using the ^{85}Rb ion signal; however, the latter was negligible for all of the results reported here. Accuracy and reproducibility of the analytical protocol were verified by the repeated analysis of a 100 ppb solution of the NIST SRM 987 Sr isotope standard during the course of this study; this yielded an average value of 0.710242 ± 0.000041 (2σ standard deviation; $n = 13$ analyses) and is indistinguishable compared to the accepted value of 0.710245 (Faure and Mensing, 2005:78). The typical internal precision ('error') associated with an individual Sr isotope analysis varies from 0.00001 to 0.00003 (2σ level).

6. Results of the Choquepukio child burial strontium analysis

Based on the $^{87}Sr/^{86}Sr$ range for the Cuzco region (0.70728–0.70906), two of the seven children were identified as non-local (Table 1). The first individual (CHO 141) exhibited a $^{87}Sr/^{86}Sr$ value of 0.70910, just above the Cuzco-region range and within the range of the Tiwanaku region of Bolivia (0.7087–0.7105) (Knudson, 2004). The second individual (CHO 142) yielded a $^{87}Sr/^{86}Sr$ value of 0.70638, well below the Cuzco range. Instead, this $^{87}Sr/^{86}Sr$ ratio fell into the range observed for Wari individuals from the Ayacucho region (0.7054–0.7067) (Tung, 2003:80).

The $^{87}Sr/^{86}Sr$ values of the other five children were within the local range, suggesting that they originated from the area around Choquepukio (or a geologically similar area). Two individuals had

Table 1
Strontium isotope and uranium trace element results.

Sample	Age at death (years)	Tooth Analyzed	Age Range Represented by Tooth (years)	Sr ppm	$^{87}Sr/^{86}Sr$	2σ error	Interpretation	Ur ppm[a]
CHO 140	11–12	RI_1	0–4	198	0.70796	0.00002	local	0.04
CHO 141	**8–9**	**RP^3**	**1–6**	**261**	**0.70910**	**0.00002**	**non-local**	<DL
CHO 142	**5–6**	**Ldm_2**	**0–1**	**157**	**0.70638**	**0.00002**	**non-local**	<DL
CHO 143	4–5	RM_1	0–3	152	0.70827	0.00002	local	<DL
CHO 144	5–6	LM^1	0–4	150	0.70783	0.00003	local	<DL
CHO 146	3–4	Rdm_2	0–1	152	0.70809	0.00002	local	<DL
CHO 152	6–7	Rdm_2	0–1	77.0	0.70768	0.00002	local	<DL

[a] DL = detection level; detection level in solution mode is 0.003 for U. Bold values indicate non-local individuals.

values resembling the Choquepukio faunal average (CHO 140, $^{87}Sr/^{86}Sr = 0.70796$; CHO 144, $^{87}Sr/^{86}Sr = 0.70783$), while another individual yielded a value slightly below the average (CHO 152, $^{87}Sr/^{86}Sr = 0.70768$). The final two individuals had values similar to the Tipón faunal average (CHO 143, $^{87}Sr/^{86}Sr = 0.70827$; CHO 146, $^{87}Sr/^{86}Sr = 0.70809$).

The sampled teeth were a mixture of deciduous and permanent teeth (Table 1). For three individuals, the second deciduous molar was used, which resulted in a strontium ratio reflecting the geographic place of *in utero* development, birth, and the first 11 months of life (Hillson, 1996:124). In another case, the first permanent molar was used, representing the individual's geographic origins from birth to age three. For two more children, the sampled teeth were permanent central incisors; the resulting values corresponded to their residences during ages three months to four years. Finally, for the single child whose first premolar was analyzed, the $^{87}Sr/^{86}Sr$ ratio related to the geographic residence during the first to sixth years of life (Hillson, 1996:123).

Trace element data indicated that the results were not influenced by contamination, with the possible exception of one enamel sample (Table 1). The sample from local individual CHO 140 contained 0.04 ppm of uranium, just above the allowable limit of 0.03 ppm (detection limit for the MC-ICP-MS). Uranium, which is not normally found in skeletal tissues, can reflect the uptake of groundwater and may influence $^{87}Sr/^{86}Sr$ ratios (Hedges and Millard, 1995). Contamination of this sort could cause a non-local strontium value to resemble the local signature, but is unlikely to change a local value into a non-local value. As such, CHO 140 could have been a non-local child whose $^{87}Sr/^{86}Sr$ value matched the local signature due to contamination.

7. Discussion

When considered together, the osteological, archaeological, and isotopic evidence suggest that a *capacocha* event occurred at Choquepukio. First, the ages of the Choquepukio children closely match the ages reported in colonial accounts of *capacocha* sacrifices. At Choquepukio, the children ranged in age from 3 to 12 years, with a mean age of 6.5 years. Meanwhile, the Spanish chronicler Betanzos (1996[1557]:132) noted that for the *capacocha* demanded by the Emperor Pachacuti, "[a]ll these children should be from five to six years of age." Another Spanish chronicler, Rodrigo Hernández Principe, described a *capacocha* in which children aged 10–12 years were brought in from the four corners of the empire (Hernández Principe, 1923).

The mortuary treatment also provides evidence for a *capacocha* event. These seven children represent a single interment episode—a significant deviation from the normal burial treatment of children at Choquepukio during Inca times (Andrushko et al., 2006). For 21 other children (0–12 years) buried at Choquepukio during the Late Horizon, interment was usually singly or with an adult. These 21 other children were not segregated in a single locus of the cemetery but rather interred throughout the site, and were rarely buried with grave goods. As a result, the alternate explanation for the special child burial assemblage—that it represents local elite children who died of natural causes—appears unlikely. Rather, their deviation from the normal burial treatment provides additional support for a *capacocha* distinction (Eeckhout and Owens, 2008:381).

In addition, the artifacts found with the grouped children bear a striking similarity to those found at the Ampato *capacocha*. For both sites, gendered human figurines and tiny llama figurines feature prominently (Bray et al., 2005). At Choquepukio, some children were buried with female figurines, while the last child recovered had a 25 cm silver male figurine with a *Spondylus* headdress. At Ampato, Juanita had a female figurine buried with her and the 10-year-old boy had a male statue. Similar gendered figurines were also recovered at *capacocha* contexts on Cerro el Plomo and Cerro Copiapó in Chile and other sites (Benson, 2001:16; McEwan and van de Gutche, 1992:363).

Of particular interest are the origins of the Choquepukio children. Radiogenic strontium isotope results reveal that two of the children originated from outside of the Cuzco region, possibly from the Tiwanaku region of Bolivia and the Ayacucho region of Peru. As the colonial documents note that *capacocha* children were selected throughout the empire, the inclusion of non-local children is not surprising. Perhaps more surprising is the presence of five sacrificed children at Choquepukio who do not appear foreign based on their strontium isotope values. However, some accounts note that children were returned to their homelands for sacrifice after traveling to Cuzco (McEwan and van de Gutche, 1992:360; Reinhard, 2005:30), in which case the presence of local children in the sacrificial context is understandable.

With the totality of evidence for the seven child burials—the ages of the children, the mass grave and exclusion of adults, the elaborate artifacts resembling those from other *capacocha* events, and the strontium results pointing to the inclusion of non-local children—we believe these burials represent a *capacocha* event. In fact, the Choquepukio context mirrors the archaeological expectations put forth by McEwan and van de Gutche (1992:362):

> *The presence of a child's body accompanied by suites of miniature offerings in precious metals, sea shell, and textiles is convincing proof that the final act of sacrifice was carried out at carefully selected locations*…

If so, this is a significant discovery that allows us to increase our understanding of the *capacocha* ritual apart from what is known in ethnohistoric documents. Our findings at Choquepukio, along with those from recent archaeological discoveries, show that a *capacocha* could vary by number and age of victims, type of grave goods, and location. Such variability may relate to the fact that some *capacocha* rituals were initiated at the village level, while others were enacted at the level of the state (McEwan and van de Gutche, 1992:362). The discovery at Choquepukio illustrates that *capacocha* events were not restricted to high-altitude environments, but rather were carried out at a variety of elevations throughout the Inca Empire.

The osteological evidence does not indicate how the children died. This may be due to the poor preservation of the skeletal remains, masking any indication of trauma, or it may be due to the specific way in which the children were sacrificed. Children were frequently strangled as part of the *capacocha* ritual (Cobo, 1990 [1653]), which would not have left any mark on the bones. The hyoid bone, which is often fractured when adults are strangled, rarely fractures in children because it is unfused (O'Halloran and Lundy, 1987). Consequently, children in Inca sacrificial contexts rarely show physical evidence for cause of death (Verano, 2001:168).

Why was Choquepukio chosen as a site for the *capacocha*? One possible explanation lies in the historical importance of the site. Prior to the rise of the Inca Empire, during the Late Intermediate Period (AD 1000–1476), the Pinagua ethnic group had their center of political power at Choquepukio. Together with another group, the Ayarmaca, they controlled the Lucre Basin and territory to the east of Cuzco as well as territories to the north (Hiltunen and McEwan, 2004:246; McEwan et al., 2002:292). The Pinagua constructed monumental niched temples at Choquepukio for purposes of feasting and forming alliances, as inferred from architecture and associated luxury items (McEwan et al., 1995). In later Inca times, Choquepukio's distinction as a powerful ancient site would have imbued it with ceremonial value, since the Inca venerated locations of historic significance (Bauer, 1998; Bray et al., 2005:87). Such ceremonial value may have contributed to Choquepukio's selection for the *capacocha* event.

A second possible explanation lies in Choquepukio's geographical location on the sacred landscape (Swenson, 2003:276). For the Inca, points of intersection (*tinkuy*) held symbolic importance, such as the confluence of two roads or two rivers. Choquepukio lies close to the intersection of the Huatanay River and the Collasuyu Road, one of four Inca roads originating in Cuzco, and both the Huatanay River and the Collasuyu Road were associated with the supreme Inca deity Viracocha. It is therefore possible that Choquepukio's geographical position as a point of intersection conferred a ritual significance to the site.

A third explanation concerns the warm natural spring that flows out from beneath the hill on which Choquepukio sits. A warm spring would have been an important and powerful *huaca*, a sacred object or place on the landscape (Bauer, 1998; Van de Gutche, 1999). The Incas would have desired to propitiate the supernatural spirit embodied by the spring and this could explain the location of the sacrifice.

Given the profound significance of the *capacocha* ritual, the occurrence at Choquepukio suggests an important religious event in the history of the site. Since five of the seven children seemingly came from the local area, the communities around Choquepukio would have sacrificed their most precious assets to reinforce their loyalty to the Inca Empire. As McEwan and Van de Gutche (1992:364) note, sacrificed children epitomized the health and perfection of the young and served as representatives of their communities. Following the sacrifice at Choquepukio, this section of the site appears to have remained a sacred space for Inca religious rituals, with an Inca building constructed over the preserved burial context of the seven children.

8. Conclusions

Our study investigates a possible *capacocha*, the Inca ritual of child sacrifice, at the site of Choquepukio in the Valley of Cuzco, Peru. The 2004 discovery consists of seven children buried together with a large assemblage of luxury artifacts, including gold and silver miniature human figurines, red *Spondylus* shell figurines, gold, silver, and bronze *tupu* pins, and several sets of Inca imperial ceramic vessels. This type of mortuary treatment deviates from other child burials at Choquepukio, suggesting that the burial assemblage does not represent local children who died of natural causes. The strontium isotope results further indicate that two of these children were non-local. When considered together, the osteological, archaeological, and isotopic evidence suggest that a *capacocha* event occurred at Choquepukio.

The findings at Choquepukio accord with descriptions from Spanish chronicles regarding the sacrifice of children at lower-elevation locations, such as at the Temple of the Sun in Cuzco. However, our recent knowledge of *capacochas* has derived mainly from the spectacular high-altitude findings on several Andean mountain peaks. Given the findings presented here along with the descriptions from Spanish chronicles, it is important that researchers no longer restrict their definition of the *capacocha* to high-altitude events.

This study reinforces that the *capacocha* was an important aspect of Inca religion and further illustrates the variability within this ritual regarding the number and ages of children sacrificed, location of sacrifice, and types of offerings included in the graves. The study also challenges the supposition that sacrificed children always originated from diverse regions of the empire. Our study suggests that local children were mostly sacrificed, although two non-local children were included in this ritual.

Finally, this study highlights the importance of isotope analysis in investigating archaeological contexts of human sacrifices. A growing number of studies (Fernández et al., 1999; Knudson et al., 2006; Price et al., 2007; Tung and Knudson, 2010; White et al., 2007, 2002; Wilson et al., 2007, among others) have contributed significant information regarding the geographic origins and pre-death treatment of sacrificial victims. In the case of Wilson et al. (2007) study, hair samples from four mummies including the 15-year-old "Llullaillaco Maiden" and the 7-year-old "Llullaillaco Boy" indicate that the children's diets changed markedly in the twelve months before their deaths, suggesting they were fed more "elite" foods in preparation for sacrifice. In addition, isotopic changes found in their hair samples indicate that the children began their pilgrimage to the mountains three to four months before they died. As evident from these studies, archaeological chemistry techniques now enable us to document with detail an intriguing phenomenon—the practice of human sacrifice—that held great importance for many ancient civilizations.

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