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J. Marla Toyne
University of Central Florida

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INTERPRETATIONS OF PRE-HISPANIC RITUAL VIOLENCE AT TUCUME, PERU, FROM CUT MARK ANALYSIS

J. Marla Toyne

Archaeological residues of ritual are often ephemeral, and reconstructing the dynamics of performed actions that create deposits can be difficult. Rituals associated with the dead are common across many cultures since all human groups have specific means of disposing of corpses. Evidence of peri- and postmortem manipulation of human remains, such as cutting, dismemberment, or disarticulation can provide details of the sequence of actions performed related to the circumstances surrounding death and the possible social meaning of those behaviors. Cut marks observed on the upper chest and throat of 93 percent of 117 children and men found interred at the Temple of the Sacred Stone at Túcume, Peru are consistent with three symbolic behaviors: cutting the throat, opening the chest cavity, and decapitation. This patterning of skeletal trauma demonstrates that a highly elaborate series of violent ritual behaviors was carried out on a regular basis at this location, beginning in the Late Intermediate Period (~A.D. 1100) through to the end of the Late Horizon Inca occupation of the site around A.D. 1532. The recent finds of bioarchaeological evidence of ritual violence across the Andes suggests that, although rare, these mortuary remains provide important clues to the elaborate nature of ritual behaviors at different sites.

Los contextos de sacrificios humanos son poco frecuentes en la arqueología, y generalmente es difícil interpretar las acciones rituales que los originaron. La manipulación peri y postmortem de estos restos humanos nos proporciona información referente a complejas ceremonias y su significado social. Las huellas de corte observadas en la parte superior del pecho y garganta en el 93 por ciento de los 117 niños y hombres jóvenes, hallados en el Templo de la Piedra Sagrada en Túcume, Perú, son consistentes con tres comportamientos simbólicos: degollamiento, apertura de la cavidad torácica y decapitación. Este patrón de trauma óseo demuestra que una serie elaborada de violentas acciones rituales fue llevada a cabo regularmente en este lugar, empezando en el Período Intermedio Tardío (ca. 1100 d.C.) hasta el final de la ocupación Inca en el sitio, hacia el Horizonte Tardío alrededor de 1532 d.C.

Human sacrifice is a powerful tool. It demonstrates an individual's or collective's control over life and death and often serves to connect these biological realities in a perpetuate cycle related to social renewal (Moore 2004; Swenson 2003). The long history of ritualized violence in the archaeological record in the South American Andes demonstrates that pre-Hispanic societies were cognizant of this potential.

Archaeologically, conclusive evidence of sacrificial or ritually motivated deaths is rarely encountered. In the Andes, there is an ancient tradition of iconographic representations of decapitator deities holding blades and disembodied heads (Carmichael 1995; Cordy-Collins 1992). Frequently, human burials or isolated remains not found in cemeteries are interpreted as sacrificial offerings, either to ded-

icate architecture or to accompany deceased individuals (Eeckhout and Owens 2008; Gaither et al. 2008; Verano 1995). Often these remains lack clear evidence that they were killed or treated differently than other dead members of the community, except for their distinctive burial location. In the early historic sixteenth and seventeenth centuries, written documents describe elaborate prehispanic Inca rituals including human and animal sacrifices (Cieza de León 1963 [1538]; Cobo 1990 [1653]). Unfortunately, there is little archaeological evidence to corroborate these Inca religious activities. Did they actually happen, or do they represent a barbarous Inca world, as described by literate foreign invaders, or an idealized past recounted by indigenous descendants? Although there are seeming archaeological parallels (Bourget 2001; Hocquenghem

J. Marla Toyne ■ University of Central Florida, Department of Anthropology, 4000 Central Florida Blvd., Howard Phillips Hall Room 309, Orlando, FL 32816-1361 (j.marla.toyne@ucf.edu)

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2009), we cannot transpose these beliefs and behaviors directly onto earlier extinct cultures in different regions of the Andes. However, these indirect sources of past ritual life remain valuable tools. More recent work by Verano (1995; 2001a; 2005; 2007) on the north coast of Peru has identified uncontested physical evidence of ritual death and complex corporeal mutilation among some early pre-Hispanic societies.

This paper uses bioarchaeological indicators of perimortem manipulation and postmortem treatment of the victims to identify distinct types of ritual activities. These patterned behaviors reflect specific sacrifice practices, including bloodletting, organ extraction, and decapitation. The remains from the Temple of the Sacred Stone at Túcume provide physical evidence of ritual behaviors associated with human sacrifice, whose meaning can be explored through an understanding of Andean symbolic ideology and religious traditions.

Ritual Violence

Reconstructing ritual behaviors in the archaeological record is a challenge, as the sacredness of rites is created through shared social action and beliefs, which are not directly preserved. Even though rituals can be difficult to identify, archaeologists can use pattern recognition and symbolic features to locate ritual spaces and residues of activities performed there (Andrews and Bello 2006; Kyriakidis 2007; Renfrew 1985). Rituals, defined as formal social acts based on traditional beliefs that function to create communication between the human world and the spirit or supernatural world, play important roles in creating social cohesion and reinforcing power structures (Douglas 1972; Bell 1997; Hastorf 2001).

Even with the symbolically motivated behavior associated with human burials, the complexities of pre- and post-funerary rites may not be fully represented in cemetery contexts (Buikstra and Nystrom 2003). Archaeologists can identify particular spaces as loci of symbolic and ritual performance based on specific features including architecture (temples, special walkways, etc.) and the placement of ritual symbols and objects (Inomata and Coben 2006; Moore 2004; Silverman 1994).

Sacrifice is a particular type of complex ritual action that involves offering something of value

within a symbolic system (Turner 1977). Offerings are usually destroyed or transformed in some way so that they become accessible to the supernatural world. Valeri (1985:37), for example, defines sacrifice as “any ritual action that includes the consecration of an ‘offering’ to a deity” and in which the offering is made of “one or more individuals belonging to a species with symbolic values exploited in the course of the ritual”. A sacrificial offering is made as a means of communicating with supernatural forces in an attempt to influence them on behalf of human societies by giving with the hope of receiving in kind (Hubert and Mauss 1964[1898]).

The human body is a complex organism and can be transformed in a ritualized manner to reflect significant social meaning (Sofaer 2006). Individual human products such as blood, semen, or body parts can be sacrificed, but human life is considered the most valuable of sacrifices (Valeri 1985). Death can be administered in many ways but the additional manipulation of the body and its parts may have specific symbolic meaning that can be inferred from the cultural context.

Ritual Death in the Andes

Ritually motivated violence, including sacrifice, falls under the category of socially sanctioned actions, where individual deaths are conceptually acceptable within a particular context. Ritual death can be a religious act involving reciprocal exchange between humans and the gods (Bloch 1992) or an act of political power that reinforces social order and hierarchy (Kertzer 1988). In the Andes, where human sacrifice may have been practiced for thousands of years, researchers suggest that these two purposes are not necessarily mutually exclusive (Arnold and Hastorf 2008; Ramírez 2005).

Ceruti (1999), for example, explains Inca child sacrifices on mountain summits in terms of the theory of social conflict. She argues that the ritual of human sacrifice, while still serving a religious function, played an important role in Inca conquest and domination of distant territories but may also have served local resistance strategies. Swenson (2003) also contends that as early as the Early Intermediate Period, the Moche had a social structure in which it was difficult to separate displays of political power from ritual performance. Moche fine-line paintings depict the cups of human sacrificial

blood being presented to elaborately dressed individuals on elevated platforms. Only certain individuals had the right or privilege to accept the sacrificial blood reflecting elite control of ritual offerings (Arsenault 2001).

Ritual violence in the Andes has been identified in various forms, including dedicatory sacrifices or retainer burials (Verano 1995), prisoner sacrifice (Verano 2001b), and taking of trophy heads in either military or ritual events (Forgey and Williams 2003; Tung 2008). Verano (2001b; 2005) and Bourget's (2001) work at the Early Intermediate Period (A.D. 100–800) site of Huacas de Moche on the north coast in the Moche Valley have brought to light an important example of manipulation of a large number of human bodies in complex and symbolic ways associated with ritual structures. A detailed analysis of the cut mark morphology and patterning by Hamilton (2005) investigated the tools and techniques used in human sacrifice during Moche times. She analyzed the skeletal evidence for systematic throat-slitting, defleshing, dismemberment, decapitation, and trophy-taking related to ritual prisoner sacrifice. While victims were always young adult men, there was variation in treatment and thus ritual practice over time (Verano 2009). These studies and others (Klaus et al. 2010; Verano and Toyne 2004) demonstrate the importance of detailed skeletal analyses of perimortem trauma and mortuary analysis in determining the events surrounding death.

Archaeological Context

On the Pacific coast of modern day Peru, the environment is rich in well-preserved archaeological sites, especially on the arid coastal plain west of the Andean Mountains (Figure 1). Túcume is a large archaeological complex located in the north within the larger Lambayeque River Valley Complex. The site is identifiable in the flat surrounding landscape due to the prominence of the natural rock outcropping of Cerro La Raya. The 26 large *huacas* or platform mounds of mud bricks encircle the *cerro*, creating a ceremonial and administrative core.

Monumental construction occurred during the earliest Lambayeque (also known as the Sicán culture [Shimada 2000]) occupation around A.D. 1000–1100 (Narváez 1995a). Around A.D. 1350,

the site was incorporated into the Chimú Empire, which expanded from the south to control almost the entire northern coastal region. In approximately A.D. 1470, the Inca conquered the region, leaving clear evidence of their presence at the site. Finally, in A.D. 1532 the Spanish arrived on the northern coast of Peru and the site was burned and abandoned soon after (Cieza de León 1984 [1553]). Of the twenty-six platforms, those excavated reveal evidence of both elite residential and ceremonial architecture on their summits, suggesting that political and religious authority were linked and that the site was administered by a powerful minority (Narváez 1995a).

Evidence of these three distinct cultural occupations (through distinct offerings and structural modification) is found at the Temple of the Sacred Stone (TPS), located just east of the base of the largest platform mounds (Narváez 1995a). There is a large, vertically implanted, stone enclosed within its walls. This one-ton monolith of volcanic basalt rock quarried from the *cerro* directly behind it. Its position and orientation suggest that it represents a scaled-down version of the *cerro*, or even the massive Andean mountains further to the east. Traditional Andean beliefs hold the mountains as sacred ancestors who have powerful influence over daily existence. The peaks are the source of both the sun rising from the east and the rivers that bring water to irrigate coastal agricultural fields (Allen 1988; Bolin 1998; Tierney 1989). Prehistorically, mountains also appear to have been revered as important sources of supernatural power by both highland and coastal peoples (Ceruti 2001; Zighelboim 1995). Early Moche built a patio on Huaca de la Luna to include a natural rock outcropping within that sacred space (Bourget 1997; Uceda 1999). Some monolithic stones, called *huancas*, were regarded as lithified ancestors to whom regular offerings were made beginning perhaps as early as the Preceramic (Shady 1997) through Incan times (Duviols 1979).

Offering caches from Chimú and Inca occupations were found within the Temple structure, including thousands of miniature gold and silver artifacts in the shape of elite objects of power. Small human figurines called *conopa* are also included as offerings. These are best known from their direct association with Inca high-altitude child sacrifices in the southern highlands (Reinhard 2005). The



Figure 1. Map of Peru indicating the location of sites mentioned in the text.

only other sites where these special offerings have been found include the sacred precinct of Pachacamac on the central coast; La Plata Island, off the coast of Ecuador; and around Lake Titicaca (Dorsey 1901; McEwan and Van de Guchte 1992). All were prominent pre-Inca religious shrines. These miniatures re-enforce our understanding of the Temple as a sacred and symbolic location where offerings of valuable objects were interred over an extended

period of time. Since the Temple at Túcume is quite small (8 m²) and the patio area in front is enclosed, this ritual space may have been restricted to elite ceremonial functions.

Burial Context

Our excavations in 2005 focused on a 117 m² enclosed patio area directly in front, and to the east, of the temple entranceway where earlier investiga-

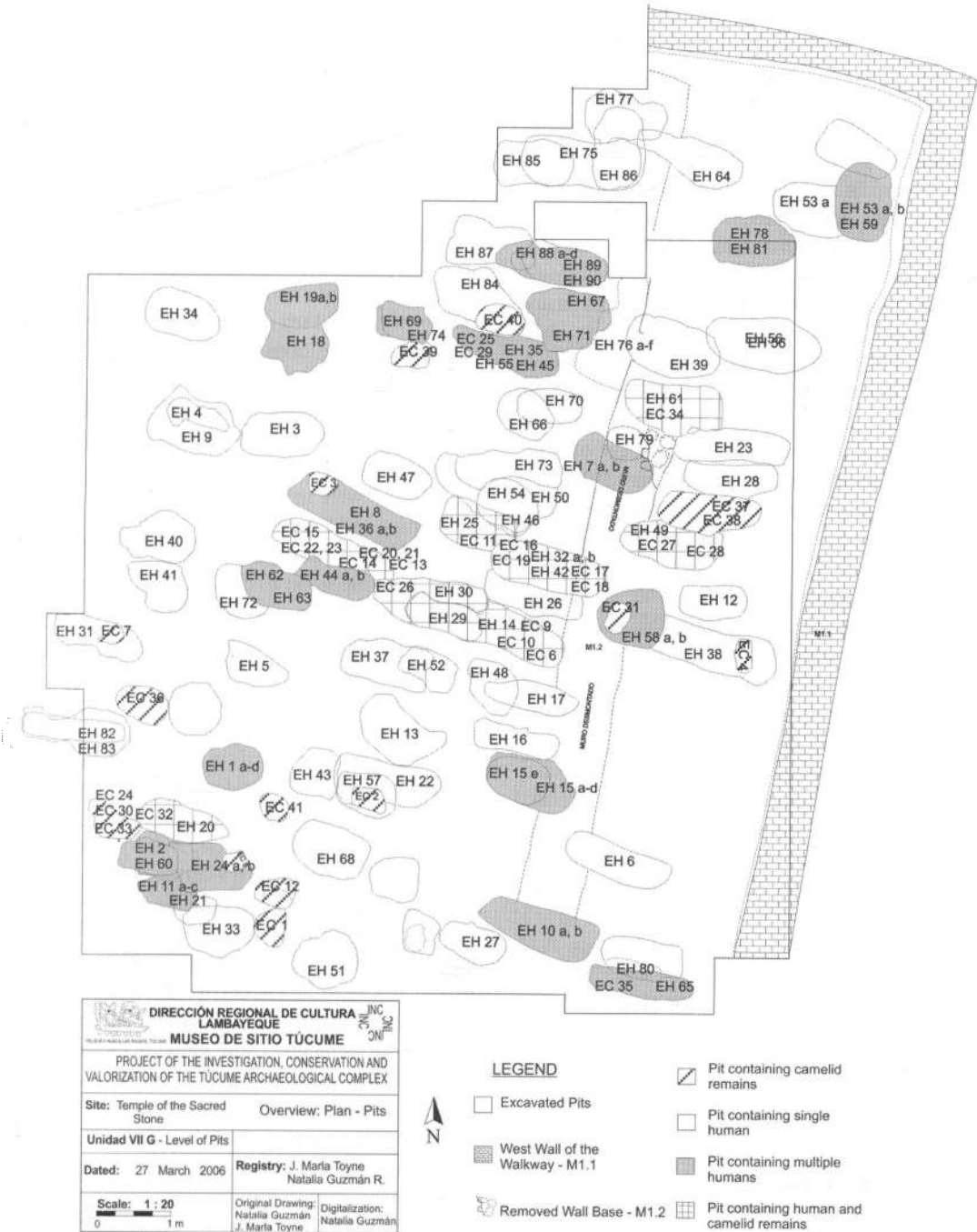


Figure 2. Plan drawing of burials in the patio directly to the north of the Temple of the Sacred Stone's entrance.

tions had uncovered a small number of human and camelid remains (Narváez 1995b; Toyne 2009). Excavations focused on determining the extent and nature of the burials associated with the temple and interpreting the patterns in mortuary behavior.

Skeletal remains including a minimum of 110 humans (adults and subadults) and approximately 41 juvenile camelids (*Llama* sp.) were recovered (Figure 2). There were seven other sets of human skeletal remains from earlier excavations for a total

of 117 individuals. Due to variable preservation, however, only 95 were observable for detailed osteological analysis. The burials were primary depositions but occasionally pits were disturbed, either partially or completely, by subsequent interments, resulting in some incomplete and disarticulated skeletal remains. The original pit occupant's skeleton was often reintegrated into the pit fill on top of the newly deposited individual. Many graves contained multiple individuals, each representing a separate burial event and pit reuse. Figures 3a and 3b demonstrate how, in pit 54, one individual (EH67) was placed supine, with his legs crossed, on top of the skeletal remains of EH71 (also supine, legs crossed). However, at the time of EH67's interment, EH71 was already skeletonized and only the right forearm (radius and ulna) and part of the right hand were disturbed. Based on the number of remains and stage of decomposition and disarticulation, estimates predict bodies could skeletonize in their burial environment in as little as a couple months to a couple years (Galloway et al. 1989; Nelson 1998; Toyne 2009). Estimates therefore could allow up to a possible maximum of 100 years of sacrificial use if an annual event, although the timeframe may be narrower.

Surface erosion and superposition created challenges for dating some of the burials. We correlated the patio occupational surfaces to the archaeological floors and chronology described for the temple (Narváez 1995b). Radiocarbon dating of the Temple floors indicates that a few burials ($n = 5$) date to the Chimú Phase (~A.D. 1350 to A.D. 1470), although most ($n = 29$) date to the later Inca occupation (A.D. 1470 to A.D. 1532) (Toyne 2009). One human burial was dated to 680 ± 40 B.P. (Beta 213693; bone collagen), or cal A.D. 1270–1230 or cal A.D. 1340–1390 (calibrated at 2σ with the program CALIB 3.2 [Stuiver et al. 1998]).¹ It appears that human sacrifices began during the Chimú occupation and continued into the Inca occupation; conquest by these two foreign sociopolitical powers appears to have had little impact on the sacred nature of the Temple of the Sacred Stone. Valuable offerings to the temple began during the Late Intermediate Period Lambayeque occupation around A.D. 1000, but with the Chimú evolved to include human lives.

Materials and Methods

The bioarchaeological approach integrates both mortuary data and biological aspects of human skeletal remains (Larsen 1997), and creates a contextually based interpretation (Buikstra and Beck 2006). The burial analysis included recording characteristics of pit dimensions, orientation, depth, and contents as well as body and limb placement, positioning, and orientation within the pit.

Skeletal remains were used to construct victim profiles of age and sex, physical morphology, and pathological conditions based on accepted standards (Buikstra and Ubelaker 1994; Ubelaker 1989). These profiles serve to reconstruct the biological life histories of the individuals and allow interpretations of victims' identity. Ritual activity "signatures" were modeled based on the location, distribution, and extent of surface modification (i.e., cut marks and perimortem fractures) on bones. It is important to consider the relationship of the cut marks to overlying soft tissue structures and the orientation and force applied to create these incisions. Since the overlying soft tissues were not preserved, it is possible to underestimate the degree of manipulation.

Methods used to record cut mark frequency and distribution included: (1) calculating the number of skeletal elements with cut marks; (2) calculating the number of individuals with cuts; and (3) illustrative recording of the anatomical location of cuts. All cut marks were observed using both the naked eye and a 10x hand lens. The skeletons represented varying degrees of completeness (100 percent, $n = 57$; >50 percent, $n = 31$; < 50 percent, $n = 22$) and therefore observations were based on total number of observable skeletal elements. Those individuals that were disturbed often had bones missing but we also identified three large clusters of disarticulated, mixed skeletal remains that may have been "clean up" pits containing possible matches to missing elements from nearby, only slightly disturbed contexts (including bones with cut marks). No specific skeletal element was underrepresented in a way that would suggest trophy collecting.

Counts of cut marks can be subjective since a single stroke may "skip" a section of bone leaving two separate marks with an untouched area between them. Where it was possible to identify a continuous stroke with a skip, a single cut mark was

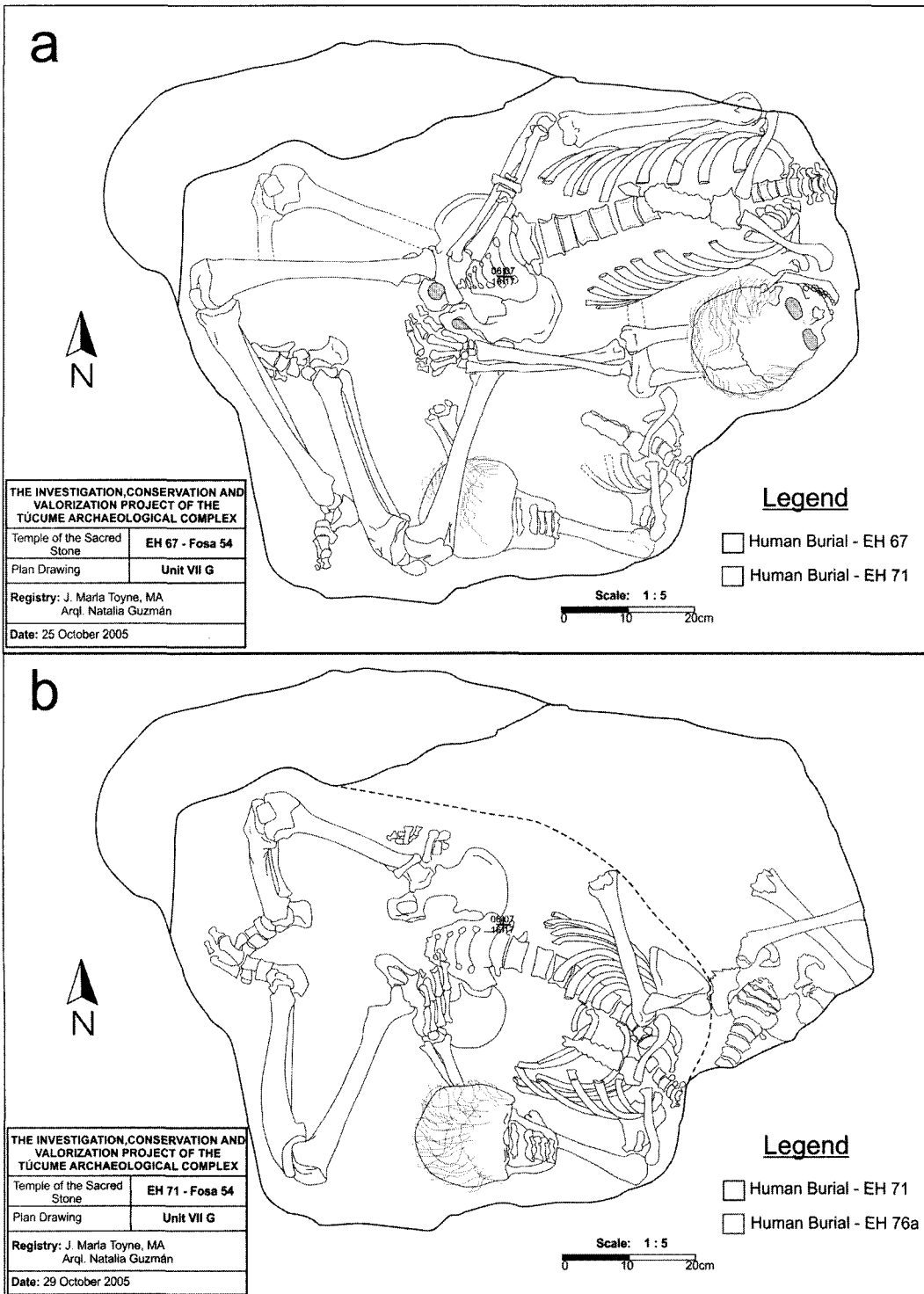


Figure 3. (a) Illustration of burial positioning with the legs flexed and arms across the body of EH 67 and only part of EH71 below exposed in bottom right corner. (b) Illustration of EH71 once EH67 had been removed. Notice the similar body position but the missing right radius and ulna, and the partially disturbed bones of the right hand. Note the crania of both individuals are not articulated or in their correct anatomical position.

counted. In most cases, individuals with multiple cuts had numerous parallel incisions that were clearly the result of separate strokes or sawing back and forth across the same area.

Results

Body Treatment. The human bodies were supine, head to the east, feet to the west (except in one case where the head was towards the north). Where body position could be determined, some individuals were extended ($n = 22$) and others had their legs flexed tightly to their bodies ($n = 20$), or legs crossed and flexed ($n = 30$) (Figure 3a and b), with arms placed beside or across the torso. Even when the head had been separated from the body, it was placed within the pit approximately in anatomical position. There was a significant difference between adult and child burial positions ($\chi^2 = 6.876$, $df = 1$; $p = .032$), where adults were more likely to have their legs flexed or crossed, and subadults were more often extended. This suggests pit length may have been a factor in determining burial position, (most pits averaged 1.13 cm [$\pm .39$] in length) rather than any other symbolic or cultural determinate. The distribution of adults and children burials is generally even across the patio. While it appears there are more adults in the northeast quadrant furthest from the Temple entrance, this relationship does not reach significance ($\chi^2 = 7.786$, $df = 3$, $p = .051$).

Notably there were no artifacts directly associated with individual burials. There was evidence that each body (including camelids) was wrapped in a single simple shroud of woven cotton, though these were very poorly preserved and often only the imprint remained. Scattered on the floors within the patio area, we found two complete *Spondylus calcifer*² shells that were broken in half, a few isolated fragments of *Spondylus*, a copper plate (likely from an article of clothing), a ceramic *crisole* (small pinch-pot clay vessel likely used for the offerings of chicha beer) and a small *Conus* sp. shell carved in the shape of a fish. Each of these artifacts has direct connections to ritualized activities (Costin 1999; Narváez 1995a).

Demography. Age distribution of the sample included subadults ($n = 47$, 42.7 percent) as young as four or five years of age and adults ($n = 63$, 57.3 percent) as old as 50 years of age (Table 1). All the

Table 1. Distribution of Age Estimations.

| Age Estimation | n | % of Sample |
|------------------------------|-----|-------------|
| Young child (2-4 yrs) | 0 | 0% |
| Older child (5-9 yrs) | 12 | 10.9% |
| Young adolescent (10-13 yrs) | 22 | 20.0% |
| Older adolescent (14-19 yrs) | 13 | 11.8% |
| Young adult (20-34 yrs) | 45 | 40.9% |
| Middle adult (35-44 yrs) | 16 | 14.5% |
| Older adult (45-60 yrs) | 0 | 0.0% |
| Adult indeterminate | 2 | 1.8% |
| Total | 110 | 100.0% |

adults and older adolescents were male, except for two disarticulated burials of adult females (one middle-aged adult and one adult of unknown age), who are not included in this analysis as they appear to be secondary offerings and were treated distinctly.

Perimortem Trauma. Surface modification of bone is consistent with perimortem sharp force trauma, where the cuts were made at or around the time of death with no evidence of healing. There were a total of 267 skeletal elements with evidence of cut marks from 95 individuals complete enough for observation. These were located on thirteen separate bones of the upper chest and neck region, including the first through seventh cervical vertebra, first thoracic vertebrae, both clavicles, both first ribs and the manubrium portion of the sternum (Table 2a, Figure 4a and b).

Cuts were made perpendicular to the surface of the bones (Figure 4a) and were very fine incisions with straight, parallel margins suggesting the use of a thin, single-edged implement (Walker and Long 1977). In some cases, enough force was applied to completely bisect elements in a single stroke (Figure 4b). No knives or cutting implements were found at the site, but an analogy can be made with Hamilton's (2005) data, suggesting these cuts were likely made by a long, beveled-edge, metal instrument. From other prehispanic north coast contexts, we know there were crescent-shaped metal blades called *tumi* knives associated with sacrificial activities and severed heads (Cordy-Collins 2001). In only one case at the temple is there clear evidence of perimortem serrated-cut mark margins more consistent with a stone implement with an irregular flaked edge, and these were found on the neck vertebra of an isolated severed head found in a post hole within the temple entrance way (Narváez 1995a:113).

Table 2. Distribution of Cut Marks by Skeletal Element and by Individuals.

| Skeletal Element | A. Skeletal Elements Cut | | | | B. Number of Cut Marks | | | | C. Percent of Individuals Cut | | | |
|------------------|--------------------------|-------------------------|----------------|-----------------------|------------------------|----------------------------------|--------------------------|-------------------------------------|-------------------------------|--------------------------------------|---|-------------------------------|
| | Total # of elements | # of elements with cuts | % of bones cut | # of cuts per element | Average # per element | # of cut marks on adult elements | Average cuts per element | # of cut marks on subadult elements | Average cuts per element | % of Adults (n = 49/52) ^a | % of Subadults (n = 40/43) ^a | Fisher's Exact Test (p value) |
| C1 | 76 | 5 | 6.6% | 45 | 9.00 | 15 | 7.50 | 30 | 10.00 | 4.8% | 8.8% | .651 |
| C2 | 78 | 31 | 39.7% | 287 | 9.57 | 188 | 11.06 | 98 | 7.54 | 40.5% | 37.1% | .813 |
| C3 | 73 | 37 | 50.7% | 209 | 5.81 | 153 | 6.38 | 49 | 4.08 | 63.2% | 35.3% | .033* |
| C4 | 84 | 26 | 31.0% | 114 | 4.75 | 75 | 5.00 | 35 | 3.89 | 35.7% | 22.5% | .336 |
| C5 | 78 | 13 | 16.7% | 46 | 3.54 | 25 | 3.57 | 21 | 3.50 | 17.1% | 16.2% | 1.000 |
| C6 | 77 | 7 | 9.1% | 22 | 3.14 | 20 | 4.00 | 2 | 1.00 | 12.5% | 5.4% | .433 |
| C7 | 78 | 7 | 9.0% | 15 | 2.14 | 10 | 2.50 | 5 | 1.67 | 9.8% | 8.1% | 1.000 |
| Right Clavicle | 84 | 19 | 22.6% | 79 | 4.65 | 46 | 4.18 | 27 | 4.50 | 23.9% | 16.7% | .584 |
| Right 1st Rib | 87 | 32 | 36.8% | 92 | 2.88 | 63 | 3.15 | 29 | 2.42 | 43.5% | 29.3% | .189 |
| Left Clavicle | 90 | 37 | 41.1% | 123 | 3.51 | 44 | 3.38 | 71 | 3.23 | 28.3% | 52.4% | .029* |
| Left 1st Rib | 83 | 18 | 21.7% | 45 | 2.50 | 30 | 3.00 | 15 | 1.88 | 23.8% | 19.5% | .589 |
| Manubrium | 83 | 33 | 39.8% | 143 | 4.47 | 116 | 5.27 | 23 | 2.30 | 50.0% | 26.3% | .041* |
| T1 | 88 | 2 | 2.3% | 6 | 3.00 | 2 | 2.00 | 4 | 4.00 | 2.1% | 2.5% | 1.000 |
| Total | 1059 | 267 | 25.2% | 1226 | 4.75 | 787 | 5.21 | 409 | 3.82 | 37.1% | 27.8% | |

^a Number of individuals based on those with these observable skeletal elements.

* p < .05

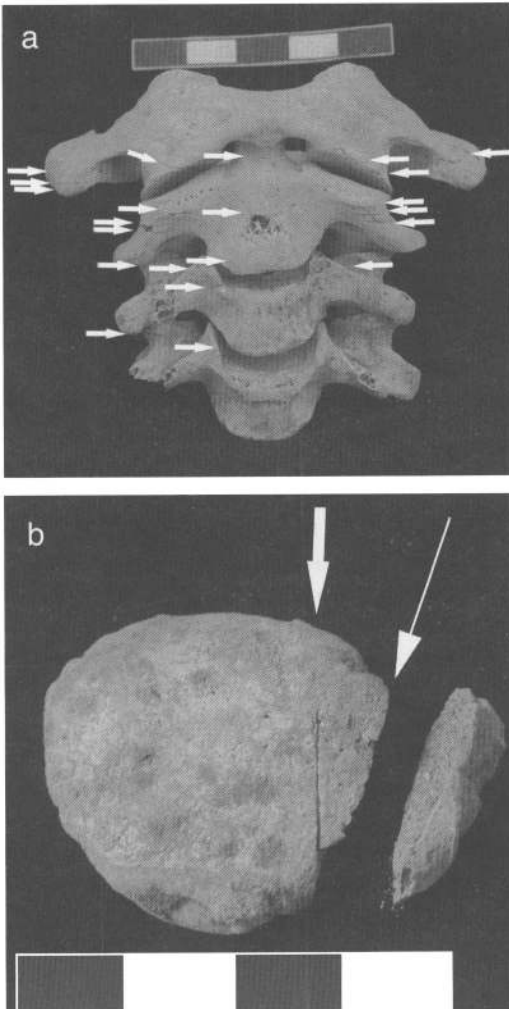


Figure 4. Images of skeletal elements with cut marks indicated: (a) EH39 (adult) upper cervical vertebrae C1 through C4 with multiple cuts (indicated by arrows) across the anterior surface of the bodies, articular facets and dens process; (b) EH16 (subadult) manubrium bisected vertically across left side with a single stroke.

Although some skeletal elements demonstrated only a single cut, most bones demonstrated numerous cuts (Table 2b). The most frequently struck element was the third cervical vertebrae (50.7 percent), followed by the left clavicle (41.1 percent). The left clavicle was also the element most likely to be cut multiple times.

In this sample, 89 out of the 95 individuals with neck and upper thoracic skeletal elements have cut marks present (93.7 percent), and there is no difference in their number and frequency between adults (94.2 percent) and subadults (93.0 percent).

There was minor variation in the distribution of cuts in that the third cervical vertebrae and manubrium were struck more frequently for the adults and the right first rib for the subadults (Table 2c). Only six individuals lacked evidence of cut marks even though they were interred in the same manner as all the mutilated individuals. It is possible to cut the throat of an individual without striking the bone and therefore this activity may be underrepresented. At the same time, other methods of killing such as poison, strangulation, or being buried alive are also associated with sacrificial practices (Besom 2009; Reinhard 2005).

Additionally, there were *perimortem* fractures (complete and incomplete) of the first and occasionally second ribs near the surgical neck (first ribs $n = 48$ of 87, 54.0 percent). There was only a single fracture per element. Although both sides were broken, the right was fractured more frequently than the left ($\chi^2 = 6.02$, $df = 1$, $p < 0.02$). There was no statistical difference in breakage patterns between the adults ($n = 28$) and subadults ($n = 20$).

Discussion

Anatomical Interpretation

The location of cut marks indicates three separate activity signatures: cutting the throat, severing the head from the neck, and opening the chest cavity (Figure 5). The cut mark morphology and fractures are consistent with *perimortem* insults when the bone was vital or recently vital. Sharp force trauma to any of these areas would have been fatal and thus a possible cause of death.

Throat Cutting. Cut marks predominate across the bones at the base of the neck (first ribs, clavicles, and cervical vertebra) and are consistent with deep horizontal slicing across the base of the anterior throat. The knife struck the bones to either or both sides of the neck (first ribs and clavicles), which suggests a wrap-around stroke from shoulder-to-shoulder. Incisions across the anterior surfaces of the cervical bodies require deep penetration, and likely severed many of the major structures of the throat – including the carotid artery, jugular vein, esophagus, trachea, etc. If either of the large blood vessels were cut, there would be massive and rapid blood loss. It is likely that drawing and collecting large quantities of blood (thus

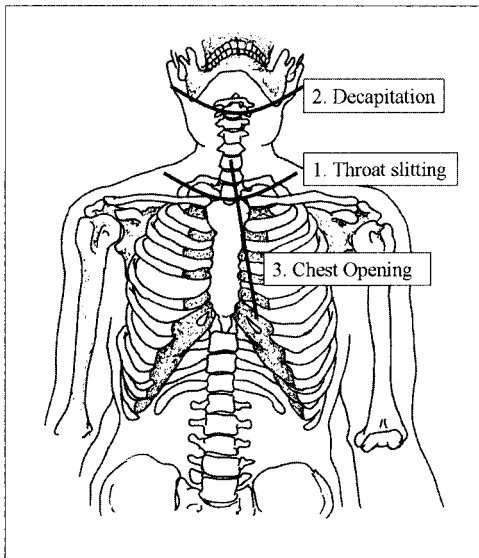


Figure 5. Illustration of human skeleton upper thorax with three activity signature indicating trajectories of cut marks across specific skeletal elements.

killing the victim) was the objective of cutting the throat.

When cuts were identified across the upper neck region but the skull was still in correct anatomical position, it is presumed that the intention was to cut the throat and not decapitate the individual. Remarkably, when the head is in the fully extended position the sternocleidomastoid muscles shift and provide a shield over the vital structures of the throat along the base and side of the neck (Snell 2003). A single stroke over the surface of the neck in this position would likely not be fatal as the carotid or jugular blood vessels would not be damaged. Therefore, if the head were in an extended position, additional cuts or greater force would be required to bisect the covering muscle and soft tissue structures. The multiple incisions and depth of penetration found at the Temple could reflect the body positioning of the victims, head back, either kneeling or supine, during the sacrifice ceremony (Figure 6).

Opening the Chest Cavity. A predominance of cuts ran vertically and ventrally close to the midline of the chest. Many of these cuts struck the proximal ends of the clavicles and frequently bisected the manubrium, usually to one side or the other, and based on their trajectory would have



Figure 6. Chimú period (A.D. 1000–1470) ceramic vessel of human figure holding the hair of prone victim in one hand and a tumi knife to the throat in the other hand (Museo Rafael Larco, Lima. Adapted image courtesy of L. Engel, photographer)

continued down through the unpreserved costal cartilage. It is likely these cuts were created to access the chest cavity, possibly to remove the heart or lungs. The fractures of the first and second ribs are associated with the hyperextension of the costal vertebral joints as the anterior or sternal aspect of the thoracic cavity was elevated or laterally separated. However, no cuts were observed on the internal surfaces of the ribs or anterior thoracic vertebral bodies to suggest organs were cut out (Robicsek and Hales 1984; Tiesler and Cucina 2006).

Decapitation. Finally, horizontal cuts across the upper cervical vertebrae (C1 through C4), often bisecting the vertebral uncus, bodies, and articular surfaces, are consistent with completely severing the head from the neck just below the chin. The anterior location of the cuts suggests that cutting proceeded from the front to the back, and the proximity to the cervical-occipital junction indicates that the head was in a fully extended position. Frequently the contextual information about the rela-

Table 3. Distribution of Activity Signatures among TPS Individuals.

| Activity Signature | Total | | Adult | | Subadults | |
|---------------------|-------|-------|-------|-------|-----------|-------|
| | N | % | n | % | n | % |
| | 95 | 100% | 52 | 54.7% | 43 | 45.3% |
| No Cut Marks | 6 | 6.3% | 3 | 5.8% | 3 | 7.0% |
| Throat | 60 | 63.2% | 30 | 57.7% | 30 | 69.8% |
| Decapitation | 72 | 75.8% | 37 | 71.2% | 35 | 81.4% |
| Chest Opening | 67 | 70.5% | 38 | 73.1% | 29 | 67.4% |
| Throat only | 6 | 6.3% | 2 | 3.8% | 4 | 9.3% |
| Decapitation only | 6 | 6.3% | 4 | 7.7% | 2 | 4.7% |
| Chest only | 8 | 8.4% | 7 | 13.5% | 1 | 2.3% |
| Single Activity | | 21.1% | | 25.0% | | 16.3% |
| Throat/Decapitation | 7 | 7.4% | 2 | 3.8% | 5 | 11.6% |
| Throat/Chest | 16 | 16.8% | 6 | 11.5% | 10 | 23.3% |
| Decapitation/Chest | 15 | 15.8% | 8 | 15.4% | 7 | 16.3% |
| Two Activities | | 40.0% | | 30.8% | | 51.2% |
| Decap/Throat/Chest | 31 | 32.6% | 20 | 38.5% | 11 | 25.6% |

tionship of the cranium to the body (either completely separate or located at an angle inconsistent with normal articulation) also supports this interpretation of decapitation via sharp force trauma.

Although it is possible to cause death when cutting the throat without striking bone, it is nearly impossible to decapitate an individual without leaving a mark on the skeleton. At the same time, if the preferred method of accessing the chest cavity is to start at one side of the sternal notch, it seems unlikely that the chest cavity could be opened without leaving cut marks on the skeleton.

Table 3 summarizes the frequency of individuals with these cut mark signatures: 60 individuals (63.2 percent) had their throat cut; 72 individuals (75.8 percent) were decapitated; and 67 individuals (70.5 percent) had their chest opened. Most individuals, however, experienced more than one type of trauma and almost one-third demonstrated evidence of all three. This pattern of multiple activity signatures is similar both for adults and children in the sample.

Ritual Sequence

For those individuals with multiple injuries related to different activities, it is possible to propose a ritual sequence. Table 4 presents all the possible sequences for the three activities. It seems unlikely that the throat was cut after decapitation, so there are several options that can be disregarded (Options D, E, and F). Generally, if spilling or collecting

blood in a receptacle for further use in ritual was the most important goal then the cuts would have been made on the living, as seen in Moche iconography (Bourget and Newman 1998). With Option A or B, once the blood was collected the other dismembering activities could then follow. On the other hand, if there was a symbolic importance to removing the still-beating heart, as is suggested by ethnohistoric and ethnographic studies (Miller 1977; Nachtigall 1975), then perhaps the chest was opened first, followed by cutting the throat to acquire blood and finally decapitation (Option C). However, once the chest was cut open the victim would be dead and there would be no blood flow and thus little reason to cut the neck. At the same time, once dead through exsanguination, heart removal could still occur but without the possibility of a still-palpating organ, thus reducing the dramatic impact (Option A or B). Option A appears to be the most parsimonious explanation for the succession of events if blood flow was important and Option C if the beating heart was the goal. These options leave severing the head from the body as likely the final activity performed.

Ritual Violence at the Temple of the Sacred Stone

These data allow us to reconstruct ritual practices involving the regular ritual killing of men and children at the Temple of the Sacred Stone as a cohesive religious tradition. Although it is possible that

Table 4. Summary of Possible Ritual Sequences of the TPS Perimortem Trauma.

| Order | Option A | Option B | Option C | Option D | Option E | Option F |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1st Activity | Throat Cut | Throat Cut | Chest Opened | Decapitated | Decapitated | Chest Opened |
| 2nd Activity | Chest Opened | Decapitated | Throat Cut | Throat Cut | Chest Opened | Decapitated |
| 3rd Activity | Decapitated | Chest Opened | Decapitated | Chest Opened | Throat Cut | Throat Cut |
| Interpretation | Most likely | Possible? | Possible? | Unlikely | Unlikely | Unlikely |

the actions resulting in these ritual deaths were carried out somewhere else at the site and the bodies brought to the patio in front of the temple for interment, this seems unlikely given the centralized placement of the rock and associated altars, which suggests that the activities were part of this ritual landscape (Moore 2004; Swenson 2003).

The patterning of perimortem trauma is consistent with definitions of sacrificial offerings of human beings and their body parts, and the volume of remains demonstrates a fairly long and continuous history of practice. At the Temple of the Sacred Stone, there were three different ritual activity signatures marking the removal of a vital part of the body: blood, heart, and head. Andean ethnohistory and ethnography enable us to explore the symbolic importance of each ritual signature and its possible social significance.

Cutting the Throat—Bloodletting

Blood played an important role in Andean ritual. Classen (1993) describes blood as a preeminent symbol of passage and transition. In the Moche fineline illustration of the Presentation Theme (Figure 7), one of the individuals in the lower register is cutting the throat of a bound individual and holding a cup in the other hand. It is argued that the cup of collected blood is then presented to an anthropomorphized supernatural, Figure A, in the upper register. De Bock (2005) argues that blood is a metaphor for water, and that spilling of blood will induce the water to flow from the mountains, signaling the start of the rainy season.

Information from the chronicles also describes the importance of blood and its distribution in fourteenth and fifteenth century Inca rituals. Xérez (1872 [1534]) states that blood was used to anoint the faces of the idols and the doors of the temples, as well as the sepulchers of the dead. Murua (1987 [1590]) explains that the priests also transported blood from animal sacrifices in jars for offering to *huacas* as part of the ceremonial procession that

led the *capac hucha* child sacrifices to their deaths. Some *huacas* included the mummified bodies or stone representations of ancestral remains. These *huacas* were ritually fed blood by being anointed with it, in the hope that thus satisfied they would use their supernatural powers to support the state and to fulfill the wishes of the Inca (Classen 1993). Modern ethnographies describe the use and importance of blood in rituals as necessary offerings (Bolin 1998; Gose 1994). Over 60 percent of the victims at the Temple of the Sacred Stone had their throats slit. Since it is possible to cut an individual's throat and cause a fatal injury without striking the bone, this frequency may have been even higher. Whether the blood was collected is unknown, but seems likely since this act appears to have been the first part of a series of ritual activities. At Punta Lobos, there was also evidence of consistent cutting of the throats of a large number of boys and men dating to A.D. 1250–1350 (Verano and Toyne 2004), but the mortuary treatment there included blindfolds and bound hands, and there was no relationship to ceremonial architecture and no evidence of decapitation, all of which may suggest that slitting of the throat was simply the means of secular execution.

Chest Cavity Opening—Organ Removal

In general, surgical removal of the heart is difficult due to its protected location within the chest cavity, with the sternum in the front and ribs all around. It is held in place by large blood vessels and strong pericardial tissues (Robicsek and Hales 1984; Snell 2003). Researchers have proposed a number of different methods for accessing the heart, based on osteological evidence (Pijoan Aguade and Mansilla Lory 2004; Tiesler and Cucina 2006). In Mesoamerica, in addition to physical evidence, iconography demonstrates that heart removal was a common ritual activity using the subcostal and intercostal methods of removal (Robicsek and Hales 1984; Tiesler and Cucina 2006). Unlike the

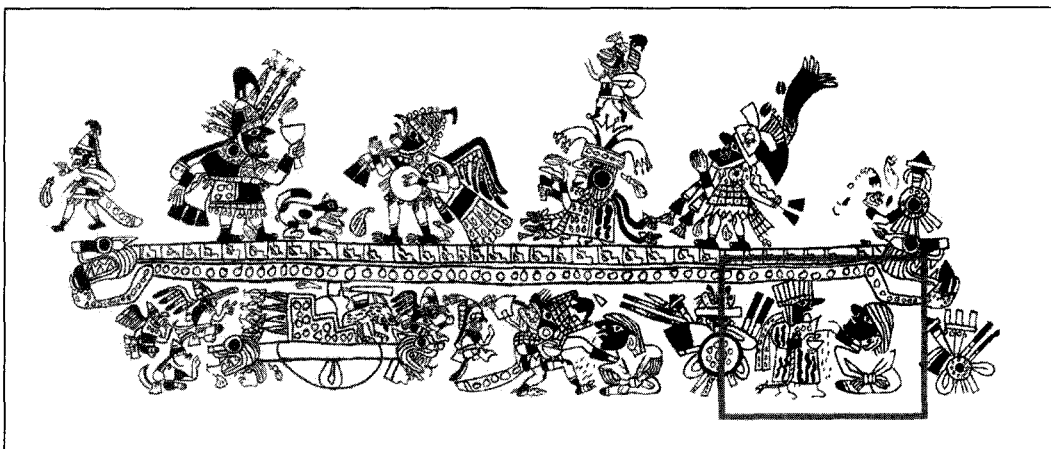


Figure 7. Illustration of Moche Period (A.D. 100–800) ceramic fineline drawing of the “Presentation Theme” with bound prisoner having his throat slit identified in the lower register (Donnan and McClelland 1999:Figure 4.102, with permission of authors).

Maya and Aztec cultures of Mesoamerica, there are no clear iconographic representations of heart sacrifice in the Andes.

The pattern of sternal cuts found at Túcume has been identified at other sites in coastal Peru and interpreted to represent possible heart removal (Klaus et al. 2010; Verano 1986). Verano (1986) identified cuts on the manubria of five individuals and multiple cervical fractures of the ribs, which supported the idea that the anterior chest had been opened completely. Since at the Temple of the Sacred Stone fractures are limited to the first ribs, the rib cage seems to have been spread apart just enough to allow access to the chest in order to observe, or remove, the heart or lungs. Although an aperture is created in the anterior chest wall along the mid-line of the body, there is no direct evidence that the goal was to remove the heart or any other specific organ in the chest. The hypothesis of heart removal comes from secondary sources.

Ethnohistoric documents describing Inca practices discuss heart removal as a form of human sacrifice (Murua 1987 [1590]) and as a method of punishment (Betanzos 1996 [1557]). Molina (1963 [1575]:55) described heart sacrifice at Huanacaure near Cusco:

Y a otros sacaban los corazones, vivos, y así con ellos palpitando, les ofrecían a las guacas a quien se hacía el sacrificio y con la sangre untaban casi de oreja a oreja el rostro de

la guaca, a lo cual llaman ‘pirac’, y a otros daban el cuerpo con la dicha sangre; y así enterraban los cuerpos juntamente con los demás sacrificios.

Of others [children] they removed the living hearts, and still beating, they offered them to the huacas to whom the sacrifice was dedicated and with the blood they anointed the face of the huaca almost from ear to ear, calling this ‘pirac’ and they covered the bodies of others with the aforementioned blood. They then buried the bodies together with the other sacrifices [translation by author].

Andean ethnographic research has also reported the removal of the still beating heart as a part of llama sacrifice (Gose 1994; Miller 1977). In the southern highlands at Chumbivilcas, the number of palpitations after extraction was used to predict the fortune of a recently married couple. The removal of llama lungs for divination may have been practiced similarly on humans (Betanzos 1996 [1557]). Ethnohistoric documents suggest the organ (heart or lung) was usually burned and the body was buried or burned at the end of the ritual (Molina 1963 [1575]). At the Temple, there were no specific hearth or burnt areas identified in or near the temple structure. The hearts may have been buried, disposed of elsewhere, or replaced within the chest (as the severed heads were repositioned).

Although the head is represented frequently in iconography, the symbolism and importance of the heart is less clear. Body fragmentation is evident in the relief artwork at Cerro Sechin (ca. 1500 B.C.) and in trophy heads of the south coast Nasca (A.D. 1–500). With these and other examples, Arnold and Hastorf (2008) argue that the symbolism of severed heads (at least) was linked to political formation where control of the head reflected control over the entire social and political body. In a similar fashion we can infer that heart and blood removal may have been symbolically linked in similar ways as vital essences that were required for both biological and social maintenance.

Decapitation—Head Removal

The decapitation theme was prevalent in the iconography of many different pre-Hispanic cultures beginning as early as 1500 B.C. (Benson 2001). The head appears to have had special importance in Andean ideology, based on repeated iconographic and archaeological finds. Verano (2001a:172) describes decapitation at the hands of a supernatural figure as the “quintessential signifier of ritual death in the Andean world”. During earlier Nasca and Moche times, severed heads were illustrated in iconography with supernatural-like figures holding a *tumi* blade in one hand and a severed head in the other, or as disembodied heads in association with the sacrifice theme (Verano et al. 1999). Examples of decapitation in Chimú iconography do not depict a deity, but a human, holding a knife in one hand, standing over a prone victim and holding the head up to expose the throat (Figure 6). There is a representational change in who is doing the decapitating (from an anthropomorphic creature to a human figure), which may suggest an ideological shift in who controls or determines the rituals. This artistic representation may demonstrate only cutting the throat, not decapitation, but either or both are possible outcomes.

The Inca believed that passage into the afterlife required a complete corpse, in addition to grave offerings (Betanzos 1996 [1557]). Decapitation was considered a punishment during Inca times for severe crimes, such as mutiny, or after battle to defile the enemy’s remains (Betanzos 1996 [1557]; Cieza de León 1963 [1538]; Ogburn 2007). When Atahualpa was captured by the Spanish and condemned to die, he chose to be baptized so that his

body would not be burned and not able to participate in the afterlife. However, the Spanish garroted him and not only physically cut off his head, but also symbolically decapitated the Inca state (Classen 1993).

At the Temple of the Sacred Stone, individuals were decapitated, but the goal was not the removal of the head for a trophy or for long-term display or other use. The only exceptions were the three crania (two clearly decapitated) buried within the temple. Their bodies may have been interred in the patio area, although it was not possible to match them to specific headless skeletons (individuals who were missing their crania through burial pit disturbance). Severing the head was part of the complex ritual mutilation, but once completed, the head was returned to its body for burial. This fact raises the question: Why remove the head at all? Why go to such effort to cut through the neck, only to put it back? Removal of the head may have been more important as a symbolic action; the goal was to destroy or transform the body in order for the ritual to achieve efficacy (Bloch 1992; Hill 2000). Yet, the final mortuary treatment of the offering or deceased appears to have required that the body be buried as a whole entity, perhaps to maintain its inclusive ritual value. Reincorporation of the individual within the burial and careful placement of the body seem to run counter to expectations for the destructive nature of punishment as described for later Inca times. Punishment, at least during Inca times, would have resulted in mortuary deposits more consistent with Duncan’s (2005) category of “violation” rather than the features consistent with “veneration” found here at the temple. It is not impossible that these remains were from executions involving highly complex and symbolically performed rites that placed the remains of the transgressors in close proximity to such a sacred site; this explanation, however, seems unlikely.

Three separate ritual actions were performed, frequently to the same individual, including cutting the throat, opening the chest cavity, and completely separating the head from the body. Most individuals have evidence of all three, suggesting these activities were performed together as part of the same ritual sequence. Individuals who did not demonstrate all three activities may have been a part of earlier or later, less elaborate, version of the same ritual, or perhaps reflect distinct religious events.

The comparable treatment of their remains suggests, at a minimum, a similar type of symbolic tradition related to the use and function of the temple.

The role of human sacrifice within ritual practice may be related to the quest for agricultural fertility, if these oblations were immolated on a regular basis, perhaps in relation to seasonal events, such as planting or harvesting. Swenson (2003) for example, suggests that in the Andes violent death represented 'life given' in order to get 'life back' in the form of agricultural production, human reproduction, and cosmological order. Similar arguments have been made for Moche sacrifice based on iconographic representations (Bourget 2001; de Bock 2005; Hocquenghem 2009). The cyclical and regular nature of agricultural processes provides specifically timed events for seeking supernatural affirmation through sacrifice and blood offerings. Rituals related to sacrificial death are difficult to reconstruct in all their intricacies and often are made more challenging by archaeological preservation or taphonomic processes. With the present data I outline the possible ritual death sequence performed at the Túcume's Temple of the Sacred Stone, but also acknowledge that variability in practice and meaning may have existed here as much as at other prehispanic Andean sites.

Conclusions

The skeletal remains from the Temple of the Sacred Stone at Túcume provide clear evidence of repeated ritual ceremonies that involve bloody sacrifice activities beginning during the Late Intermediate Period. Cut marks were identified on the bones of the upper chest and neck, and in almost all cases individuals demonstrated multiple incisions on several skeletal elements. There was no difference in the treatment of adult men or children in terms of frequency or location of peri-mortem trauma, which indicates consistency in ritual behaviors regardless of age. Interpretations of the distribution of cuts suggest that blood may have been collected and used for ritual purposes, such as anointing the stone. The benches inside the temple may have been used as altars upon which the internal chest cavity was opened and/or examined, or organs were removed as offerings. Finally, the heads of the victims were removed, but just as importantly rearticulated, perhaps because, conceptually, the bodies

had to be whole before placed in their prepared offering pit.

This research presents a distinctive set of mortuary features and scale of ritual violence previously unseen in the Andes, yet not completely unique when compared to other recent discoveries across the region. Human sacrifice was rare, but as these ritualized deaths demonstrate, it was carefully performed and repeated as an integrated part of social reproduction, often linked to elite power and status. Even if we broadly estimate one victim per year for 100 years, these deaths may have been linked to important calendrical events and thus integrated into social experience. The detailed skeletal analysis of perimortem treatment and manipulation of the large number of victims at Túcume's Temple of the Sacred Stone, possibly over an extended period of time, identifies elaborate ritual behaviors whose performance was required on a regular basis to maintain spiritual and perhaps social stability.

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Notes

1. Radiocarbon dating of human remains is less than ideal due to the marine reservoir effect of dietary components (marine resources) on the carbon content in the bone tissues.
2. *Spondylus calficifer*, a warm water shell that is only found off the coast of Ecuador, was part of long distance elite trade throughout the Andes and was commonly found in ritual contexts and high status burials (Cordy-Collins 2001; Narváez 1995a). These shells, worked or natural, are sacred offerings often associated with water symbolism and fertility. Additionally, there is some speculation as to their consumption during shamanistic rituals (Glowacki 2005).

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Application Deadline: March 1, 2012

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For additional information you may also contact one of the Project Co-Directors:

Dr. George Scheper (Humanities, Community College of Baltimore County (shepbklyn@aol.com)
Dr. Laraine Fletcher (Chair, Anthropology, Adelphi University) (fletcher@adelphi.edu)
Or contact Project Manager: Prof. David Berry, Executive Director, CCHA (berry@essex.edu).

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