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Excavation and Analysis of Human Skeletal Remains from a New Dedication Offering at Tiwanaku

John W. Verano

In 2005, excavations southeast of the Kalasasaya, directed by the archaeologist Arturo Rivera of Proyecto Arqueológico Pumapunku-Akapana (PAPA), discovered an offering of human and camelid remains accompanied by elaborate polychrome ceramics and other artifacts. Excavation of the offering and analysis of the skeletal remains were completed during the 2006 field season. This study first reviews previous discoveries of human offerings at Tiwanaku and their interpretation in order to contextualize this more recent find. The new offering will then be described, with a focus on the human skeletal remains, their context and demographic profile, and evidence of skeletal pathology. These data will then be compared with the known corpus of human offerings at Tiwanaku, highlighting similarities as well as some unique features of this particular offering. It will be argued that this new discovery represents a form of human offering not previously known from Tiwanaku.

Human Offerings at Tiwanaku

Human dedication offerings have been reported from various contexts at the site of Tiwanaku (Blom and Janusek 2004; Blom, Janusek, and Buikstra 2003; Couture 2003; Couture and Sampeck 2003; Manzanilla and Woodward 1990). In their 2004 article, Blom and Janusek propose that these offerings take two distinct forms. The first is typified by human and camelid offerings found at the Akapana. Here, fully and partially disarticulated skeletal remains have been found associated with the base and upper surface of the lowest terrace of the platform, in some cases associated with large concentrations of broken polychrome ceramics (Manzanilla and Woodward 1990). Original study of the human skeletal remains did not identify cut marks or other indications of intentional dismemberment, but a reexamination of the material by Deborah Blom found numerous cut marks and impact fractures, indicating that the human remains had been dismembered intentionally (Blom, Janusek, and Buikstra 2003). Blom also identified carnivore damage on some bones from the base of the terrace, as well as surface bleaching and cracking on an offering from the top of the terrace, suggesting that these remains had been left exposed to the elements for some period of time before being buried.

The second type of human offering Blom and Janusek identify at Tiwanaku is associated with ceremonial architecture in residential compounds east of the Akapana. In this case, human remains appear to have been collected, in some cases defleshed, and then carefully buried, often in bundles, in mounds sealing clean ritual spaces. The burial of these structures appears to mark a final sealing and abandonment of these ritual spaces; the human offerings are believed to represent ancestral remains incorporated into the ritual interment (Blom and Janusek 2004).

Blom and Janusek hypothesize that the Akapana and Akapana East offerings mark rituals associated with the dedication or abandonment of
architectural complexes at Tiwanaku. They emphasize, however, that the two activities were quite different in terms of their visibility (public monumental architecture vs. private ritual space) and the identity (possible sacrificial victims vs. ancestors) and treatment (careful burial vs. exposure) of the human remains found in these offerings. The new offering described in this chapter shares some features with both types, but in other respects it is distinctive.

A NEW OFFERING

Location and Context

The offering is located approximately 100 m east of the southeast corner of the Kalasasaya and about 50 m north of the northeast corner of the Akapana (fig. 13.1). The field designation for the excavation unit in which it is located is Zona Sur, Unidad N 2043, E 1023. The skeletal remains were found in a roughly oval-shaped pit with dimensions of approximately 170 by 200 cm, with the long axis of the oval oriented north–south. The deposit of skeletal remains is shallow, with a maximum depth of about 120 cm and minimum depth of about 90 cm below the present ground surface. In addition to the skeletal remains, an offering of thirteen polychrome ceramic bowls (escudillas), placed in three sets, and two metal objects associated with small burned areas were found on the east side of the bone concentration. Directly associated with one of the skeletons were kero fragments with polychrome decoration. The ceramics are of Tiwanaku IV–V style, indicating that the offering dates to c. AD 700 (A. Vranich, personal communication, October 16, 2006).

![Location of the offering, looking west, with the east gateway of the Kalasasaya in the background.](image-url)
Excavation Procedure

The bone concentration was pedestaled and covered with protective materials at the end of the 2005 field season. In July 2006 it was exposed for final cleaning and excavation. As an initial step, a sunshade was erected to protect the bones from ultraviolet light and excessive fluctuation in temperature. The excavation strategy involved first recording and removing those skeletons that were most superficial or were located at the margins of the pedestal and could be excavated without disturbing other remains. We then worked downward to the base of the deposit. All cleaning and removal of bones was done with bamboo picks and paintbrushes to avoid damaging bone surfaces. In the field laboratory, bones were further cleaned, photographed, analyzed, and boxed for storage.

Results

Excavation revealed that a minimum of sixteen individuals (and two camelids) were buried in the offering pit. Remains were assigned field numbers in the order in which they were exposed and removed. Figures 13.2–13.5 show sequential photographs of the deposit as it was excavated, with individual sets of remains numbered. Descriptions of each are given below.

INDIVIDUAL DESCRIPTIONS OF HUMAN REMAINS

Individual 1

I1 lay face down, with the legs tightly flexed at the knees. The left arm was slightly flexed at the elbow; the right arm was extended. Associated with the skeleton was a rock over the left elbow and a camelid scapula over the lower back and pelvis. Dental development gives an age estimate of approximately ten years. The frontal bone shows flattening, indicating cultural modification of the skull. The canine teeth show multiple enamel hypoplasias (fig. 13.6), which mark episodes of nutritional stress or illness during childhood (Goodman and Rose 1990), but no other dental or skeletal pathology was noted. Long bones were too fragmentary to measure.

Individual 2

I2 lay flexed on the right side, with the left arm flexed at the elbow and left hand lying under the...
Figure 13.3 After removal of skeletons overlying them, I10 and I15 are now visible.

Figure 13.4 The last four human skeletons to be removed (I12–I15). In this photo, several neck vertebrae of the second camelid skeleton (C2) are visible.
FIGURE 13.5 The second camelid skeleton (C2) lay at the base of the offering pit, separated from the remaining skeletons by 10–15 cm of soil.

FIGURE 13.6 Enamel hypoplasias on the lower right permanent canine of I1.
Dental development provides an age estimate of approximately seven years. The frontal bone shows flattening (cultural modification). Dental pathologies include multiple hypoplastic lines on the enamel of the upper incisors (fig. 13.7) and a supernumerary tooth emerging from the midline of the palate (fig. 13.8). No skeletal pathology was observed.

Individual 3

I3 lay prone with its head on its right side. The skeleton is incomplete, missing the pelvis, lower limbs, and left arm. Dental development indicates an age of approximately three years. The upper incisors show wear and chipping, indicating either mastication of particularly hard food or the use of the teeth as tools (fig. 13.9), although the latter seems unlikely in a child this young. No skeletal pathology was observed.

Individual 4

I4 consists of only a mandible and skull fragments of an infant, found in the pelvic area of I2. Based on dental calcification, age is estimated at about six months. No skeletal or dental pathology was observed.

Individual 5

I5 was assigned to an articulated pelvis, sacrum, legs, and some foot bones of a late adolescent/young adult male (eighteen–twenty years old). Living stature was estimated, using the Genovés formula (Genovés 1967), at approximately 159 cm, based on the maximum length of the left femur (405 mm). No skeletal pathology was observed, but the femora show particularly robust gluteal tuberosities—the insertion area on the proximal femora for gluteus maximus, the major extensor muscle of the thigh (fig. 13.10). Similar robusticity was found in an adolescent male skeleton from Machu Picchu and was interpreted as a possible indicator of habitual climbing of steep terrain (Verano 2003a).
Individual 6

I6 is the nearly complete skeleton (missing the right arm and top of the skull) of an adolescent female. The skeleton lay on its right side, with the legs and left arm flexed. Camelid leg and foot bones lay over the right femur, and a camelid calcaneus lay on the left innominate bone. A patch (32 by 16 mm) of unremodeled subperiosteal bone is present on the medial aspect of the distal end of the right tibia, just above the ankle (fig. 13.11). It may represent trauma (an ossified hematoma) or localized infection.

Individual 7

I7 is the isolated cranium and mandible of a child, approximately eight years of age. Although the skull was found with the mandible in proper articulation, no other skeletal elements of this individual were present. The skull shows no cranial modification. The most unusual feature of I7 is a series of holes in the vault and palate made by a pointed object with a circular cross section. The skull has five entry holes through the vault (fig. 13.12a, b) and one through the center of the palate. The defects on the vault have diameters ranging from 5.0 to 8.5 mm and vary from circular to oval/irregular in form. The holes show classic features of projectile entry wounds (Di Maio 1985), with circular to oval punched-out defects on the external table and irregular, internally beveled exit wounds on the internal table (fig. 13.13a, b). Most of the entry wounds are consistent with an object entering the skull perpendicular to the surface, but one shows a tangential entry, which left a “keyhole” defect (Berryman and Gunther 2000; Dixon 1982), with breakage and leveraging out of fragments on one end of the entrance wound (fig. 13.14). Two metal objects that were found in small burned areas associated with the offering are significant in this context. Both are copper or bronze tubular objects with a hollow open base and a pointed end (fig. 13.15). One is longer (45 mm) and one shorter (32 mm), but both are of similar diameter (9 mm maximum). The function of these objects is unknown, but they may be metal tips that were originally hafted to staffs or spears. Staffs with pointed tips were carried by Aymara malkus into the twentieth century. Examples of these staffs can be seen in a...
A metal point similar to the two found with the offering is known from an Inca-period context at Tiwanaku. It was analyzed by Heather Lechtman, who found it to be composed of tin bronze with some arsenic (Lechtman 2003). In contrast to the two found with the offering, however, the example studied by Lechtman had a metal cross.

Photograph taken in Bolivia by Max Uhle in 1893 (fig. 13.16).

Figure 13.12 External (a) and internal (b) views of the vault of I7, showing five penetrating wounds: two on the frontal bone, two on the right parietal bone, and one on the left parietal bone.

Figure 13.13 (a) Entrance wound on the external surface of the skull of I7, and (b) exit wound on the internal surface.

Figure 13.14 Tangential entry wound on the skull of I7, showing classic “keyhole” defect.
member near its open end. Otherwise it is similar in length and diameter to the two examples shown in figure 13.15. Comparing these possible staff tips or projectile points to the wounds on the skull of I7 reveals a good match (fig. 13.17), suggesting that points like these may have made the holes.

**Individual 8**

I8 is the partially articulated skeleton of a young adult male. The vertebral column and rib case are articulated, but other bones are jumbled, suggesting that this was a secondary burial. No mandible was found, and several upper incisors were lost postmortem, which is consistent with the reburial of partially decomposed remains. The frontal bone shows flattening, indicating cultural modification of the skull. Skeletal pathologies include a swollen right tibia (the left tibia was not found), which might have been caused by osteomyelitis or treponematosis (fig. 13.18), a healed fracture of the right clavicle, and compression fractures on four mid-lower thoracic vertebrae. In addition, a perimortem fracture was observed on the occipital bone. Externally, there is a 13 mm long linear depressed fracture located just lateral to the external occipital protuberance. The internal table shows a 14 mm diameter blown-out fracture corresponding to the location of the external vault fracture (fig. 13.19a, b).

**Individual 9**

I9 was assigned to an isolated adult mandible of indeterminate sex that was found beside the cranium of I13. It shows surface deterioration and
broken teeth, suggesting secondary, and possibly curated, remains.

Individual 10

I10 consists of the left ilium, ischium, femur, tibia, and fibula of an infant. No other bones appear to be associated with these partial remains. Based on the length of the femur (141 mm), age is estimated at approximately one year.

Individual 11

I11 is the complete skeleton of a child approximately four years of age. The skeleton lay face down, with the arms and legs flexed. The skull is
complete and shows no artificial modification. The most unusual finding is an oval defect, 17 by 7 mm, on the left parietal, located 23 mm above lambda and 18 mm lateral to the sagittal suture. A larger bone fragment, 33 by 28 mm, forms one margin of the defect and appears to be a portion of the skull that was broken away when some object penetrated the skull and was then pulled out, leveraging out the fragment. The margins of the broken area show the same soil staining as the rest of the skull, indicating that the breakage is ancient, as well as external beveling, indicating that the piece was fractured from outward force (fig. 13.20a, b).

Individual 12

I12 is the nearly complete skeleton of a young adult male, found lying face down, partially overlain by I5 and Cameld 1 (C1). Based on the length of the left femur, living stature was approximately 171.5 cm, relatively tall for modern highland Bolivians (Stinson 1990). The lower left second molar is abscessed out, but otherwise there is no dental or skeletal pathology except for fractures of the cranium and mandible that appear to be perimortem. Two oval-shaped linear wounds are present on the superior skull vault. The larger defect follows the sagittal suture; the shorter is located on the left parietal bone. Both defects show smooth external borders but jagged and punched-out margins on the internal table, consistent with penetrating wounds caused by blows from a narrow, linear object (fig. 13.21a, b). There is no evidence of any healing of the wound margins, and the jagged fractures of the inner table of the skull are consistent with perimortem wounds. The mandible also shows perimortem trauma in the form of linear

![Figure 13.20 Penetrating injury to the skull of I11, (a) with and (b) without a piece of bone that was leveraged out.](image)

![Figure 13.21 External (a) and internal (b) views of punched-out fractures of the skull vault of I12.](image)
fractures of the jaw and the fracturing off of the crowns of multiple teeth (fig. 13.22). Again, there is no evidence of healing, indicating that the fractures occurred around the time of death.

Individual 13

I13 is the mostly complete skeleton of a four- to five-year-old child. It lay on its side to the west of I12, overlain by the skeleton of C1. No skeletal or dental pathology was observed.

Individual 14

I14 is the skeleton of an adolescent about fifteen years old, of indeterminate sex. The skeleton lay on its right side, with the arms and legs flexed. No skeletal pathology was observed. Large enamel hypoplasias are present on the canines, particularly visible on the lower ones.

Individual 15

I15 was assigned to the skull and some ribs of an infant of approximately eighteen months, based on dental development. No pathology was observed.

Individual 16

I16 was a number assigned in the osteology laboratory to an isolated left ilium and ischium of an adolescent female. It could not be associated with any other sets of remains and thus was given its own number. No pathology was noted.

Two camelid skeletons, one largely complete and the other partial, were directly associated with the human remains (figs. 13.2, 13.4, 13.5). Fragments of camelid, bird, and fish bone—food remains that may be incidental inclusions in the pit fill—were also found in the soil surrounding the offering. All nonhuman bone was analyzed by Kristen Gardella (Verano, Vranich, and Gardella 2006) and will be reported elsewhere. For the purposes of this study, we note only that the two camelids were clearly part of the offering, similar to what has been reported for other human offerings at Tiwanaku. In this case, the more complete camelid (C2) was the first body to be placed into the offering pit, followed by the human remains and the second, partially disarticulated camelid (C1).

Demographic Composition of the Human Remains

Remains of both sexes and of ages ranging from infant to young adult are present in this offering (table 13.1). Infants and children are the most numerous; older adults are notably absent. Among individuals whose sex could be identified, three are males and two are females. Three individuals show cultural modification of the skull in the form of frontal flattening, while two appear to be unmodified. Unfortunately, other skulls from the offering were too fragmentary to assess. It was also not possible to identify with confidence whether the frontal flattening was produced by tabular (boards) or annular (cloth bands) deforming devices, due to the fragmentary nature of most skulls. Blom has found both forms of cranial modification in skulls from Tiwanaku, as well as skulls without cranial modification, and concludes from this that the ancient population at Tiwanaku was ethnically heterogeneous (Blom 2005). This offering deposit appears to reflect this heterogeneity on a very local scale.

Table 13.1 also indicates data on completeness: whether each set of remains was represented by a relatively complete skeleton or not. Nine skeletons were complete or relatively complete; seven individuals (nearly half of the total sample) were represented only by partial remains. The
complete skeletons show bones in proper articulation, indicating that these bodies were fleshed when placed in the ground. The incomplete remains appear to be secondary burials, removed from some other location after flesh had decomposed. No cut or chop marks were found on these bones that would indicate intentional dismemberment or defleshing of the remains, as has been found in the Akapana and some Akapana East offerings. Nor are any of the incomplete remains arranged as bundles of bones, as are some of the Akapana East secondary burials.

Overall, the combination of articulated and disarticulated remains in this offering indicates that it represents something more complex than a primary burial of recently deceased individuals. However, the commingled nature of the remains and the shallow depth of the deposit, with no evidence of sediment or fill layers separating the human bones, are consistent with a single burial episode. The only clear separation seen in the offering pit was a layer of soil 10–15 cm thick between the first camelid skeleton and the rest of the human and camelid remains. This could represent either some separation in time between the placement of the first and subsequent offerings or perhaps the intentional covering of the first camelid body with a layer of soil before the other remains were placed above it.

## Comparison with Other Human Offerings at Tiwanaku

Table 13.2 compares features of the two forms of human offerings identified by Blom and Janusek with the offering described in this chapter. A number of shared features can be identified, along with some that are particular to one or another type of offering. For example, carnivore damage has been found only on offerings associated with the base of the Akapana, and surface weathering only on bones found on the upper surface of Akapana terraces. Cut marks indicating dismemberment and defleshing of bodies are found in both the Akapana and Akapana East offerings, but not in the offering described here. Bundled secondary burials are known only from the Akapana East offerings.

The most distinctive feature of the offering described here is evidence of violent death. Three individuals show unhealed blunt trauma to the skull, and one has multiple penetrating wounds to the head. The fact that the skull with multiple penetrating wounds lacks an associated skeleton suggests that it may represent a decapitated victim. It is interesting to note that no skeletal remains have been found either at the Akapana or Akapana East with wounds that might indicate cause of death (Blom and Janusek 2004, 127). The cut and chop marks found on many of the Akapana and Akapana East skeletons appear to reflect dismemberment and defleshing of bodies, either as part of a sacrificial ritual, in the case of the Akapana offerings, or as mortuary behavior associated with the secondary burial of ancestors, at the Akapana East (Blom and Janusek 2004, 127).

## Discussion

How are we to interpret this new offering and its context? Unlike the human remains found at the base of the Akapana and in the Akapana East, this

### Table 13.1. Human remains, arranged in order of increasing age at death

<table>
<thead>
<tr>
<th>Field/Lab No.</th>
<th>Estimated Age</th>
<th>Sex</th>
<th>Completeness of Skeleton</th>
</tr>
</thead>
<tbody>
<tr>
<td>I 4</td>
<td>6 months</td>
<td>?</td>
<td>Partial</td>
</tr>
<tr>
<td>I 10</td>
<td>1 year</td>
<td>?</td>
<td>Partial</td>
</tr>
<tr>
<td>I 15</td>
<td>18 months</td>
<td>?</td>
<td>Partial</td>
</tr>
<tr>
<td>I 3</td>
<td>3 years</td>
<td>?</td>
<td>Complete</td>
</tr>
<tr>
<td>I 11</td>
<td>4 years</td>
<td>?</td>
<td>Complete</td>
</tr>
<tr>
<td>I 13</td>
<td>4 years</td>
<td>?</td>
<td>Complete</td>
</tr>
<tr>
<td>I 12</td>
<td>7 years</td>
<td>?</td>
<td>Complete</td>
</tr>
<tr>
<td>I 17</td>
<td>8 years</td>
<td>?</td>
<td>Complete</td>
</tr>
<tr>
<td>I 11</td>
<td>10 years</td>
<td>?</td>
<td>Complete</td>
</tr>
<tr>
<td>I 14</td>
<td>15 years</td>
<td>?</td>
<td>Complete</td>
</tr>
<tr>
<td>I 16</td>
<td>17–20 years</td>
<td>F</td>
<td>Partial</td>
</tr>
<tr>
<td>I 5</td>
<td>18–20 years</td>
<td>M</td>
<td>Partial</td>
</tr>
<tr>
<td>I 6</td>
<td>18–20 years</td>
<td>F</td>
<td>Complete</td>
</tr>
<tr>
<td>I 12</td>
<td>20–25 years</td>
<td>M</td>
<td>Complete</td>
</tr>
<tr>
<td>I 8</td>
<td>Young adult</td>
<td>M</td>
<td>Complete</td>
</tr>
<tr>
<td>I 9</td>
<td>Middle adult</td>
<td>?</td>
<td>Partial</td>
</tr>
</tbody>
</table>
offering is not directly associated with architecture. Although located near the Akapana and the Kalasasaya, the offering is not directly associated with either of them. In this respect it does not fit the model of dedication ceremonies associated with the construction or termination of ritual architecture, as has been proposed for other human offerings at Tiwanaku.

An alternative explanation for its location and possible ritual significance may be found in its relation to astronomical phenomena, as has recently been proposed by Vranich and Benítez. In recent studies of the alignment of architecture at Tiwanaku and nearby sites, Vranich and Benítez have observed that a beam of sunlight passes through the eastern gateway of the Kalasasaya at sunrise on the winter solstice (June 21), crosses through the Semisubterranean Temple and over the location of the offering pit, and continues directly to the eastern entrance of the Kantatalla complex (Vranich and Benítez 2010). While it may be difficult to prove that the placement of the offering on this axis was intentional, the apparent correlation is intriguing, as it constitutes one more potential element in a growing pattern of astronomical alignments at Tiwanaku (Vranich and Benítez 2010; Vranich 2006).

In summary, this newly discovered offering at Tiwanaku is enigmatic. It contains a heterogeneous mix of age and sex, articulation and disarticulation, and primary and secondary remains. Some individuals show perimortem trauma, but others do not. It appears to reflect a single depositional event, but the mix of primary and secondary remains indicates that individuals buried here died at different times and thus may have been brought from different places. These complexities make it difficult to propose a simple scenario to explain this mass interment. It also suggests that the full spectrum of complexity in human offerings at Tiwanaku has yet to be revealed.

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Table 13.2. Human offerings at Tiwanaku: comparative analysis

<table>
<thead>
<tr>
<th>Feature</th>
<th>Akapana</th>
<th>Akapana East</th>
<th>New Offering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directly associated with architecture</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Multiple individuals</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Single individuals</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Articulated skeletons</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Disarticulated remains</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Camelids</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Surface weathering</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carnivore damage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary bundled remains</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cut marks from dismemberment, defleshing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Violent death: blunt force injury</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Violent death: projectile injury</td>
<td></td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>
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