

## MODIFIED HUMAN SKULLS FROM THE URBAN SECTOR OF THE PYRAMIDS OF MOCHE, NORTHERN PERU

John W. Verano, Santiago Uceda, Claude Chapdelaine, Ricardo Tello, María Isabel Paredes, and Victor Pimentel

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*Recent excavations in the urban sector of the Pyramids at Moche in northern coastal Peru exposed two modified human skulls that were placed in an adobe niche within a domestic structure 100 m west of the Pyramid of the Moon ca. A.D. 400–650. A portion of the cranial vault is cut away from the top of each skull, and one shows drilled holes for attachment of the mandible. The skulls show a close resemblance to certain Moche ceramic skull jars that have a similar opening at the top of the vessel. Osteological analysis indicates that both skulls are of young adult males. Cut marks on the external surfaces of the cranial vault, face, and mandible indicate that they were prepared from fleshed heads and not from dry skulls. The finds at Moche are the first documented examples of this form of cranial modification, although an early Spanish account describes a similar trophy vessel that belonged to the Inca Atahualpa. Comparison of the Moche modified skulls with Nasca trophy heads reveals that the two were prepared and used differently.*

*En excavaciones recientes en el sector urbano del sitio de las Pirámides de Moche en la costa norte del Perú se descubrieron dos cráneos humanos modificados que habían sido colocados en un nicho de adobe, dentro de una estructura doméstica a 100 m al oeste de la Pirámide de la Luna ca. 400–650 d.C. En cada caso, una porción de la bóveda craneana fue removida, y una de ellas muestra perforaciones hechas para articular la mandíbula. Ambos presentan una gran semejanza con cerámica Moche en forma de cráneo, que tienen aberturas similares en su parte superior. El análisis osteológico indica que estos cráneos pertenecieron a varones adultos jóvenes. Ambos presentan marcas de corte en las superficies externas de la bóveda craneal, la cara y mandíbula realizadas durante el proceso de descarnamiento, lo cual indica que fueron preparados a partir de cabezas, y no a partir de cráneos ya secos. Estos hallazgos en Moche son los primeros ejemplos documentados de este tipo de modificación craneal, aunque un reporte español temprano menciona una vasija trofeo semejante que perteneció al Inca Atahualpa. La comparación de estos cráneos modificados Moche con las cabezas-trofeo Nasca revela diferencias significativas tanto en el método de preparación, como en su posible función.*

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**B**urials of isolated human skulls and mummified heads have been reported from a number of Andean archaeological sites (Verano 1995). Some of these—for example at Chavín de Huántar (Burger 1984:31), Huari (Brewster-Wray 1983), and Pikillacta (McEwan 1987:39)—appear to represent the secondary reburial of human remains as dedicatory offerings in architectural features. In other cases, however, mummified heads and isolated skulls show clear evidence of intentional decapitation and perimortem modification, suggesting that heads were taken from captives or sacrificial victims

as trophies or ritual objects. Ethnohistoric accounts and iconographic depictions suggest that the collection and modification of human heads was a temporally and geographically widespread practice in South America (Browne et al. 1993; Cordy-Collins 1992; Proulx 1971, 1989; Verano 1995). However, osteological evidence of decapitation and modification of human heads is relatively rare in the archaeological record, with the exception of the well-known mummified trophy heads of the Nasca culture of southern coastal Peru (Browne et al. 1993; Verano 1995).

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**John W. Verano** ■ Department of Anthropology, Tulane University, 1021 Audubon Street, New Orleans, LA 70118, USA  
**Santiago Uceda** ■ Facultad de Ciencias Sociales, Universidad Nacional de Trujillo, Ciudad Universitaria, Avenida Juan Pablo II s/n, Trujillo, Perú  
**Claude Chapdelaine** ■ Département d'anthropologie, Université de Montréal, C.P. 6128, succursale Centre-ville, Montréal, Québec H3C 3J7, Canada  
**Ricardo Tello, María Isabel Paredes, and Victor Pimentel** ■ Proyecto Arqueológico Huaca de la Luna, Universidad Nacional de Trujillo, Jr. Junín 682, Trujillo, Perú

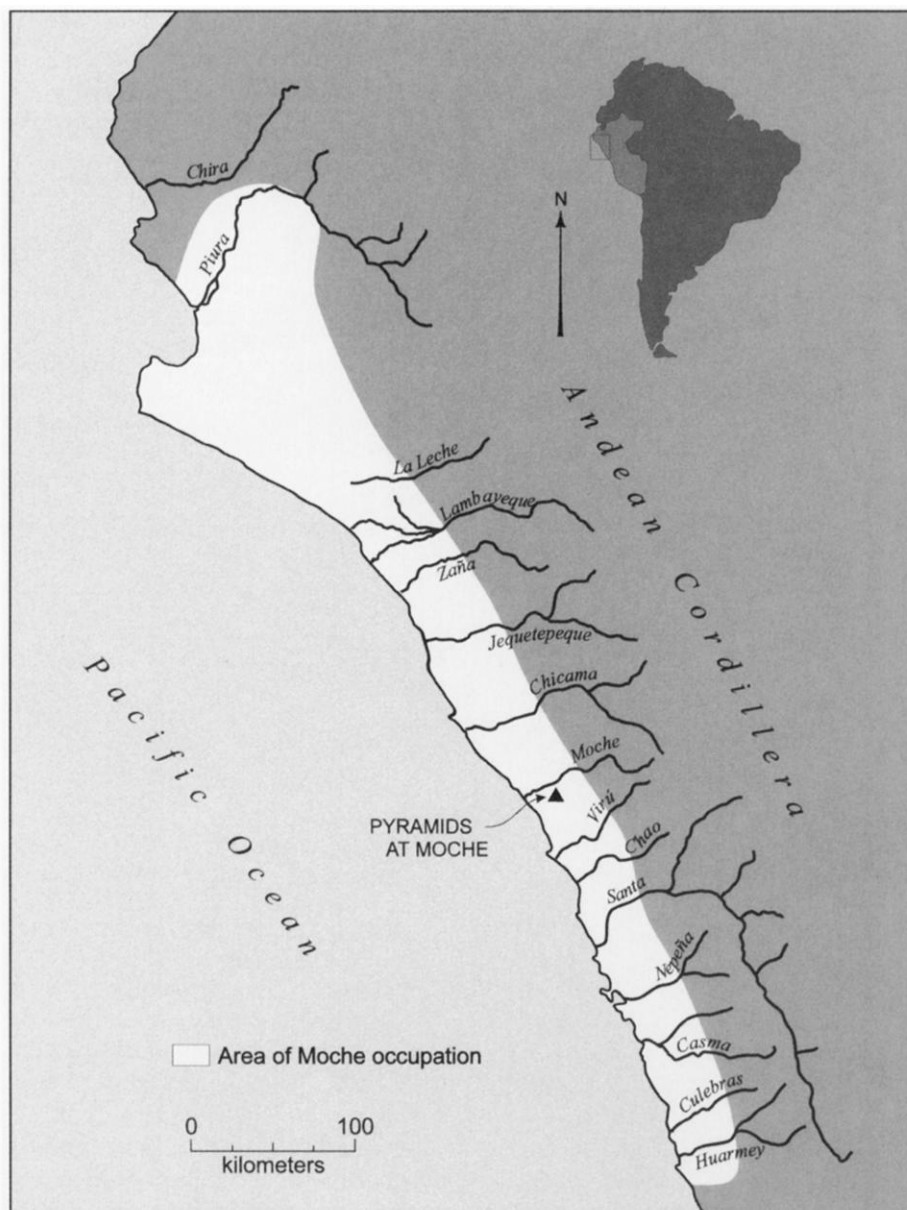


Figure 1. Map of the north coast of Peru (Courtesy of Donald McClelland, Fowler Museum of Cultural History).

In this report, we present the first evidence of a new and distinctive form of “trophy” skull from a major Moche ceremonial and residential complex on the north coast of Peru. We describe two skulls showing evidence of perimortem defleshing and modification into vessels. Although Moche ceramic vessels in the form of human skulls are known, these are the first examples created from actual human skulls. Cut marks on the external surfaces of the skulls indicate that they were prepared from fleshed heads, pre-

sumably from battlefield casualties or sacrificial victims. Scenes depicting the capture, sacrifice, and dismemberment of prisoners are well known in Moche iconography. This discovery provides additional evidence to support the argument that Moche depictions of prisoner capture and sacrifice reflect actual events, not simply mythological narrative (Alva and Donnan 1993; Bourget 1997a, 1997b; Donnan and Castillo 1994).

The two modified human skulls were found in

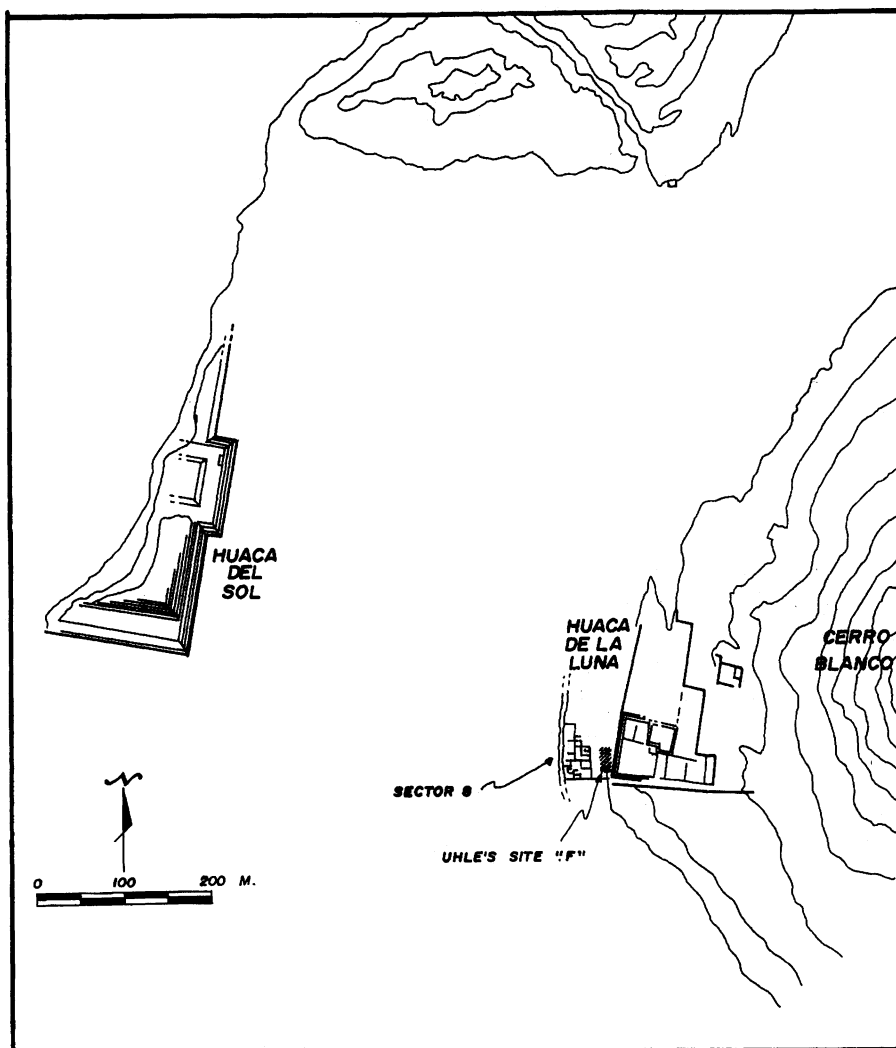


Figure 2. Location of ZUM Sector 8 (modified after Shimada 1994: Figure 2.1).

July 1996 during excavations in a room complex located approximately 100 m west of the Pyramid of the Moon at the site of the Pyramids at Moche in northern coastal Peru (Figure 1). Excavation of the complex, designated ZUM 8, was supervised by Ricardo Tello under the auspices of the Zona Urbana Moche (ZUM) Project. John Verano and Laurel Anderson of Tulane University exposed and removed the skulls, which were subsequently reconstructed and analyzed by Verano at the Archaeological Museum of the National University of Trujillo. Archaeologists María Isabel Paredes and Victor Pimentel analyzed the associated ceramics.

The Proyecto Zona Urbana Moche was established in 1995 as a long-term study of the urban sec-

tor of the Pyramids at Moche (Uceda et al. 1997). The project involves researchers and students from the University of Montreal and the University of Trujillo, and operates under the auspices of the Proyecto Huaca de La Luna, codirected by Santiago Uceda and Ricardo Morales of the Department of Social Sciences at the National University of Trujillo (Uceda and Morales 1993, 1994, 1996). Over the past three years, surface survey and excavation of the urban sector at Moche has revealed new information about the site—identifying residential complexes, artisan workshops, storage areas, streets, and plazas (Chapdelaine 1997)—that along with the monumental Pyramids of the Sun and Moon constitute the urban core of the site (Uceda et al. 1997).



Figure 3. Plan of ZUM 8. Arrow at bottom left indicates the niche where the skulls were found.

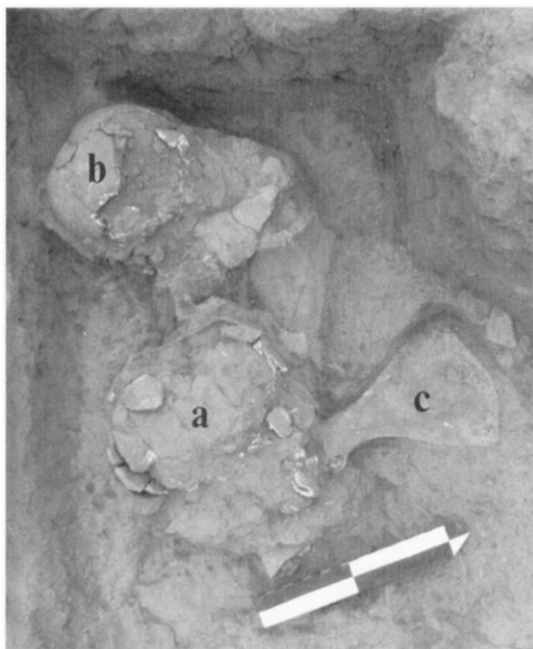
The skulls were found in Urban Sector 8 (Figure 2), on the west side of a platform excavated by Max Uhle in the late nineteenth century designated Site "F" (Kroeber 1925; Uhle 1915). Recent excavations reveal ZUM 8 to be an elite residential area with at least four distinct construction phases. The room complex in which the skulls were found, which corresponds to the second construction phase, is L-shaped, approximately 25 x 20 m in maximum dimensions, with its long arm oriented N-NE/S-SE (Figure 3). The complex is composed of a series of rooms and patios with raised benches constructed of adobe with clay-plastered walls and floors. A charcoal concentration found in association with a raised bench in the southern patio (Cuadro C2, Unidad 2, Capa C) built during the second construction phase yielded a date of  $1520 \pm 50$  B.P. (Beta-96033), with a 2 sigma calibration of A.D. 430–645. This date fits well within a series of radiocarbon dates from Moche IV contexts in the center of the urban sector (Chapdelaine 1997:75–79).

The southern limit of the complex is defined by a thick wall that extends eastward to the principal platform of the Pyramid of the Moon. It is delimited

to the west by a canal that cuts through various architectural units leading to a ceramic production area south of ZUM 8, and to the east by a patio with raised benches that forms a corner with Uhle's Site F.

The skulls were found in one of five niches built within the southern wall of a residential structure located in the center of ZUM 8. The niches are quadrangular in form, approximately 60 cm to a side, with access from above. Four of the niches were filled with clean sand. The niche with the skulls, in contrast, was filled with a compact sediment containing fragments of pottery, charcoal, the complete scapula of a camelid, and various fragments of animal bone (Figure 4). The nature of the niche fill (fragments of pottery and apparent domestic refuse) and the lack of any apparent care in placement or orientation of the skulls suggests a rather perfunctory burial. The niche lays under an intact floor corresponding to the third construction phase of ZUM 8.

A relative date for the niche deposit can be estimated from ceramics recovered from the floors of the complex and within the niche itself. Diagnostic ceramic sherds found on the floors of the second con-

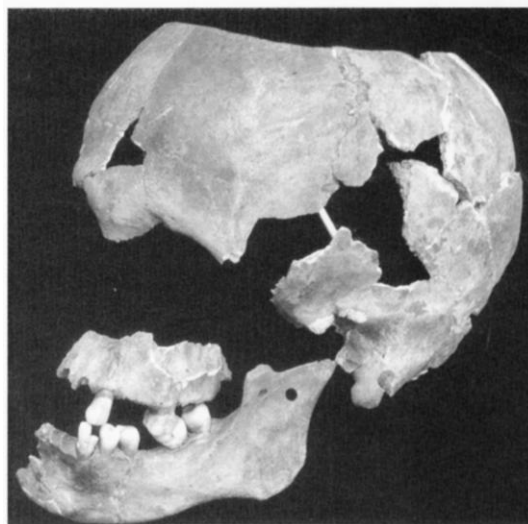
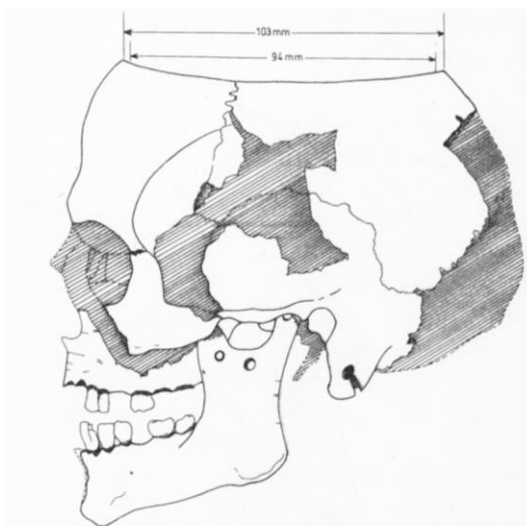


**Figure 4.** Photograph of the niche during excavation, showing Skull 1 (a), Skull 2 (b) and the camelid scapula (c). Skull 1 lies on its left side, with the mandible articulated. Skull 2, which lacks a mandible, lies face down.

struction phase of ZUM 8 correspond stylistically to Larco Hoyle's Moche Phase IV (Larco Hoyle 1938, 1939). A total of 27 ceramic fragments were recovered from the niche. Of these, 5 are portions of vessel rims, 3 are fragments showing decoration, and 19 are nondecorated body sherds. One of the decorated fragments is part of a moldmade figurine or musical instrument; the other two are small fragments of decorated bottles. The rim fragments represent jars of several forms that are similar to domestic vessels found in other habitational complexes between the two pyramids and resemble domestic vessels that Donnan has described from Moche sites in the Santa Valley (Donnan 1973:82–93). Soot on the external surface of one of the jars suggests use as a cooking vessel, and the interior surface of the neck of one of the vessels has three obliquely oriented incised lines, probably maker's marks (Donnan 1973:93–95).

#### Description of the Skulls

Technically speaking, the two "skulls" found in the niche are incomplete *crania*, one of which has an associated mandible. For simplicity of description, however, they will be referred to as Skull 1 and Skull 2.



**Figure 5 a, b.** Photograph and drawing of Skull 1. Cross-hatched areas in the drawing indicate missing bones.

#### Skull 1

Skull 1 consists of most of the left side of the vault (frontal, parietal, temporal, occipital bones) and face (left zygomatic and maxilla), and most of the mandible (Figure 5). The left maxilla has two teeth still present in their sockets: the canine and first molar. A lower central incisor was found in the socket of the left first premolar. All other alveoli are filled with dirt, indicating postmortem loss of the corresponding teeth.

The left half of the mandible is complete except for minor breakage of the coronoid process and condyle. About one-third of the right horizontal

ramus is preserved, with breakage posterior to the second molar. The following teeth are present in their proper alveoli: left canine (1/2 of crown missing; old breakage),  $P_{3-4}$ ,  $M_2$ ; right  $I_1$  (root only; old breakage),  $P_3$  (root only; old breakage),  $P_4$ ,  $M_1$ ,  $M_2$ . The left first molar was lost antemortem, and its socket is fully resorbed. An upper left third molar was found occupying the socket of the lower left third molar. Its roots had been modified (below) to allow it to fit into the socket.

The morphology of the sockets of the left upper and lower third molars indicate that they had erupted and were in occlusion at the time of death. The single upper third molar tooth, if it indeed belongs to this individual (below), shows blunting and polishing of the cusps, indicating that it was in occlusion for some period of time prior to death. Teeth still in proper position show wear consistent with a young adult (ca. 20 to 35 years), based on attrition rates seen in other Moche skeletal samples (Verano 1997a). Estimation of age on the basis of cranial suture closure is hard to evaluate due to the fragmentary nature of the skull, but visible portions of the coronal suture show no obliteration internally or externally. Morphology of the chin and size of the left mastoid process strongly suggest male sex.

Modifications to Skull 1 include the removal of a portion of the skull vault, the drilling of holes through the mandible and temporal bone, filing of tooth roots, and cut marks indicative of intentional defleshing. The top of the vault has a large oval defect, approximately 103 mm in maximum diameter at the level of the external table. The defect is beveled inward, such that its maximum diameter at the internal table is 94 mm. The lateral margins are not preserved sufficiently to measure maximum diameter in the coronal plane, but it appears that the opening was slightly more narrow side to side than front to back. The bone appears to have been cut by repeated grooving with a sharp instrument. Although the defect is similar to trephine openings seen in skulls from various central and southern Andean highland sites, as well as some Old World examples (e.g., Lisowski 1967), surgery on a living patient is unlikely in this case, as there is no evidence that trephination was practiced by the Moche or other Pre-columbian cultures of the north coast of Peru (Las-tes and Cabieses 1960; Verano 1998a).

The mandible has two holes drilled through the left ascending ramus below the mandibular notch and

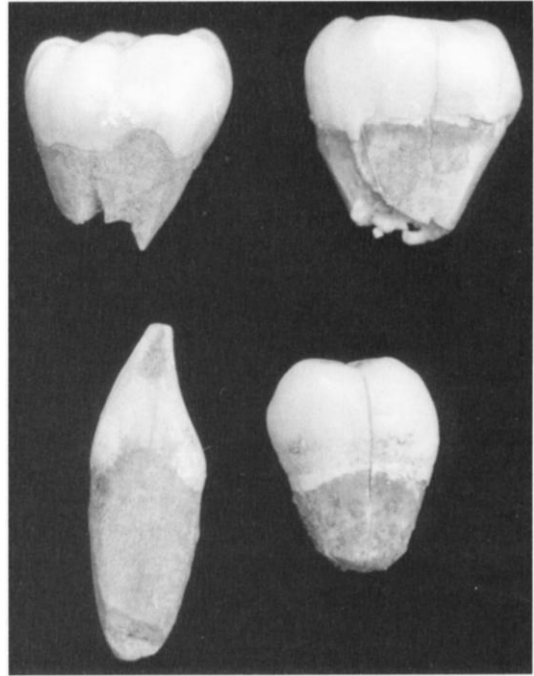


Figure 6. Teeth with modified roots, Skull 1.

one just below the condyle. All three holes are approximately 4 mm in maximum diameter and were drilled from the outside in, as they are conical in cross-section and larger in diameter on the external (lateral) surface of the ramus. Two holes also were drilled vertically through the zygomatic process of the left temporal bone. Presumably, cords were passed through these holes to attach the mandible to the cranium. The right temporal bone and ascending ramus of the mandible are not preserved, but presumably were perforated as well. A single hole also was drilled through the mastoid process of the left temporal bone (Figure 5). This hole does not seem to be related to the attachment of the mandible; it may have served to hold an ear ornament or other object.

Four teeth show filed or cut roots (Figure 6). Apparently the roots were modified so that they could enter an empty alveolus and replace a tooth that had been lost postmortem. Two of these (mentioned above) were found in sockets to which they clearly did not belong, while two other molars were found loose in the niche fill. All teeth are permanent and have occlusal wear compatible with the seven teeth still in their proper sockets. It is likely that the modified teeth are from this same individual, although they may have been obtained from skulls of other individuals of similar age.

Cut marks are present on the alveolar and nasal processes of the left maxilla and on the lateral aspect of the left zygomatic (Figure 5). The mandible has four cut marks on the posterior margin of the left ascending ramus and numerous small cut and scrape marks around the mental spines and digastric fossae on the posterior surface of the body. These marks appear to reflect intentional defleshing, and are important in indicating that a fleshed head rather than a dry skull was selected for modification. Presumably the vault was opened at this time as well to remove the brain.

### Skull 2

Skull 2 is more complete in some respects than Skull 1, although it lacks a mandible (Figure 7). Most of the vault bones (the frontal, parietals, squamous por-

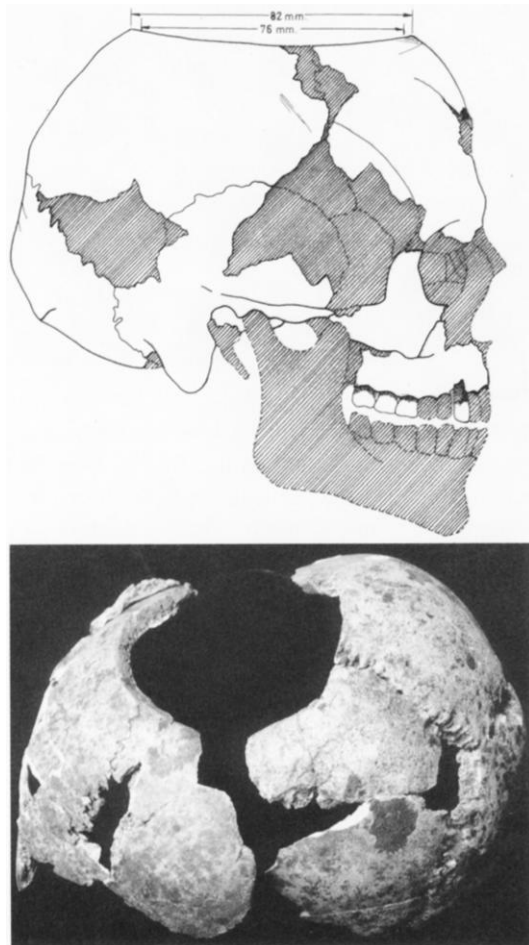


Figure 7a, b. Photograph (lower) and drawing (upper) of Skull 2. Cross-hatched areas in the drawing indicate missing bones.

tion of occipital, and right temporal) and portions of the base of the skull are preserved, including the basioccipital, distal portion of the basisphenoid, and the left occipital condyle. The right temporal was broken in a number of pieces, but could be reconstructed, and it was found to have no perforations through the zygomatic arch or through the mastoid process. The left temporal is less complete, but enough of the zygomatic process is present to indicate that no drilled holes are present. The face is fragmented but the maxillae and zygomatics are nearly complete, except for some of the thin bones of the nasal processes and the cheek area. The following teeth are present and in their sockets: the left canine,  $M^1$  and  $M^2$ ; and the right  $M^{1-3}$ . All other sockets are empty and show no alveolar resorption, indicating that the teeth were lost postmortem. The only tooth found loose was the right  $M^3$ . Its roots show no evidence of modification.

The spheno-occipital synchondrosis (basilar suture) is obliterated, suggesting an age of at least 20 years (McKern 1970). Cusp wear on the upper molars is similar to that of Skull 1, consistent with an age at death of approximately 20 to 30 years. Size of the right mastoid process and zygomatics and the prominence of Glabella suggest male sex.

Evidence of cultural modification of Skull 2 is limited to removal of a portion of the vault and cut marks on various bones. The vault opening is estimated to have been approximately 80 mm in maximum diameter. Like Skull 1, the opening is beveled inward and appears to have been made by repetitive grooving with a sharp instrument. Numerous scratches can be seen on the outer table around the margins of the opening (Figure 8).

Cut marks that suggest defleshing are present on the squamous portion of the occipital bone, on the right parietal across the temporal line, on the maxilla, and along the orbital margin of the left zygomatic. The preserved portion of the base of the skull shows no cut marks or fractures. The absence of damage to the base of the skull is an important distinction from Nasca trophy heads from the south coast of Peru (see below), which invariably show damage to the base of the skull that occurred during removal of the brain (Verano 1995, 1997b).

### Interpretation

Prior to this finding, intentionally modified skulls had not been reported from the north coast of Peru. Exam-



Figure 8. Anterior margin of vault defect, Skull 2, showing scratches.

ples of Moche ceramic jars in the form of skull bowls are known, however (Figure 9). The specific function of these jars is unknown, although they are clearly vessels that could hold solids or liquids. Unfortunately, the examples we have examined in museum collections do not have good archaeological context, but presumably they were excavated from tombs.

To make an actual skull hold liquid, one would need to seal numerous foramina and fissures or place some form of bowl (ceramic, metal, or gourd) within the cranial cavity. No traces of such a sealant or of bowls were found in Skull 1 or 2, although it should be noted that the skulls are fragmentary and very little of the cranial fossae are preserved. In addition, preservation of organic remains is generally poor at Moche, and gourds or organic sealants might not have preserved. Gourd plates and bowls are known to have been used extensively by the Moche, but they are poorly represented in the archaeological record (Donnan 1995: 143–146).

The use of human skulls as ceremonial drinking vessels is not unknown in the Andes. One that belonged to the Inka Atahualpa was described in a sixteenth-century account: “One of Atahualpa’s favourite possessions was the head of Atoc, one of Huascar’s generals...” Cristóbal de Mena saw this “head with its skin, dried flesh and hair. Its teeth were closed and held a silver spout. On top of the head a golden bowl was attached. Atahualpa used to drink from it when he was reminded of the wars waged against him by his brother” (Hemming 1970:54). The Moche skulls may have served a similar function, although apparently they were defleshed rather than mummified. The fact that the two skulls belonged to young adult males is significant as well, as a Moche sacrificial site containing the skeletal remains of dozens of adolescent and young adult males was discovered in 1995 in a courtyard behind the Pyramid of the Moon, approximately 150 m from ZUM 8 (Bourget 1997a, 1997b; Verano 1998b,



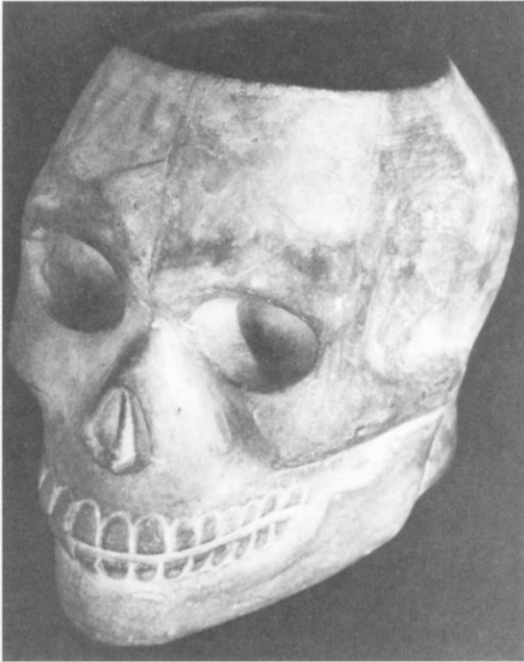


Figure 9. Moche ceramic vessel in the form of a skull (National Museum of Natural History, Smithsonian Institution, catalog number 148021. Height: 15 cm; diameter of opening: 9 cm).

1998c). Ceramics associated with the sacrificial victims and a radiocarbon date from a wooden post found in an associated adobe platform (1470 ± 80 B.P., Beta 96035; A.D. 425–690, 2 sigmas, calibrated) suggest that the modified skulls and the sacrificial site are roughly contemporary.

*Decapitation and Modification of Human Heads*

Decapitation, usually at the hands of supernaturals,

is a relatively common theme in Moche iconography (e.g., Donnan 1978, figs. 106, 151, 152, 205; Moser 1974), and appears to have deep roots in the artistic traditions of the north coast of Peru (Cordy-Collins 1992, 1998). Moche artists also depicted disembodied heads in scenes involving the sacrifice of prisoners (Figure 10). Sometimes the heads are shown as isolated elements, as in Figure 10, or placed atop poles (Benson 1972:Figure 5–16). Some have a rope passed through the mouth, apparently to allow them to be carried or tied to another object (Figure 11).

Moche iconography suggests that human heads were collected and manipulated in various ways. Until recently, however, there was no archaeological evidence to confirm this. Recent discoveries of decapitated individuals at the Pyramid of the Moon at Moche (Bourget 1997a, 1997b) and at the Moche site of Dos Cabezas in the Jequetepeque River valley (Cordy-Collins 1998) provide some of the first osteological evidence of such behavior. The two skulls from ZUM 8 described in this report add new information on the postmortem fate of particular heads.

Skulls 1 and 2 show differences in preparation technique that may be of significance. For example, Skull 2 does not have a mandible. Although it may have been present at one time but lost prior to burial, the lack of drilled holes in the zygomatic arches indicate that it would have been attached in a different manner than was the case in Skull 1. Skull 2 also lacks a perforated mastoid process. Although these differences could reflect nothing more than individual choices made by the person preparing the skull, preparation details such as the presence or absence



Figure 10. Roll-out drawing of a Moche IV vessel showing the arraignment and sacrifice of prisoners. An isolated head, presumably of a decapitated victim, can be seen in the lower right corner (Vessel from the collections of the American Museum of Natural History, New York; Drawing by Donna McClelland).

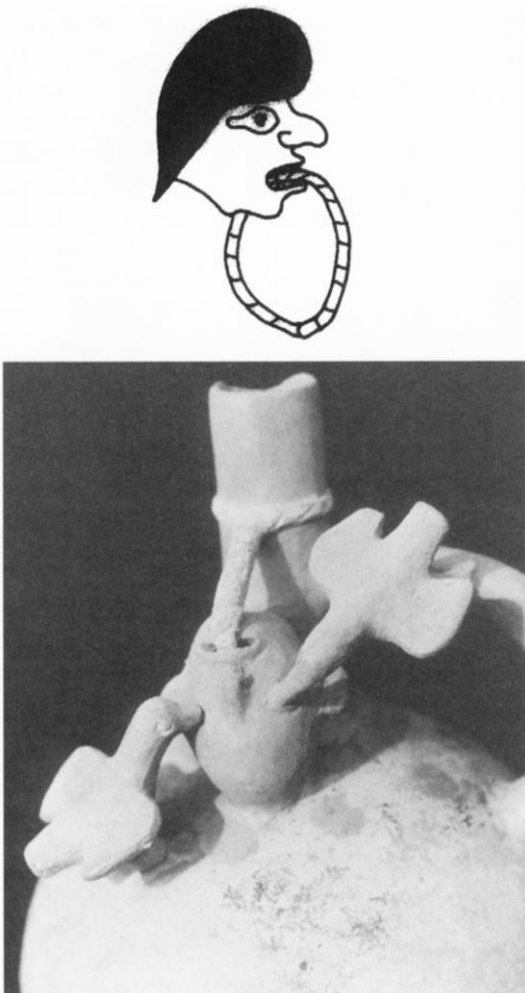


Figure 11. Moche depictions of heads with rope passed through the mouth: (a) from Donnan 1978: Figure 274; (b) detail of a spout and handle bottle in the collections of the Instituto Departamental de la Cultura, Trujillo (photograph courtesy of Christopher Donnan).

of ear ornaments may have marked the social rank of a victim or indicated different uses for particular skulls. The postmortem loss of many teeth and the modification and reinsertion of teeth into empty alveoli does suggest that there was substantial use of the skulls prior to their burial in the niche.

#### *Comparative Data*

Although “trophy heads” are common in the iconography of many ancient Andean societies, actual examples of severed human heads and modified human skulls are relatively rare (Verano 1995). A notable exception are mummified heads of the Nasca culture of the south coast of Peru (Proulx 1971,

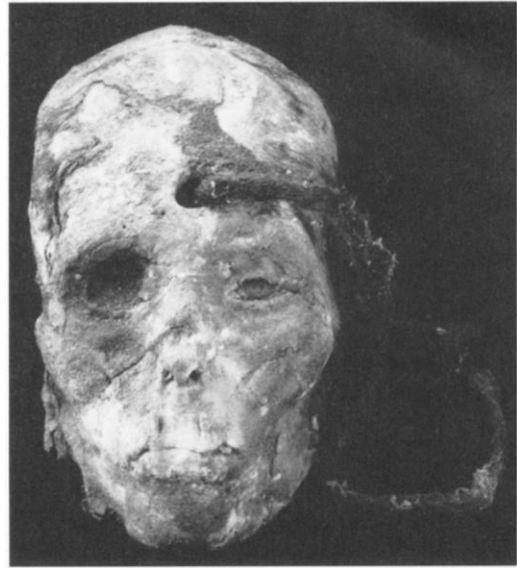


Figure 12. Nasca trophy head. In this example the carrying cord is composed of hair cut from the victim’s head (Courtesy of the Museo Nacional de Antropología, Arqueología, y Historia, Lima; catalog number AF: 7050).

1989), of which more than 100 examples are known (Baraybar 1987; Browne et al. 1993; Verano 1995). Nasca trophy heads were prepared in a manner quite distinct from that of the skulls at Moche, involving removal of the brain through the base of the skull and punching out a small perforation in the frontal bone to attach a carrying cord (Baraybar 1987; Verano 1995). Nasca trophy heads were mummified, and well-preserved examples still retain skin, hair, and carrying cords (Figure 12). The orbits and cheeks of many are stuffed with cloth, apparently to give the head a lifelike appearance. Nasca heads do not have an opening at the top of the skull, however; and could not have served as drinking vessels. They are thus quite distinct in preparation and presumed function from the modified skulls at Moche. Nevertheless, it is interesting to note some similarities between Nasca trophy heads and the Moche skulls in their curation and final deposition. Nasca trophy heads show evidence of having been carefully prepared and preserved. The complex treatment of the head, which included removal of the brain, muscles, and soft tissue structures at the base of the skull and the stuffing of cheeks and eye orbits implies that they were prepared for extended use and display. After some period of use these heads were carefully buried. The most frequently observed pattern is the burial of individual heads or caches of heads under floors or within

the fill of ceremonial architecture (Neira and Coelho 1972; Proulx 1989). Although two caches of Nasca trophy heads have been found in cemeteries, only rarely do such heads occur as grave offerings in Nasca tombs (Carmichael 1988:482–483). The modified skulls from Moche are similar in showing careful preparation as well as extended use, as is indicated by missing and replaced teeth. Moreover, they were recovered not from a mortuary context but from a niche in an elite residential compound. It would appear that the Moche skulls, like Nasca trophy heads, were not considered appropriate grave goods, but were buried as isolated offerings following an extended period of use.

### Significance of the Skulls from the Pyramids of Moche

The two skulls described in this report are significant for several reasons. They are the first examples of intentionally modified skulls to be reported from the north coast of Peru, and the first osteological parallel for ceramic skull vessels created by Moche artisans. The specific function of these vessels is unknown, as there are no depictions in Moche art that show them being held or used. Presumably they had some function related to the presentation and sacrifice of prisoners. Cut marks on the skulls indicate clearly that they were prepared from fleshed heads and not dry skulls. Their discovery at Moche, in close proximity to a sacrificial site at the Pyramid of the Moon, and the fact that both skulls appear to be of young adult males, suggest that they were taken from sacrificed captives. More research remains to be done before the nature and context of human sacrifice among the Moche is fully understood, but these modified skulls contribute to a growing body of evidence for sacrificial practices previously known only from Moche iconography.

*Acknowledgments.* The Proyecto Arqueológico Huaca de la Luna is grateful for financial support from the Unión de Cervecerías Peruanas Backus y Johnston, the Municipalidad Provincial de Trujillo, Gobierno Regional de La Libertad, and the Universidad Nacional de Trujillo. Funding for Chapdelaine's research was provided by a three year grant from the Social Sciences and Humanities Research Council of Canada. Verano's research was made possible by a Fulbright Lectureship at the Universidad Nacional de Trujillo granted by the Council for the International Exchange of Scholars. Figure 1 is courtesy of Donald McClelland of the Fowler Museum of Cultural History; Figures 2 and 3 were drafted by Carlos Ayesta, and Figures 5 and 7 by Gustavo

Pérez of the Proyecto Arqueológico Huaca de la Luna; Figure 10 is courtesy of Donna McClelland. Finally, we are grateful for the suggestions and comments of four external reviewers.

### References Cited

- Alva, W., and C.B. Donnan  
1993 *Royal Tombs of Sipán*. Fowler Museum of Cultural History, University of California-Los Angeles.
- Baraybar, J. P.  
1987 Cabezas trofeo Nasca: nuevas evidencias. *Gaceta Arqueológica Andina* 15:6–10.
- Benson, E. P.  
1972 *The Mochica, a Culture of Peru*. Praeger, New York.
- Bourget, S.  
1997a Las excavaciones en la Plaza 3a. In *Investigaciones en la Huaca de la Luna 1995*, edited by S. Uceda, E. Mujica, and R. Morales, pp. 51–59. Universidad Nacional de Trujillo, Peru.  
1997b La colère des ancêtres: découverte d'un site sacrificiel à la Huaca de la Luna, vallée de Moche. In *À l'ombre du Cerro Blanco, nouvelles découvertes sur la culture Moche, côte nord du Pérou*, edited by C. Chapdelaine, pp. 83–99. Les cahiers d'anthropologie N° 1. Département d'anthropologie, Université de Montréal.
- Brewster-Wray, C. C.  
1983 Spatial Patterning and the Function of a Huari Architectural Compound. In *Investigations of the Andean Past*, edited by D. Sandweiss, pp. 122–135. Latin American Studies Program, Cornell University, Ithaca.
- Browne, D. M., H. Silverman, and R. Garcia  
1993 A Cache of 48 Nasca Trophy Heads From Cerro Carapo, Peru. *Latin American Antiquity* 4: 274–294.
- Burger, R. L.  
1984 *The Prehistoric Occupation of Chavín de Huántar, Peru*. University of California Press, Berkeley.
- Carmichael, P. H.  
1988 *Nasca Mortuary Customs: Death and Ancient Society on the South Coast of Peru*. Ph.D. dissertation, University of Calgary. University Microfilms, Ann Arbor.
- Chapdelaine, C. (editor)  
1997 *À l'ombre du Cerro Blanco, nouvelles découvertes sur la culture Moche, côte nord du Pérou*. Les cahiers d'anthropologie N° 1. Département d'anthropologie, Université de Montréal, Québec.
- Cordy-Collins, A.  
1992 Archaism or Tradition? The Decapitation Theme in Cupisnique and Moche Iconography. *Latin American Antiquity* 3:206–220.  
1998 Off with Their Heads: Decapitation in Cupisnique and Early Moche. In *Ritual Sacrifice in Ancient Perú: New Discoveries and Interpretations*, edited by E. Benson and A. Cook. Manuscript on file, Department of Anthropology, Catholic University of America, Washington, D.C.
- Donnan, C. B.  
1973 *Moche Occupation of the Santa Valley, Peru*. University of California Publications in Anthropology 8. University of California Press, Berkeley.  
1978 *Moche Art of Peru: Pre-Columbian Symbolic Communication*. Museum of Cultural History, University of California, Los Angeles.  
1995 Moche Funerary Practice. In *Tombs for the Living: Andean Mortuary Practices*, edited by T. D. Dillehay, pp. 111–160. Dumbarton Oaks, Washington, D.C.
- Donnan, C. B., and L. J. Castillo  
1994 Excavaciones de tumbas de sacerdotisas Moche en San José de Moro, Jequetupeque. In *Moche, propuestas y per-*

- spectivas, *Actas del Primer Coloquio sobre la Cultura Moche*, edited by S. Uceda and E. Mujica, pp. 415–424. Universidad Nacional de Trujillo, Peru.
- Hemming, J.  
1970 *The Conquest of the Incas*. Harcourt Brace Jovanovich, New York.
- Kroeber, A. L.  
1928 The Uhle Pottery Collections From Moche. *University of California Publications in American Archaeology and Ethnology* 21(5):191–234.
- Larco Hoyle, R.  
1938 *Los mochicas. Tomo 1*. Casa Editora La Crónica y Variedades S.A., Lima.  
1939 *Los mochicas. Tomo 2*. Casa Editora La Crónica y Variedades S.A., Lima.
- Lastres, J. B., and F. Cabieses  
1960 *La trepanación del cráneo en el antiguo Perú*. Universidad Nacional Mayor de San Marcos, Lima.
- Lisowski, F. P.  
1967 Prehistoric and Early Historic Trepanation. In *Diseases in Antiquity*, edited by D. R. Brothwell and A. T. Sandison, pp. 651–672. Charles C. Thomas, Springfield, Illinois.
- McEwan, G.  
1987 *The Middle Horizon in the Valley of Cuzco, Peru: The Impact of the Wari Occupation of Pikillacta in the Lucre Basin*. BAR International Series 372. British Archaeological Reports, Oxford.
- McKern, T. W.  
1970 Estimation of Skeletal Age: From Puberty to About 30 Years of Age. In *Personal Identification in Mass Disasters*, edited by T. D. Stewart, pp. 41–56. Smithsonian Institution Press, Washington, D.C.
- Moser, C. L.  
1974 Ritual Decapitation in Moche Art. *Archaeology* 27(1):30–37.
- Neira, M., and V. P. Coelho  
1972 Enterramientos de Cabezas de la Cultura Nasca. *Revista do Museu Paulista*, N.s. 20: 109–142.
- Proulx, D. A.  
1971 Headhunting in Ancient Peru. *Archaeology* 24(1):16–21.  
1989 Nasca Trophy Heads: Victims of Warfare or Ritual Sacrifice?. In *Cultures in Conflict: Current Archaeological Perspectives*, edited by D. C. Tkaczuk and B. C. Vivian, pp. 73–85. University of Calgary Archaeological Association, Calgary.
- Shimada, I.  
1994 *Pampa Grande and the Mochica Culture*. University of Texas Press, Austin.
- Uceda, S., and R. Morales (editors)  
1993 *Informe segunda temporada, 1992, Proyecto de Investigación y Conservación Huaca de la Luna*. Universidad Nacional de Trujillo, Trujillo, Peru.  
1994 *Informe tercera temporada, 1993, Proyecto de Investigación y Conservación Huaca de la Luna*. Universidad Nacional de Trujillo, Trujillo, Peru.  
1996 *Informe técnico, 1995, Proyecto Arqueológico Huaca de la Luna*. Universidad Nacional de Trujillo, Trujillo, Peru.
- Uceda, S., E. Mujica, and R. Morales (editors)  
1997 *Investigaciones en la Huaca de la Luna 1995*. Universidad Nacional de Trujillo, Peru.
- Uhle, M.  
1915 Las ruinas de Moche. *Boletín de la Sociedad Geográfica de Lima* 30(3):57–71.
- Verano, J. W.  
1995 Where Do They Rest? The Treatment of Human Offerings and Trophies in Ancient Peru. In *Tombs for the Living: Andean Mortuary Practices*, edited by T. D. Dillehay, pp. 189–227. *Dumbarton Oaks*, Washington, D.C.  
1997a Physical Characteristics and Skeletal Biology of the Moche Population at Pacatnamu. In *The Pacatnamu Papers, Volume 2: The Moche Occupation*, edited by C. B. Donnan and G. A. Cock, pp. 189–214. Museum of Cultural History, University of California, Los Angeles.  
1997b Advances in the Paleopathology of Andean South America. *Journal of World Prehistory* 11: 237–268.  
1998a La trepanación como tratamiento terapéutico para fracturas craneales en el antiguo Perú. In *Estudios de antropología biológica (VIII Coloquio Internacional de Antropología Física "Juan Comas," 1995)*. Instituto de Investigaciones Antropológicas de UNAM, Instituto Nacional de Antropología e Historia, and Asociación Mexicana de Antropología Biológica, Mexico (in press).  
1998b Sacrificios humanos, desmembramientos y modificaciones culturales en restos osteológicos: evidencias de las temporadas de investigación 1995–96 en la Huaca de la Luna. In *Investigaciones en la Huaca de la Luna 1996*, edited by S. Uceda and E. Mujica. Universidad Nacional de Trujillo, Peru, pp. 159–171.  
1998c The Physical Evidence of Human Sacrifice in Ancient Peru. In *Ritual Sacrifice in Ancient Peru: New Discoveries and Interpretations*, edited by E. Benson and A. Cook. Manuscript on file, Department of Anthropology, Catholic University of America, Washington, D.C.

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Received April 2, 1998; accepted May 26, 1998; revised July 23, 1998.