

AUTEURS/ AUTHORS : Karina GERDAU-RADONIC¹ ; Alexander HERRERA²

¹Bournemouth University, School of Conservation Sciences, Centre for Forensic Science; Christchurch House, Talbot Campus, Fern Barrow, Poole, Dorset, BH12 5BB, Royaume Uni; kgradonic@bournemouth.ac.uk; corresponding author.

²Universidad de los Andes, Departamento de Antropología; Carrera 1 N° 18A-10, Bogotá D.C., Colombia; alherrer@uniandes.edu.co

TITLE: Why dig looted tombs? Two examples and some answers from Keushu (Ancash highlands, Peru)

TITRE : Pourquoi fouiller des dépôts funéraires pillés ? Deux exemples et quelques réponses de Keushu (Ancash, Pérou)

ABSTRACT

Looted tombs at Andean archaeological sites are largely the result of a long tradition of trade in archaeological artefacts, coupled to the 17th century policy of eradicating ancestor veneration and destroying mortuary evidence in a bid to “extirpate idolatry.” On the surface, looted funerary contexts often present abundant disarticulated and displaced human remains as well as an apparent absence of mortuary accoutrements. What kind of information can archaeologists and biological anthropologists hope to gather from such contexts? In order to gauge the methodological possibilities and interpretative limitations of targeting looted tombs we fully excavated two collective funerary contexts at the archaeological site of Keushu (district and province of Yungay, Ancash, Peru; c. 2000 B.C. - A.D. 1600), which includes several dozen tombs, many built under large boulders or rock shelters, all of which appear disturbed by looting. The first is located in the ceremonial sector and excavation yielded information on four individuals; the second, in the funerary and residential sector, held the remains of seventy individuals -adults and juveniles. Here we present and discuss the recovered data and suggest that careful, joint excavations by archaeologists and biological

anthropologists can retrieve evidence of past mortuary practices, aid the biological characterisation of mortuary populations and help distinguish between a broad range of looting practices and post-depositional processes.

RÉSUMÉ

Le pillage de sépultures des sites archéologiques andins est principalement le résultat d'une longue tradition dans le commerce d'antiquités associé à la politique du XVII^e s. « d'extirper les idolâtries » en luttant contre le culte des ancêtres et en détruisant les dépôts mortuaires. En surface, ces dépôts funéraires présentent souvent d'abondants restes désarticulés et déplacés, et une absence apparente de mobilier funéraire. Quelles informations peuvent espérer obtenir de ces contextes les chercheurs ? Dans le but de mesurer les possibilités méthodologiques et les limitations interprétatives des études centrées sur ce genre de contexte, nous avons fouillé 2 tombes plurielles dans le site de Keushu (district et province de Yungay, Ancash, Pérou; c. 2000 av. J.C. à 1600 ap. J.C.), riche de plusieurs dizaines de sépultures, souvent construites en abri sous-roche, et toutes apparemment perturbées par du pillage récent. Le premier dépôt funéraire, dans le secteur cérémoniel, a fourni des informations sur 4 individus. Le deuxième, dans le secteur résidentiel et mortuaire, renfermait 70 sujets (adultes et immatures). Ici, nous présentons et discutons les données recueillies et nous suggérons que des fouilles conjointes entre des archéologues et des anthropologues peuvent à la fois permettre de déceler les traces de pratiques funéraires, caractériser biologiquement les populations passées et aider à différencier les processus post-dépositionnels ainsi que les diverses pratiques de pillage.

KEYWORDS: Archaeology, Andes, mortuary practices, collective tombs, looting

MOTS CLÉS : Archéologie, Andes, pratiques funéraires, tombes collectives, pillage

VERSION ABREGÉE

Les sépultures pillées sont fréquentes dans les sites archéologiques andins: elles sont le produit des pratiques de pillage récent ou colonial, ce dernier visant à éradiquer des comportements païens. De nos jours, il devient de plus en plus difficile de découvrir des sépultures intactes, même à des endroits reculés. Toutefois, il est inhabituel que des chercheurs enregistrent et collectent des données à l'intérieur de ce genre de dépôt. C'est pourquoi, dans le but de déterminer le type d'informations disponibles et d'évaluer la fiabilité des données qui peuvent être recueillies par le biais d'une étude systématique, nous avons fouillé deux sépultures pillées du site de Keushu (Ancash, Pérou ; c. 2000 av. J.C.- 1600 ap. J.C.). Nous souhaitons réfléchir aux moyens d'établir les dommages infligés et d'identifier le type d'informations perdues, ainsi que déterminer ce que nous pouvons apprendre sur les pratiques mortuaires anciennes.

Nous avons fouillé deux sépultures en abri sous-roche, de type machay [5]. Une première étude du matériel osseux humain fut faite dans le but de compléter les informations de terrain et d'établir le « recrutement » (méthodes : Bruzek [13], Duday [20], Gally et Chaix [12], Moorees et al. [17, 18], Murail et al. [14], Scheuer et Black [15], Owings-Webb et Myers-Suchey [16], Ubelaker [19]).

En dépit du pillage, les deux dépôts funéraires contenaient du matériel non-perturbé dans les couches inférieures. Il semblerait que la taille (7,44 m²) de la tombe TD 1 et la quantité des vestiges qu'elle renfermait aient rendu difficile le pillage complet. Les pillers n'avaient touché qu'au matériel en surface, laissant intacte une épaisse couche de sédiment, laquelle renfermait plus de la moitié des vestiges osseux inventoriés et une partie du mobilier funéraire, parmi lequel 7 vases céramiques intacts. Ces vases fournissent des informations d'ordre chronologique et culturel. La tombe TC 39 étant plus facilement accessible, plus petite (1,5 m²) et contenant peu de dépouilles, la destruction avait été plus complète. Par ailleurs,

dans les deux structures, nous avons réussi à récupérer les restes des défunts qui y avaient été déposés. De ce fait, nous pensons que les pillages étaient récents. Les campagnes d'« extirpation d'idolâtries » du XVII^e s. visaient, inter alia, à éradiquer le culte aux ancêtres ; il était donc conseillé aux « visitadores » de l'époque de récupérer les dépouilles et de les détruire [1, 2].

Pour TC 39, outre le Nombre Minimum d'Individus (NMI 4), nous avons réussi à identifier chaque sujet et à reconstruire partiellement leurs squelettes. Dans TD 1, le NMI s'élevait à 70 individus (incomplets). Contrairement à TC 39, il ne nous fut pas possible d'identifier chaque sujet séparément. Néanmoins, nous avons pu établir la présence d'adultes et d'immatures, d'hommes et de femmes dans la chambre mortuaire. En outre, TD 1 renfermait des renseignements quant aux pratiques funéraires. La sépulture aurait accueilli des dépôts primaires et secondaires et au moins certains individus - adultes et immatures, peut-être masculins - avaient été momifiés.

Cette étude nous a permis de constater que, malgré le pillage, une fouille minutieuse facilite la récupération d'informations biologiques, chronologique et culturelles, à travers l'étude des os, du mobilier et des pratiques funéraires, données qui resteraient inaccessibles autrement. Les vestiges ostéologiques représentent un important potentiel de recherche car, outre le « recrutement », il est possible de faire nombre d'études sur ce matériel. Par ailleurs, la fouille permet aussi de différencier les pratiques de pillage. Ce n'est donc qu'une fouille systématique et complète ainsi qu'une collaboration étroite entre archéologues et anthropologues qui rendront accessibles les données qu'ils contiennent. Il faut s'attaquer à ces contextes perturbés comme le produit d'une longue histoire d'associations volontaires et involontaires.

The archaeology of Andean mortuary practices has long been impaired by recent and colonial looting, in particular the policies aimed at “extirpating idolatry.” Colonial efforts aimed at eradicating indigenous religion, including ancestor veneration and mortuary practices [1, 2, 3, 4]. Today, looting funded by the illicit antiquities market is the main cause for the ongoing destruction of ancient funerary contexts¹. It is therefore increasingly common for archaeologists to find all tombs on a given site, such as Keushu (3800 m.a.s.l., Ancash, Peru) severely disturbed. What is less common is for scholars to record and gather data from within looted mortuary structures. Our driving interest for doing so, was to assess the kinds and amount of information retrievable through systematic study and excavation of disturbed mortuary contexts. In this paper we aim to assess how reliable the data collected are, devise ways in which to gauge the kinds and amount of damage and see how much we may infer about past mortuary practices through the excavation of looted mortuary contexts.

KEUSHU

The site of Keushu surrounds a glacial lake located at 3800 m.a.s.l. on the upper western escarpment of the snow-capped Cordillera Blanca high above the town of Yungay (Ancash, Peru; Figure 1). It encompasses ceremonial, mortuary and habitation areas, as well as ancient hydraulic infrastructure, including the intakes of two canals that divert glacier runoff from the Huandoy glacier to extensive irrigation systems below. Survey and excavation data recorded over three years by members of Proyecto de Investigación Arqueológico Wanduy (PIAW 2006-2008) are the subject of ongoing analyses [5], but preliminary results indicate an occupation span beginning in the Initial Period, and continuing through to the early Colonial Period (c. 2000 BC - AD 1570). Most of the ceremonial, mortuary and domestic architecture

¹ From personal experience we also know looting can be prompted by ongoing archaeological excavations. Additionally, quarrying of archaeological sites for building materials, milling stones and spindle whorls are

visible on the surface of the site today was built during and after the second half of the first millennium AD.

METHODS and MATERIALS

The present study focused on excavation of two very different looted *machay* chambered tombs: a small tomb under a large rock slab prominently located opposite the access of a large trapezoidal ceremonial *kancha* enclosure [6] set within the ceremonial sector, and a large, single-chambered tomb located below one of many large boulders strewn across the slope which also houses the main residential sector of the site.

Machay tombs represent a recurrent Andean type of sheltered funerary structure, widely spread in time and space. Tombs are usually adapted to a natural cave, crevice or rock shelter or built under a large boulder [5]. At Keushu the absence of a roof is a shared trait, but only one of the two tombs under study makes use of natural rock for walls. Given the importance of mountains and rock outcrops in 16th century Andean mythology [7, 8] (on major oracles see Curatola and Ziolkowski [9]), this cannot be readily interpreted as a measure to reduce labour input. It seems more likely that people sought to keep the mortal remains of their ancestors in proximity to particular rocks or mountains imbued with symbolic meaning.

Only two weeks were available for the excavation of each funerary structure, and the priority was to learn as much as possible from each *machay* tomb. Excavation proceeded by layers identified as being the product of different events during the natural or cultural history of the structures, irrespective of their consolidation (i.e commingled bones with or without soil). The bone fragments recovered within each structure were identified according to the layer they came from. Time constraints further prevented establishing a detailed visual and three-dimensional record of the exact position of each bone fragment recovered. Nevertheless,

commonplace.

interesting associations of bone fragments were either photographed or sketched. Pictures had to be taken at an angle thus distorting the scale, because the rock cover of each structure made it virtually impossible to horizontally photograph the content with standard equipment (see Figures 4 to 8 below). Plan drawings were made at a scale of 1:20 cm. Stratigraphy was systematized using the Harris matrix [10].

***Machay* tomb TC 39**

Tomb TC 39 is located opposite the access to one of the largest enclosures on site (EC-V), a trapezoidal structure with baffled access and lateral rooms (Figure 2). The most distinctive feature of this ceremonial *kancha* is a large rock slab which protrudes diagonally from the ground opposite the access, near the centre of the far side of the courtyard (Figure 3). This tomb is closely associated with a small niched cubicle immediately to the west (R2), which is partly covered by the same rock slab. The location and the striking white band crossing the exterior surface of the rock strongly suggest that both the enclosure and the tomb were purposefully built around and under this slab (Figures 2, 3 and 4). Pottery fragments recovered from excavations within and in front of the niched cubicle suggest a mid Middle Horizon date for the construction of the enclosure (c. AD 700-900). They include the remains of an offering of three smashed *keru*² ceremonial vessels.

While the slanted slab provides a most sturdy roof for the funerary structure (Figure 4), the east wall was found missing. Probably it was destroyed by looters to ease access to the interior. Since human remains were found inside, it seems most likely that the structure was looted in modern times. During the *Extirpación* campaigns, it was policy to extract and destroy the osteological contents, or dispose of it in a secluded distant place in order to counter deep-seated practices of ancestor veneration [1, 2].

² A *keru* is a type of ceremonial drinking vessel without handles that tapers towards the base.

The interior of TC 39 has an area of 1.5 sq m. Excavations indicate that the structure was built into a previously dug out space, then walled in on all four sides. If an access was left open it would have faced east. The discordance between the interior and exterior façades of the rear, west wall -which separates tomb TC 39 from the forecourt of enclosure R2- and its great thickness suggest the presence of two abutting walls. This in turn suggests two distinct moments of construction, though this does not necessarily indicate distance in time. Analyses of pottery finds from TC 39 and R2 suggest the latter to be several centuries earlier than the former.³ The smashed vessel excavated in TC 39 stylistically dates to the Late Intermediate Period (AD 1200-1470), whereas the *keru* fragments found in R2, as mentioned above, date to the eighth and tenth century A.D.

The loose osteological material within this funerary structure had previously been inventoried and partially analysed [11], but the structure itself had not been excavated. We excavated the interior of tomb TC 39 as well as an area 100 cm x 50 cm in front of it (Figure 4).

Machay tomb TD 1

Tomb TD 1 is found at the upper edge of the south facing slope which houses the main residential sector of the site. Surface survey suggests that mortuary and ceremonial use of the area dates back to the Early Horizon (800-200 BC), as indicated by rock art and pottery finds associated with a large *wanka* rock shrine prominently situated at the top of the ridge. Extensive terracing covers most of the slope, with abundant evidence of residential activity, including several large *maray* milling stones, scores of dwellings, and several enclosed areas. Large natural boulders lie dispersed across the slope, concentrating in certain areas. Many of them -though by no means all- were used to build *machay* tombs below. Disturbed human

³ We have carbon samples which will provide radiocarbon dates for the construction of ECV and for the *keru*

remains are abundant in less accessible tombs.

The interior of TD 1 measures 7.44 sq m, only a fraction of the space available under the boulder. As with tomb TC 39, the mortuary chamber in TD1 was built into a previously excavated space, then walled in. Walls were built under the rock to the north and west, the boulder itself enclosing the structure to the south. The opening under the eastern edge of the boulder (Figure 5) was originally covered by medium-sized stone slabs 50 to 70 cm long. This wall was partially destroyed by the looters who pushed the wall into the tomb. Despite this disturbance we were able to identify this aperture as part of the original access to the structure. Though its exterior appearance remains unclear three stones found *in situ* at the centre of the wall describe steps leading down and inside the chamber.

Osteological analysis

An osteological analysis of the remains recovered within both structures was undertaken as a means to determine the number of individuals interred in each one and to determine their sex (adults) and their age-at-death (juveniles and young adults).

The Minimal Number of Individuals (MNI) was estimated from bone frequencies. Dental MNI is yet to be calculated. The procedure employed for the osteological MNI is the one detailed by Gallay and Chaix [12]. The MNI was calculated for each bone of the human skeleton, with the exception of the vertebrae -other than the Atlas and Axis,- the ribs -other than the first,- and the hand and foot phalanges. For paired bones, left- from right-sided fragments were identified. All fragments were identified when possible and counted, after which the number of individual bones represented amongst the fragments was calculated. This procedure takes into account which fragments could form one complete bone. All possible matches were considered, so that the estimate is minimal. The number of complete bones was

added to the number of individual bones represented by the fragments. Juveniles were counted separately from adults. The MNI is given by the bone (left or right, if applicable) yielding the highest count.

Two methods were employed to determine sex: a macroscopic method [13] and a metric analysis [14]. Results are given separately for each method. Only individuals whose innominate bone was completely formed (three parts fused) were sexed.

Age-at-death was estimated for juveniles and young adults by means of osteological markers [15, 16] and dental development [17, 18, 19]⁴. As the remains were commingled, mandibles were not necessarily associated to their respective crania. Age curves were therefore established separately for the mandibles and the maxillaries.

Finally, we followed Duday's recommendations for establishing first and second level osteological associations ("*liaisons de premier et deuxième ordre*"), which inform on depositional sequence -primary versus secondary, simultaneity of deposits-, reconstruction of individuals and displacement of bones [20].

RESULTS and INTERPRETATIONS

In both structures we identified units of stratification with *in situ* material, though these were initially less apparent in TC 39, as well as clearly disturbed finds. Both structures held human remains in varying degrees of preservation, as well as remnants of the funerary cache, mainly in the form of pottery shards.

Tomb TC 39

Excavation of this tomb yielded an intentionally smashed large ceramic vessel fragment

in a small pit dug into the sterile ground at the floor of the structure. Analyses of the commingled human remains indicate that this funerary structure held four individuals: one adult male,⁵ two adult females and one juvenile, approximately two years old according to its dental development [17,18]. No first level osteological associations of the remains were identified, but second level osteological associations enabled partial reconstruction of individuals. Additionally, we noticed certain pathologies -e.g., a right and a left adult fibulae with posterior-lateral bowing- artificial cranial deformations and an unusual case of multiple trephination- which we aim to investigate further.

The extended excavation area enabled us to recover additional materials, such as small bones, which had found their way outside this funerary structure. The bone count demonstrates that all adult body parts are equally well represented, suggesting that the adults were primary funerary deposits (Table I). The small size of TC 39 (150 cm (l) * 100 cm (w) * 100 cm (h at its highest point)) makes it probable that the individuals buried within were originally deposited in a sitting/squatting position; only the juvenile could have possibly fitted in an extended position.

Notwithstanding, the presence of bundles and mummified individuals in the large slope-side tomb TD 1 (see discussion below) suggests another possibility: that TC 39 held secondary, and not primary burials, or both. Bone frequencies may not differ between primary and secondary burials if appropriate steps are taken to ensure the preservation of the body's integrity by means of mummification or funerary bundles, as these conditions facilitate the transport of human remains from one place to another, such as during secondary funerary rituals [21]. Moreover, ritual pilgrimage, warfare and oracular consultation are salient features of indigenous Andean socio-political organization which involve the regular participation of

⁴ Ubelaker's dental development tables were used [19] if Moorees' method could not be applied [17,18].

⁵ According to the metric analysis [14], this individual had a probability of 0,9471 of being male and was therefore diagnosed as undetermined (the cutoff point was 0,95).

certain deceased individuals, by means of their mummies or funerary bundles.

It is noteworthy that the juvenile is only represented by bones of the cranium, the manubrium and the right ulna (Table I), as it is likely that this child constitutes a secondary deposit, part of its remains (*pars pro toto*) having been recovered from elsewhere and placed together with the adults inside TC 39.

Although we have been able to biologically determine who was buried inside this structure, we know nothing about their social personae and little about the burial practices themselves. Given the age and sex distribution of individuals one may think they represent a family. Yet, the mortuary chamber is located below the central feature of a ceremonial structure, so the burial of an important person with others designated or destined to accompany him -or her- in death are plausible hypotheses. Looting makes it impossible to establish the sequence of events: primary, secondary or both, all at one moment in time (multiple burial) or sequentially (collective burial) (*cf.* Leclerc and Tarrête [22]). Further analysis of discrete traits -nonmetric dental and skeletal variations- may, however, provide some answers as to the possible biological relationship between individuals [23]

Tomb TD 1

Excavations in TD 1 revealed that, when the entrance wall was pushed inside -possibly by looters- it fell onto the sediment that covered the original funerary deposit. Beneath the rubble of large slabs we discovered seven intact ceramic vessels, placed on either side of the access (Figure 6). Looters appear to have only disturbed materials readily accessible on the surface, probably because of the large size of TD 1 (7.44 sq m) and the quantity of human remains inside (Figure 7). They left untouched a thick stratum (30 to 50 cm) of compact soil and roots that held over half of the mortal remains we found within the structure, as well as

part of the mortuary accoutrements.

During excavation of the unlooted, lower layer we did not identify any apparent ordering of the remains: that is, the remains within the structure did not appear to have been intentionally ordered either by individual skeletons or by osteological category (e.g., all femurs to one side). Rather, individual remains appear to have commingled through time, possibly through the regular addition of new remains and multiple manipulations (including the looters'). However, we did record four partial and heavily disarticulated skeletons (Figure 8) amongst the remains. From the lay-out of the contents it appears the deceased were placed towards the back or middle of the tomb, whereas funerary accoutrements, such as the seven intact vessels mentioned earlier, whether intended for one or several individuals, were placed nearer the entrance.

From the evidence collected to this point, it appears there was no intentional rearrangement of the material within the structure, that is to say, no apparent ordering of the remains was sought out through manipulation of the osteological material. Some remains were manipulated generating partial and heavily disarticulated skeletons as well as a vast layer of commingled remains.

The left femur count suggests that this burial chamber held at least 70 individuals: 53 adults and 17 juveniles under 16 years of age [15]. Nevertheless, the humerus MNI is of 21 juveniles: 19 left and 2 right humeri. These 2 right humeri are added to the 19 left ones as their developmental stage was not represented among the left-side bones.

The state of preservation of the bones rendered only a part of the innominate bones adequate for sexing. Analyses determined the presence of both men and women within the structure (Table II). At least three individuals were mummified: 2 adults (remains of 2 desiccated right hands) and 1 juvenile (cranium with desiccated scalp; 4 years old [19]). The

flexed left lower member of one mummified individual suggests some -or all- were placed in a flexed position. Finds of cordage and textiles are consistent with the idea that bodies were wrapped in a shroud or reed matting (or both), with the bundle tied in place with rope [24].

First level osteological associations were still apparent, noticeably a desiccated right hand (Figure 9), but second level osteological associations were harder to identify due to the large number of individuals. As opposed to TC 39, the MNI calculated by means of the smaller bones in TD 1 is lower than the one determined from larger bones. The left talus' adult MNI is 38 compared to the left femur's 53. The juvenile MNI for the left talus is 5, whereas the left femur's juvenile count is 17. It is therefore possible that this structure held secondary burials (see Table III).

It appears, however, that not all individuals whose remains were found in TD 1 were mummified, only a select few. It is worthy of note that both children and adults could be subject to mummification. Moreover, according to the metric method of sex diagnosis [14], the os coxae with desiccated soft tissue whose sex could be determined were all identified as male (Table IV).⁶ Additionally, the remains belonging to the mummified individuals were found scattered exclusively within the topmost layer of remains. On the one hand it appears the looters had quartered the mummies and scattered their remains when undoing the bundles to recover textiles and other funerary goods. On the other hand, by their presence in the upper, disturbed layer, but noticeable absence in the lower, intact layer it seems likely the mummified individuals were either the last to be placed inside the tomb, were kept in a readily accessible place within the structure, or both. This position of the mummified remains is consistent with practices of ancestor worship that require ready access to the ancestor's remains, as well as occasional removal of mortuary bundles from their usual resting place.

⁶ It is important to note, though, that one of the os coxae (right) whose sex was declared undetermined, would have been diagnosed as female had the cut-off point for the probability value been lowered to 0.9.

Pathologies worthy of further analyses include several adult fibulae and tibiae with bowing, which were present among the remains of TD 1, the same condition (but only on the fibulae) identified in TC 39, as mentioned above. Bowing of the inferior half of the lower limb is not uncommon among young children, yet it is a condition that usually disappears before adulthood [25]. In a recent study, deformities of the lower limb in adult skeletons from an archaeological sample were linked to Vitamin D deficiency during growth [25]. We therefore aim to conduct further research on this malformation and other pathologies in order to shed more light on the health and living conditions of the Keushu population. Additionally, seven crania with multiple craniotomies, most of which are well healed, are currently under study in order to refine our understanding of the surgical skills and medical knowledge of the ancient Keushu population.

The observed presence of deformed crania and discrete traits also requires further investigation, since cranial deformations may inform on the social status of individuals, cultural affinities between populations or the historical development and spread of cultural practices. Recent studies show that deformation types and techniques vary widely through time and space [26, 27, 28, *inter alia*].⁷ Research, therefore, will aim to metrically characterise cranial deformation practices at Keushu in order to compare these to other highland and coastal populations and address long term cultural trends across time and space [29]. Dental and osteological discrete traits can inform upon the biological relationship between individuals of a given population, as well as between populations [23, 30, 31]. A final future research objective on an expanded sample is to conduct studies on nonmetric traits as a means to contribute to the biological characterisation of the Keushu population and evaluate whether biological affinities between individuals within, and between mortuary

Unfortunately, for this particular bone, only three out five characters required by the Bruzek visual method [13] were observable, and its sex was also diagnosed as undetermined with this method (2 = m, 1 = f).

⁷ We thank Martin Friess (Musée de l'Homme, Paris) for his comments on this subject.

groups may be established.

CONCLUSIONS and RECOMMENDATIONS

Excavation of looted open burial funerary structures in the Andes can provide useful data on past populations and mortuary practices, as well as help characterise looting practices. In the two *machay* tombs under scrutiny, we were able to record the association of undisturbed materials below layers of commingled bone or wall collapse. The osteological material enabled us to estimate the MNI and to gather biological details about the individuals within. Material culture excavated within the structures provides information on the diversity of trappings and funerary goods, with implications for chronological placement and the reconstruction of mortuary practices. Both contexts contained a wealth of biological information about two distinct mortuary groups that is undergoing investigation. Further excavations of looted contexts may yet shed a more direct light on the material consequences of the *Extirpación* policy for mortuary archaeology in the Andes.

The contexts investigated seem to have been looted in modern times: they still held mortal remains and two cigarette butts were found in TD 1. As mentioned above, *visitadores*, clergymen responsible for eradicating idolatries, were summoned to destroy and fully dispose of mummies [1, 2]. One may therefore expect funerary structures victim of the *Extirpación* campaign to be devoid of much of their original contents. This may actually render it difficult to recognise mortuary function without excavation.

Although ease of access negatively affected preservation of burials in tomb TC 39 we were able to determine the presence of two women, one man and one infant (2 years old). We know little about how they were interred, but the associated, intact pottery cache suggests this burial occurred during the Late Intermediate Period (AD 1200-1470), centuries after the

ceremonial enclosure was built.

Tomb TD 1, far removed on the high slope above the ceremonial area of the site, in contrast, while affected by one or more looting events, is hard to study mainly due to its collective nature. It was found to contain many individuals, adult and juvenile, male and female, about half of which appear to have been incomplete. The bone count suggests secondary burials, though we cannot rule out the presence of primary deposits as well. Both adults and juveniles were mummified, and those whose sex could be determined were found to be male. The pattern that may be gleaned from the archaeological evidence suggests that mortuary bundles, tightly tied with cordage were placed towards the back of the tomb with vessels and other offerings nearer the entrance. Moreover, the mummified individuals appear to be among the last arrivals in the tomb, or to have been left in a readily accessible place within the structure.

As only two weeks were available for excavation of looted *machay* tomb TD1 our choice of strategy emphasised full recovery of all materials within the structure, rather than detailed three-dimensional recording of the position of each archaeological fragment, feature and stone. We opted against detailed partial recovery, as this would have limited the possibilities for spatial observations on the disposition of individuals and evidence of mortuary practices as a whole within the structure. Clearly, our compromise limits the amount of information recoverable on the internal functioning of the structure, and lays open the interpretive possibilities for more protracted and precise excavations specifically focussed on the displacement of remains within the tomb through time.

Excavating looted mortuary deposits as if they had not been disturbed, i.e. fully and systematically, can help establish a broad empirical base for subsequent analyses and interpretations. Despite the handling of remains, full recovery of all available materials, along with information on their position within the context, can provide data on the people buried

within each structure and, according to the level of destruction, on how they were initially buried. Depending on the space available within chambered tombs looters may tend to drag bones and materials outside. Excavating beyond the limits of the burial structure may therefore yield useful information, as in cave excavations. The type of site, the location of the structure and its relationship to the displaced remains will dictate whether it is possible to associate the materials inside with those outside the funerary chamber. Second level osteological associations may be particularly helpful at this point, as they enable the reconstruction of individuals whose bones are found dispersed.

Finally, this study hopes to spur closer collaborations between biological anthropologists and archaeologists in the field. Joint efforts are particularly well placed to furnish information on past funerary practices, past populations and traditions of looting, both historic and contemporary. Though our conclusions remain tentative, we suggest that archaeological excavation and bioanthropological analysis of looted contexts is particularly fruitful if looted tombs are studied as the *in situ* result of a long history of intentional and unintentional associations.

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REFERENCES/ BIBLIOGRAPHIE

- 1 Arriaga P J de (1920 [1621]) La extirpación de la idolatría en el Perú, Centro de Estudios Regionales Andinos “Bartolomé de las Casas”, Cuzco, 200 p
- 2 Duviols P (1971) La lutte contre les religions autochtones dans le Pérou colonial: "l'extirpation de l'idolâtrie", entre 1532 et 1660, Institut français d'études andines, Lima, diffusion Éditions Ophrys, Paris, 428 p
- 3 Ramos G, Urbano H (eds) (1993) Catolicismo y extirpación de idolatrías Siglos XVI –XVII Charcas, Chile, México, Perú, Centro de Estudios Regionales Andinos “Bartolomé de las Casas”, Cuzco, 482 p
- 4 Urbano H (1999) Estudio Preliminar. In: Arriaga PJ de, La extirpación de la idolatría en el Perú, Centro de Estudios Regionales Andinos “Bartolomé de las Casas”, Cuzco: pp. I-CXXXI
- 5 Herrera A, Lane K (eds) (in press) Investigaciones arqueológicas en la cuenca del nevado Huandoy, Ancash, Perú, Estudios Antropológicos 5, Universidad de los Andes, Bogotá
- 6 Herrera A (2007) Las *kancha* circulares: Espacios de interacción social en la sierra norte del Perú, Boletín de Arqueología de la Pontificia Universidad Católica del Perú 9: 233-255
- 7 Duviols P (1979) Un symbolisme de l'occupation, de l'aménagement et de l'exploitation de l'espace : Le monolithe ‘huanca’ et sa fonction dans les Andes préhispaniques. L'Homme XIX (2): 7-31
- 8 Gose P (1993) Segmentary State Formation and the Ritual Control of Water under the Incas. Comparative Studies in Society and History 35 (3): 480-514
- 9 Curatola M, Ziolkowski M (2008) Adivinación y oráculos en el mundo andino antiguo, Pontificia Universidad Católica del Perú, Lima, 310 p
- 10 Harris EC (1989) Principles of Archaeological Stratigraphy, Academic Press, London,

170 p

- 11 Herrera A (2008) Informe final de labores del Proyecto de Investigación Arqueológico Wanduy, temporada 2007, Informe presentado al Centro de Estudios Socioculturales e Internacionales, Universidad de los Andes, Bogotá, 161 p
- 12 Gallay A, Chaix L (1984) Le site pré-historique du Petit Chasseur Sion, Valais, 5 et 6. Le dolmen MXI, Lausanne, Département d'anthropologie de l'Université de Genève, Bibliothèque historique vaudoise, Cahiers d'archéologie romande, 31 and 32
- 13 Bruzek J (2002) A method for Visual Determination of Sex Using the Human Hip Bone. *American Journal of Physical Anthropology* 171: 157-168
- 14 Murail P, Bruzek J, Houet F, et al. (2005) DSP: a tool for probabilistic sex diagnosis using worldwide variability in hip-bone measurements. *Bulletins et mémoires de la Société d'Anthropologie de Paris*, ns, 17 (3-4): 167-176
- 15 Scheuer L, Black S (2000) *Developmental juvenile osteology*, Academic Press, San Diego, California, 587 p
- 16 Owings-Webb PA, Myers-Suchey J (1985) Epiphyseal union of the anterior iliac crest and medial clavicle in a modern multiracial sample of American males and females. *American Journal of Physical Anthropology* 68: 457-466
- 17 Moorees CFA, Fanning EA, Hunt Jr. EE (1963a) Age Variation of Formation Stages for Ten Permanent Teeth. *Journal of Dental Research* 42 (6): 1490-1502
- 18 Moorees CFA, Fanning EA, Hunt Jr. EE (1963b) Formation and Resorption of Three Deciduous Teeth in Children. *American Journal of Physical Anthropology* 21: 205-213
- 19 Ubelaker DH (1989) *Human Skeletal Remains: Excavation, Analysis, Interpretation* (2nd ed), Smithsonian Institution, Washington, DC, 172 p
- 20 Duday H (2005) L'archéothanatologie. In: Dutour O, Hublin J-J, Vandermeersch B (eds), *Objets et méthodes en paléanthropologie*, Comité des travaux historiques et

scientifiques, Paris, pp. 153-215

- 21 Gerdau-<http://www.myspace.com/librecalibreK> (2007) Les tombes collectives de Tablada de Lurín Vallée de Lurín, Pérou ; Ier - IIIe s ap JC, PhD Thesis, Université Bordeaux I, 2 vols
- 22 Leclerc J, Tarrete J (2004) Sépulture. In : Leroi-Gourhan A (ed) Dictionnaire de la préhistoire (2nd ed), Presses Universitaires de France, Paris: 1002-1003
- 23 Saunders SR, Rainey DL (2008) Nonmetric Trait Variation in the Skeleton: Abnormalities, Anomalies and Atavisms. In: Katzenberg MA, Saunders SR (eds) Biological Anthropology of the Human Skeleton (2nd ed), Wiley-Liss, Hoboken, New Jersey: pp. 533-560
- 24 Herrmann B, Meyer RD (1993), Südamerikanische Mumien aus vorspanischer Zeit: Eine radiologische Untersuchung, Staatliche Museen Preußischer Kulturbesitz, Berlin, 135 p
- 25 Brickley M, Mays S, Ives R (2010) Evaluation and interpretation of residual rickets deformities in adults. *International Journal of Osteoarchaeology* 20 (1): 54 - 66 (published online by Wiley Interscience (www.interscience.wiley.com) 12 nov 2008 DOI: 10.1002/oa.1007)
- 26 Blom DE (2005) Embodying borders: human body modification and diversity in Tiwanaku society. *Journal of Anthropological Archaeology* 24: 1-24
- 27 Perez SI (2007) Artificial cranial deformation in South America: a geometric morphometrics approximation. *Journal of Archaeological Science* 34 (10): 1649-1658
- 28 Torres-Rouff C, Yablonsky LT (2005) Cranial vault modification as a cultural artifact: a comparison of the Eurasian steppes and the Andes. *Homo: Journal of Comparative Human Biology* 56:1 1-16
- 29 Pomeroy E, Stock JT, Zakrzewski S, et al. (in press) A Metric Study of Three Types of

Artificial Cranial Modification from North-Central Peru. *International Journal of Osteoarchaeology* (published online by Wiley Interscience

(www.interscience.wiley.com):2 Apr 2009 DOI: 10.1002/oa.1044)

30 Berry AC, Berry RJ (1967) Epigenetic variation in the human cranium. *Journal of Anatomy* 101 (2): 361-379

31 Turner II CG, Nichol CR, Scott GR (1991) Scoring Procedures for Key Morphological Traits of the Permanent Dentition: The Arizona State University Dental Anthropology System. In: Kelley MA, Larsen CS (eds) *Advances in Dental Anthropology*, Wiley-Liss, Inc, New York: 13-31

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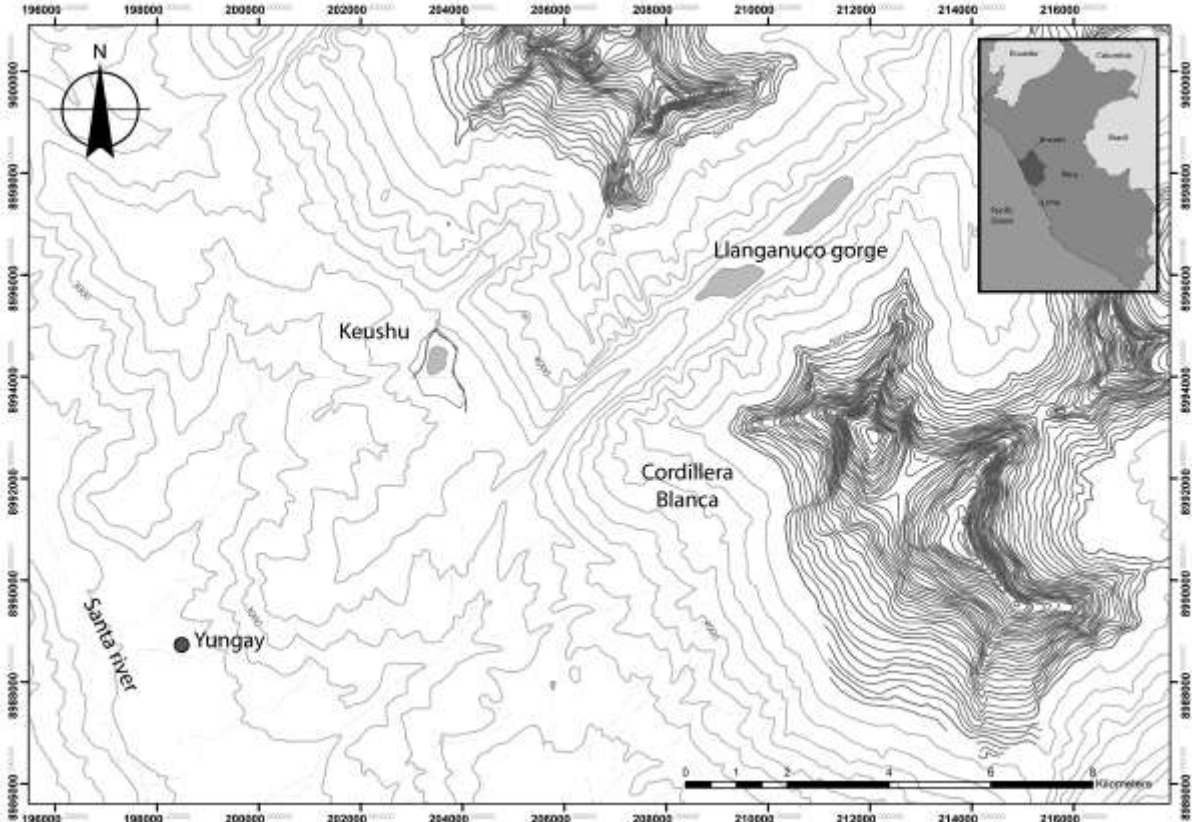


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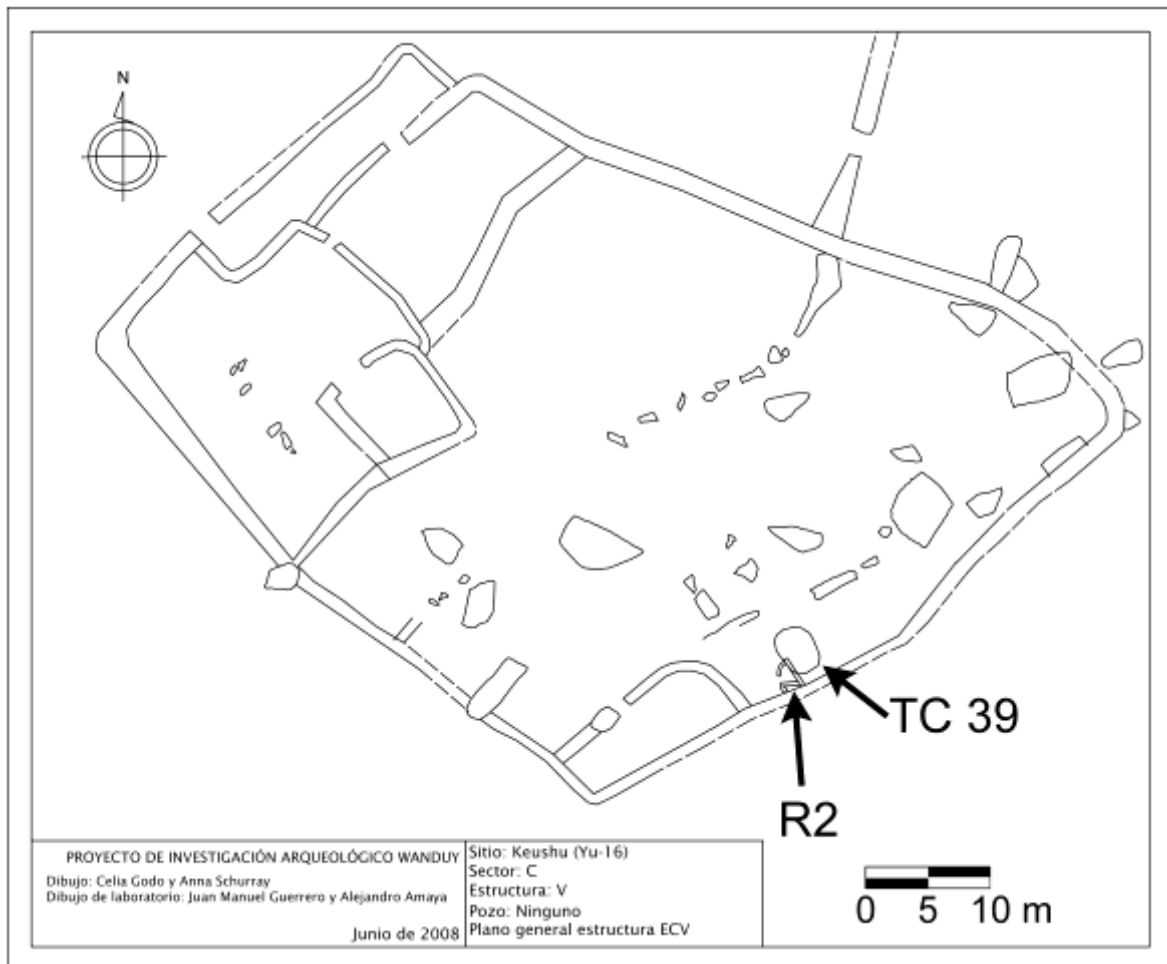


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Figure 9. TD 1, sector D: dessicated right hand. Dorsal view.
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	MNI			MNI			MNI	
	Adults	Juveniles		Adults	Juveniles		Adults	Juveniles
Cranium	3	1	Patella	2	0	Calcaneus	3	0
Mandible	0	0	Tibia	3	0	Talus	3	0
Hyoid	0	0	Fibula	3	0	Cuboid	2	0
Atlas	2	0	Scaphoid	1	0	Navicular	3	0
Axis	1	0	Lunate	1	0	Cuneiform 1	0	0
Thoracic 1	0	0	Triquetral	0	0	Cuneiform 2	1	0
Clavicle	1	0	Pisiform	0	0	Cuneiform 3	2	0
Rib 1	2	0	Hamate	0	0	MTT 1	2	0
Sternum	1	1	Capitate	1	0	MTT 2	3	0
Scapula	3	0	Trapezium	2	0	MTT 3	2	0
Humerus	3	0	Trapezoid	1	0	MTT 4	3	0
Ulna	3	1	MTC 1	0	0	MTT 5	2	0
Radius	3	0	MTC 2	0	0			
Os coxae	3	0	MTC 3	0	0			
Sacrum	0	0	MTC 4	0	0			
Coccyx	0	0	MTC 5	0	0			
Femur	3	0						

Table I. TC 39, sector C: bone frequencies.
Tableau I. TC 39, secteur C : fréquences de pièces osseuses.

Murail	M	F	UNDET
Right	6	5	21
Left	3	7	12
Bruzek			
Right	2	8	21
Left	3	5	14

Table II. TD 1, sector D: results of the sex diagnosis.
Tableau II. TD 1, secteur D : résultats de la diagnose sexuelle.

	MNI			MNI			MNI	
	Adults	Juveniles		Adults	Juveniles		Adults	Juveniles
Frontal	32	14	Os coxae	36	14	Calcaneus	29	5
Parietal	45	5	Sacrum	37	7	Talus	38	5
Temporal	49	13	Coccyx	14	0	Cuboid	23	1
Occipital	43	12	Femur	53	17	Navicular	26	1
Zygomatic	26	8	Patella	43	1	Cuneiform 1	21	0
Maxillary	28	13	Tibia	51	17	Cuneiform 2	22	2
Sphenoid	19	9	Fibula	29	9	Cuneiform 3	26	0
Mandible	47	15	Scaphoid	28	0	MTT 1	23	6
Vomer	2	1	Lunate	19	1	MTT 2	22	3
Hyoid	13	1	Triquetral	17	1	MTT 3	21	2
Atlas	37	7	Pisiform	7	0	MTT 4	23	1
Axis	33	9	Hamate	25	1	MTT 5	19	2
Thoracic 1	35	6	Capitate	26	1			
Clavicle	34	17	Trapezium	18	0			
Rib 1	31	20	Trapezoid	13	0			
Sternum	27	6	MTC 1	33	5?			
Scapula	44	12	MTC 2	30	1			
Humerus	49	21	MTC 3	30	1			
Ulna	41	13	MTC 4	21	1			
Radius	41	11	MTC 5	33	1			

Table III. TD 1, sector D: bone frequencies.
Tableau III. TD 1, secteur D : fréquences de pièces osseuses.

	M	Comments	UNDET	Comments
Left	2 (m p=0.9994, p=1)	1 young adult (14-23 y; Owings-Webb, Myers-Suchey, 1985)	1 (m p=0.58)	Male under the Bruzek visual method
Right	1 (m p=0.995)	Female under the Bruzek visual method	1 (m p=0.06)	young adult (14-23 y; Owings-Webb, Myers-Suchey, 1985) Undetermined under the Bruzek visual method (3/5 characters observable)

Table IV. TD 1, sector D: results of the sex diagnosis for the
adult/young adult os coxae with desiccated soft tissue remains.

*Tableau IV. TD 1, secteur D : résultats de la diagnose sexuelle pour les os coxaux
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