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BY STONES AND BY KNOTS: THE COUNTING AND RECORDING OF CHILI PEPPERS STORED
DURING THE INCA OCCUPATION OF THE GUARCO ADMINISTRATIVE CENTER OF
HUACONES-VILCAHUASI, LOWER CAÑETE VALLEY, PERU

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INTRODUCTION

Huacones-Vilcahuasi is an important archaeological site on the Peruvian South Central Coast (Figure 1). It has been characterized not only as the biggest and most important architectural complex in the lower Cañete Valley (Engel 2010:170; Williams and Merino 2006 [1974]: 97), but also as the possible capital or center of political-administrative power of the Kingdom of Guarco (Campos 2007:60; Hyslop 1984:89). The recent discovery of some recording elements for accounting (*khipus* and a *yupana* impressed into a floor) at this site and areas for storing chili peppers (*Capsicum baccatum* and *Capsicum chinense*) associated with private spaces, have led us to evaluate the extent to which these finds could reflect idiosyncratic features of traditional regional accounting practices, continued by local elites after their incorporation into Tawantinsuyu, and the value this product would have had among Guarco power groups.

This case study is discussed within the broader context of accounting and storage

practices displayed by the kingdoms of the Central and South-Central Peruvian Coasts before the Inca expansion into the area. Likewise, we explore some ideas about the function and importance of the *yupana*, an Inca accounting device rarely found in archaeological excavations.

BACKGROUND

The efficient management of the resources stored by the Inca state was a key element in its consolidation. It was from the surpluses of production and the accumulated goods in the state storerooms, obtained thanks to the rotational labor taxation (*mita*), that the Incas acquired the capacity to feed, dress, and prepare the work parties and government agents sent to the provinces (officials, troops, *chasquis*, *mitmas*, etc.). Every day these forces moved the gears of Tawantinsuyu. Furthermore, the stored resources permitted the consolidation of alliances with local power groups and the rewarding of them for their loyalty or services to the state and, in times of disaster, allowed the Inca to help affected populations.

This storage was of the redistributive type. To be precise, it was based on the accumulation of products (agricultural, fishing, mining, etc.) on a large scale, inside storerooms or silos, integrated with a centralized administrative system. Usually, the accumulated goods were delivered to various sectors of the population (in the form of rations or gifts), as compensation for personal services rendered. They could also be destined to supply other institutions that formed the system, to be consumed during banquets and integrative feasts, or to be used as exchange goods (Pfälzner 2002:261). As it has been postulated for other ancient societies, the practice of this kind of storage and the need to efficiently control the redistribution of large quantities of resources, had to imply the formation of a specialized group of officials who were responsible for recording and accounting for the production delivered by the tributaries, the resources stored in the storerooms, and the redistributed goods (Finer 2003 [1997]:100, 235; Hunt 1991:152–153; Schmandt-Besserat 1982:876).

The most basic level of recording, at the time of receiving the tax, consisted not only in indicating the identity of the person or collectivity who was involved in the delivery, but also in consigning the type and number of products involved. From these data, it was possible to make inventories which, upon the subsequent arrivals or deliveries of the stored products, were updated by registering quantitative fluctuations (Nissen *et al.* 1993:11).

In the Inca case, we have the testimony of various colonial chroniclers who highlight the role that, the *kipucamayos* or “official accountants” had in these tasks.¹ They were in charge

of the *kipus* (quipus) or knotted cords (Acosta 2002 [1590]:385–386; Cieza 1996 [1553]:31; Garcilaso 2005 [1609], I:128–129; Murúa 2001 [1611]:359–361). Among all these testimonies, the one by the Chachapoyan Jesuit Blas Valera in his *Historia Occidentalis* (c. 1595) stands out. This has reached us through the Inca Garcilaso:

They also took into account what was in the storerooms of every town. The law required that the Inca governor of the province keep a copy of the accounts of all the things under his control, so that there not be any falsifications on the part of Indian tributaries, nor on the part of the tax collector (Valera cited in Garcilaso 2005 [1609], I:287; translation by the authors).²

The requirement of the Inca state for precise control of the accounts through the “transfers” mentioned by Valera has been confirmed by Gary Urton as a result of systematic analysis of the numerical sequences recorded in the *kipus* in archaeological collections with known provenances (Incahuasi in Cañete and Laguna de los Cóndores in Chachapoyas) that sometimes include duplicate *kipus* or ones that are closely concordant. Based on this evidence, Urton has been able to recognize that prehispanic *kipucamayos* maintained certain accounting practices analogous to those carried out by ancient Mesopotamian managers, such as a system of checks and balances, which included balancing credits and debits and the inspection of “annotated/knotted” accounts in places far from where they were created (Urton 2005:164, 2010:62; Urton and Chu 2015:515).

(Moscovich 2014:107–114; Ramos 2016:38–42).

¹ It should be pointed out that the field of action of the Andean *kipucamayos* was not restricted to accounting. Under the Inca regime, the *kipu* management specialists carried out a wide range of functions related to administration, law, historical record keeping, astrology, etc.

² También daban cuenta de lo que había en los pósitos de cada pueblo. De todas las cuales cosas mandaba la ley que el Inca gobernador de la provincia tuviese un traslado de las cuentas en su poder, para que ni de parte de los indios tributarios ni de parte de los ministros cobradores hubiese falsedad alguna.

It is possible, however, that similar activities (although with less centralization and on a smaller scale) were carried out by the accountants of some kingdoms of the Central and South Central Peruvian Coast (Ychsma, Guarco, and Chincha) even after they became part of Tawantinsuyu. The available archaeological evidence suggests this hypothesis.

In Pachacamac, the base of the Ychsma government, for example, groups of square and rectangular storerooms were built in the back of, or next to, the pyramids with ramps (Eeckhout 2012:215–216; Franco 1998:19; Paredes 1988: 51–52; Paredes and Franco 1987:7; Ramos 2011:105–106). Their association with this type of architecture of power has led those structures to be conceptualized as buildings for storage and redistribution of taxes (Díaz 2008:119; Eeckhout 2004a:406; Farfán 2004:455; Franco 2004:467).³ In some cases, the storerooms were covered with dry sand, possibly collected on the banks of the Lurín River, to guarantee the preservation of food stored there (Franco 1998:19).

The same situation has been observed in the pyramids with ramp of other late settlements of the Lurín Valley, such as Pampa de las Flores and Tijerales, where remains of corn and cotton have been encountered inside storerooms (Eeckhout 2003:147, figure 8; 2012:217).

In the Rímac Valley, in a similar way, the residences of the Ychsma elites had an administrative area formed by a courtyard associated with a terrace (comparable to the Chimu *audiencia*), where bureaucratic activities were carried out, and by a series of smaller interior rooms for storage (Villacorta 2003:160, 2005:174). As at Pachacamac, these internal storerooms presented a square or rectangular shape, and were organized in compartments following an orthogonal pattern. The fact that they were often placed at a different level necessitated access via stairs or epimural paths (Espinoza 2014:142).

Further south, at Las Salinas de Chilca, rectangular storerooms specially conditioned with sand fill were used during the Late Intermediate Period to store large quantities of dried and salted anchovies. According to Manuel Aguirre-Morales (2008:171), fishing surpluses were preserved to be exchanged with highland populations.

Mass storage of dried fish has also been reported in El Huarco-Cerro Azul, a contemporaneous site on the coast of the present province of Cañete. There, at least eight elite residential complexes included storage facilities filled with clean sand. In those, important amounts of anchovies, sardines and, occasionally, other dehydrated small fish were gathered (Marcus 1987:53, 56–57). Joyce Marcus (*ibid.*:41, 2008:84) has proposed that some of these resources would have been part of a regional exchange network, through llama caravans, being traded for corn and camelid fibers from other sections of the valley.

Taking into account these antecedents, particularly the partially centralized storage of tax revenues in the storerooms of regional elites, we can propose that kingdoms from Central and South Central Coast during the Late Intermediate Period would not only have had trained *kipu* management officials, but also have had

³ Throughout the study of prehispanic storage practices in Pachacamac, Peter Eeckhout has been able to recognize that during the Late Intermediate Period “the management of storehouses was not in the hands of a force extending over the entire site, but, instead, was divided among different groups, each based at one of the several pyramids with ramp . . . each pyramid had its own stores, which varied a great deal in terms of number and capacity” (Eeckhout 2012:216). Therefore, it was partially centralized storage.

local calculation technologies.⁴ In support of this approach, it is important to remember that it is from these same regions that the earliest evidence of accounting *kipus* in the Andean region has been found (Brokaw 2010:85; Shady *et al.* 2000:13–14; Urton 2014:206–207). These *kipus*, which belong to Middle Horizon 2 (c. 700–850 A.D.), correspond to the “round wound” type and were recorded in the area between the lower Rímac Valley (Huaca San Marcos) and the Santa Cruz Valley, in the province of Palpa, Ica (Pampa Blanca site).

Urton has argued that Quechua speaking *kipukamayus* who maintained ancient regional traditions of the Rímac and Lurín Valleys could have fulfilled a central role in the transition from the use of a quinary numeral system (base 5), linked to the Wari tradition, to the use of the well-known decimal system imposed by the Incas (Urton 2014:219). After recognizing the existence of notable variations in the dimensions, structural characteristics, and color patterns of the *kipu* collections from Pachacamac, he has proposed that this diversity could reflect the arrival of *kipus* from different traditions far away from the sanctuary, artifacts that would have accompanied the gifts and offerings brought by pilgrims (Urton 2017:121). According to Urton, “Pachacamac may in fact have been a place of exceptional importance in the history of the development and evolution of cord keeping in Tawantinsuyu” (Urton 2017: 122).

In any case, the fact is that the Inca state used less invasive administrative strategies in

the jurisdictions of some kingdoms of the Central and South Central Coasts, such as the Ychsma, Guarco, and Chíncha (Covey 2003:186). Focusing more on the exploitation and intensive administration of the peripheral areas of *chaupiyunga* (warm and humid areas) designated for the cultivation of coca and corn suggests that this strategy could be explained by the pre-existence of an entire administrative apparatus developed by the local elites (with their own accounting traditions) which, due to their compatibility with Inca practices, it was advisable to continue.⁵ Thus, it would have been less onerous for the state to maintain indirect control of these regions.

One should ask, then, how the accounting and recording practices of these provincial groups (at least those of a local nature) would have been carried out once they were incorporated into Tawantinsuyu. Did they continue to perform according to their old usages, or did they adjust to the new state models? We will continue with these questions later.

KHIPU FINDS ASSOCIATED WITH PREHISPANIC STORAGE IN THE CENTRAL ANDES

Since the last decades of the past century, discoveries of *kipus* associated with storage areas have been reported from several sites on the Peruvian coast that were occupied by the Incas, confirming the close link between the practices of mass storage and the development of accounting and recording techniques.

⁴ The possibility that old regional traditions of *kipuca-mayos* existed in Tawantinsuyu with different logics and procedures from the ones made by the state officials, has already been suggested by Gary Urton (2010:64). In the specific case of Pachacamac, Franco (2004:483) has pointed out that the use of *kipus* for the administration of chili pepper, cotton, corn, and gourd found in store-rooms could have preceded the Inca regime.

⁵ In the Cañete and Chíncha Valleys, the management of *kipus* by the regional indigenous elites continued until the end of the sixteenth century, being sometimes required by the Spanish colonial authorities (Cabildo de Lima 1937 [1575–1578]:11; Hampe 1985:127).

Pachacamac

In 1998, the archaeologist Régulo Franco reported the discovery of some *kipus* “colorados” (reddish) inside a small niche in the inner corner of a secondary storeroom at Pachacamac’s Pyramid with Ramp N° 2 (Franco 1998: 19). In his opinion, the artifacts would have served for “accounting for what was collected” in this feature.

In more recent years, at least nine *kipus* made with fine white cotton strings, provided in some cases with colored knots, were found by Peter Eeckhout and his team on the floor of a platform inside a small rectangular enclosure that controlled the entrance to the storage complex called Building 8 (Edificio 8). This is at the northern end of the sanctuary of Pachacamac, in association with circulation routes (Eeckhout 2012:219–220, figure 9; Eeckhout and Luján 2013:16, figure 4).

Building 8 is formed by a large courtyard (80 by 60 meters) and twenty sunken storage enclosures (U101–120) which were accessed through epimural paths. The storerooms are square, and were distributed in two parallel rows, with ten structures per row. Excavations in the complex have allowed us to recognize that a great diversity of crops, including peanuts, chili peppers, *macre* and *loche* pumpkins, beans, cotton, lucumas, guavas, and corn were stored there (*ibid.*: 18). Moreover, in one of the containers (U112) located behind the rectangular enclosure where the *kipus* (“Room of the Khipucamayoc”) were found, a collection of gourds was recorded. These were possibly used in banquets and feasts in the courtyard of the building (*ibid.* 2013: 32–33, figure 13).

In the opinion of Eeckhout (2012:220), Building 8 would have been occupied by an official responsible for managing the goods that came to this complex, perhaps through llama

caravans that were unloaded in the adjacent courtyard.

Tambo Viejo, Acarí

Rescue excavations carried out in 1990 in the Inca administrative center of Tambo Viejo, in the Acarí Valley (south of Nazca), led to recovery of a *kipu* associated with an alignment of square and rectangular structures identified as Inca storerooms. The artifact was found at the top level of a stairway that led to a narrow passageway interconnected with four of the square warehouses (Menzel *et al.* 2012:422, figure 14; Valdez 1996:40–41).

Incahuasi of Lunahuaná

During 2013 and 2014, a total of thirty-four *kipus* were recorded from excavations directed by Alejandro Chu in the storage complex of Qolqawasi at Incahuasi (Lunahuaná, Cañete Valley; Urton and Chu 2015:518).

In a long enclosure (U.A. 7) of this complex, provided with a drying area, two “linked” *kipus* (*kipus* with their primary strings attached to each other) were placed rolled together next to a third specimen, inside a basket covered with chili peppers. In a nearby structure (U.A. 4), remains of peanuts and black beans were found in association with another fourteen *kipus* (Urton 2017:159, 177–178; Urton and Chu 2015:figure 4).

Gary Urton’s analysis of these materials allowed him to reconstruct the entire process of naming, counting, and recording of food crops that took place in this settlement, recognizing that the accountants made copies of the *kipus* to facilitate the additions and subtractions that are part of the calculations, and to specify that the linked *kipus* reflect accounting practices of control and balance made to ensure the accu-

racy of the records (Urton 2017:170–174; Urton and Chu 2015:520, 526–527).

PREHISPANIC ACCOUNTING PRACTICES ACCORDING TO COLONIAL SOURCES

Several researchers have stressed that although the *kipus* were used to record numerical values produced as a result of mathematical operations, they were not devices for calculations.⁶ Those were made by the manipulation of stones and seeds on surfaces specially designed as “abacuses” called *yupana*⁷ in Quechua (Locke 1912:330, 1923:32; Rostworowski 1990:61, 2005:40; Rowe 1946:326; Urton 2003a:29, 2010:55; Wassén 1990 [1931]:211).

Indeed, several sixteenth and seventeenth century chroniclers briefly mention the accounting operations carried out by the ancient Andean inhabitants through stones, grains of maize, and beans (Francisco López de Gómara 1852 [1552]:278; Juan de Matienzo 1967 [1567]:21; Polo de Ondegardo 1916 [1571]:

124; José de Acosta 2002 [1590]:386–387; Martín de Murúa 2004 [1590]:159; the Inca Garcilaso de la Vega 2005 [1609] Volume I:128; Antonio de Herrera (1615):105; and Juan de Velasco 1981 [1789]:28, cited in Curatola and de la Puente 2013:200–203; Wassén 1990 [1931]:211–213). Some of these mentions are transcribed below:

Each *parcialidad* has a principal cacique who gives orders to the headmen and Indians of his *parcialidad*, and he does not intervene by giving orders to the other [*parcialidad*], except that the *curaca* of the *parcialidad* of Hanansaya is the principal of the whole province, and he who the other *curaca* of Hurinsaya obeys in the things that he says . . . The caciques and principals their work is relaxing and drinking and counting and distributing, in which they are very skillful, more than any Spaniard, and they count slowly and with their stones of many colors, that certainly is something to see (Matienzo 1967 [1567]:21–22; translation and emphasis by the authors).⁸

So that for everything there should be an account, order, and reason, at a certain specified time they gather together in the main town of every province the tax collectors and the accountants or scribes who had the knots and accounts of the taxes. And in front of the *curaca* and the Inca governor they made the accounts and divisions by means of the knots of their strings and with little stones, according to the num-

⁶ As noted by Henry Wassén in the 1930s, it would have been impractical to calculate accounts with *kipus*, sometimes requiring the undoing of very strong and well done knots (Wassén 1990 [1931]:211).

⁷ The term *yupana* (from the Quechua word *yupani* “to count” plus the nominalizer “-na”), in the sense of “calculation board”, is far from constituting a neologism as has been claimed (Chirinos 2010:177). On the contrary, it is recorded in the first Quechua vocabulary published, with the meaning of “counting board” (Santo Thomas 1560, I: 98v.; see also Moscovich 2006:100). About this artifact, Guaman Poma wrote: “Major accountant *hatun hucha quipoc*, minor accountant *huchuy hucha quipoc*, count with boards, numbering one hundred thousand, and ten thousand, and one hundred, and ten, down to one, of everything that happens in this kingdom it settles” (Guaman Poma 2008 [c. 1615], I: 274 [361]; translation and italics by the authors). “Contador mayor *hatun hucha quipoc*, contador menor *huchuy hucha quipoc*, cuentan en tablas, numeran de cien mil, y de diez mil, y de ciento, y de diez, hasta llegar a uno, de todo lo que pasa en este reino lo asienta.”

⁸ Cada *parcialidad* tiene un cacique principal que manda a los principales e indios de su *parcialidad*, y no se entremete a mandar a los de la otra, excepto que el *curaca* de la *parcialidad* de hanansaya es el principal de toda la provincia, y a quien el otro *curaca* de hurinsaya obedece en las cosas que dice el . . . Los caciques e principales su oficio es holgar, y beber, y contar y repartir, que son muy diestros en esto, más que ningún español, y cuentanlo de espacio y con sus piedras de muchas [sic] colores, que cierto es cosa de ver.

ber of the inhabitants of the province” (Valera (c. 1595) cited in Garcilaso 2005 [1609], I:286; translation and emphasis by the authors).⁹

They knew a lot about arithmetic and in an admirable way. With knots made on strings of different colors they gave an account of everything in the Inca kingdom concerning taxes and contributions by charges and discharges. They added, subtracted, and multiplied by those knots. *And in order to know what pertained to every town they made the distributions by means of grains of corn and little stones, in a such a way that they made their account certain* (Garcilaso 2005 [1609], I:128; translation and emphasis by the authors).¹⁰

As can be noted, these sources are quite succinct in reference to Andean accounting practices, and basically they are limited to mentioning the use of stones of different colors and grains of maize,¹¹ without offering more

details about the type of facilities or actions involved in the calculations.

From these quotations we can deduce that sometimes it was the *curacas* themselves who were in charge of “counting and sharing”. The competence with which these indigenous authorities had to accomplish accounting operations was complemented by the knowledge that many of them possessed of the management of *kipus* (Medelius 2011a; Ramos 2016:52–3, table 1). The principal lord of the province of Huarochiri, Sebastián Quispe Ninavilca, for example, received, in 1581, the title of *Alcalde mayor, kipucamayoc, and counter of the chasquis* of Huarochiri, Jauja, and the valley of Lima (Espinoza 1960:224, note 11).

The event of making “accounts and divisions” described by Valera, in which a local *curaca* had to interact with the representatives of the Inca state, is particularly interesting, because, according to the testimony quoted, these administrative acts were performed “in the main town of every province”. As we will see later, this is a relevant fact for our case study.

Without delving into minute details, other chronicles and colonial reports provide more information on the actions performed in those sessions.

In this *repartimiento* of Paria] there are three *parcialidades*: the one of the fishermen called Huros, who are more than half, and some want to say two thirds; the others are called Casayas, and the other *parcialidad* are Indians [called] Suras who,

⁹ Para que en todo hubiese cuenta, orden y razón, a cierto tiempo señalado se juntaban en el pueblo principal de cada provincia los jueces cobradores y los contadores o escribanos que tenían los nudos y cuentas de los tributos. Y delante del curaca y del gobernador Inca hacían las cuentas y particiones por los nudos de sus hilos y con piedrezuelas, conforme al número de vecinos de la tal provincia.

¹⁰ De la aritmética supieron mucho y por admirable manera. Que por nudos dados en unos hilos de diversos colores daban cuenta de todo lo que en el reino del Inca había de tributos y contribuciones por cargo y descargo. Sumaban, restaban y multiplicaban por aquellos nudos. Y para saber lo que cabía a cada pueblo hacían las particiones con granos de maíz y piedrezuelas, de manera que les salía cierta su cuenta.

¹¹ Counting with grains of maize seems to have been a widespread practice in the Andean region from prehispanic periods until very recent times. During the inspection tour (*visita*) of the Valley of Jayanca in Lambayeque carried out by Sebastián de la Gama in 1540, for example, the principal Lord of this locality reported that the total population of its chiefdom amounted to 370 Indians

“counted by maize” (Espinoza 1975:269). In modern times, this type of counting was maintained in some Andean communities, although in ceremonial contexts, as part of very traditional celebrations. This practice has been found in the Huarochiri villages of Anchucaya (Hyland 2016:493) and San Pedro de Casta (Llanos and Osterling 1981:29–30; Olivas 1983:65) in the highlands of the department of Lima, and in some communities of the Peruvian southern highlands (Revilla 2006:24).

in order to divide this eleven thousand pesos, they gather, from among everyone, about thirty prominent Indians and *quipocamayos* who are their accountants or *marcamayos* [*sic: marcacamayos*]; and that being the case, they stay [giving] testimony *with their stones and grains of corn* and the beans put on the floor with which they make their accounts in the usual way. Finally, in less than three hours, before me, each *parcialidad* knew what it had (Ondegardo 1916 [1571]:164; translation and emphasis by the authors).¹²

To watch them [employ] another kind of *qhipus that use grains of corn* is pleasing. Because a very difficult account, which a very good accountant had to put down in pen and ink, to see how it fits in with so many others, so many contributions, subtracting some from there and adding some from here, with other tangled speech, *these Indians will take their grains and put one here, three there, eight I do not know where; they will move one grain from here, exchange three from, there, and, in fact, they end up with their accounts very accurate, without making the smallest mistake; and they know much better how to balance the accounts than those who must pay or give, than we know how to do it, reconciling with pen and ink* (Acosta 2002 [1590]:

386–387; translation and emphasis by the authors).¹³

As expressed in the testimony of Polo de Ondegardo, in these calculation exercises, which could last several hours, many local authorities participated: accountants and *kipucamayos*, which necessarily determined the space where they performed their actions. These had to be wide open areas (patios or plazas). Likewise, in the two quotations transcribed above, it is reported that these computations were not silent events, they discussed matters simultaneously, producing “retartalillas”, which we translate as “tangles of words, speeches and small harangues” (Oudin 1616, I:516; translation by the authors).¹⁴

The operations were carried out not only with small stones or grains of corn, but also with beans put “on the floor”. Therefore, a *yupana*, or portable board similar to that represented by the chronicler from Lucanas, Felipe Guaman Poma de Ayala, with his portrait of the *curaca* Condor Chaua “senior accountant and treasurer” of the Incas was not necessarily required (Guaman Poma 2008 [c. 1615], I:272[360]). As it has already been pointed out (Assadourian 1998:40, 2002:125; Engel 1987:245), it is possible that accounting squares with subdivisions could have been outlined directly on the floor or, even in

¹² En este repartimiento de Paria] ay tres parcialidades: la una destos hueros pescadores, que serán más de la mitad, e algunos quieren decir que las dos partes; los otros se llaman casayas, e la otra parcialidad son yndios çuras, los quales para dividir estos onze myll pesos se juntan de todos como treinta yndios principales e quipocamayos que son sus contadores o marcamayos [*sic: marcacamayos*]; y puesto [el] caso quedan [dando] voces con sus piedras e machizes [*sic: maíces*] [e] los frisoles puestos en el suelo con que hacen sus quantas por la horden acostumbrada. Finalmente, en menos de tres [h]oras supo [*sic: supieron*], delante de my, cada parcialidad lo que le cavía.

¹³ Vverles otra suerte de quipos que usan de granos de maíz, es cosa que encanta. Porque una cuenta muy embarazosa, en que tendrá un muy buen contador que hacer por pluma y tinta, para ver a cómo les cabe entre tantos, tanto de contribución, sacando tanto de acullá y añadiendo tanto de acá, con otras cien retartalillas, tomarán estos indios sus granos y pornán [*sic: pondrán*] uno aquí, tres acullá, ocho no sé dónde; pasarán un grano de aquí, trocarán tres de acullá, y en efecto ellos salen con sus cuentas hechas puntualísimamente, sin errar un tilde; y mucho mejor se saben ellos poner en cuenta y razón de lo que cabe a cada uno de pagar o dar, que sabremos nosotros dárselo por pluma y tinta averiguado.

¹⁴ “Retartalillas” can be defined as “enredos de palabras, discursos y pequeñas arengas” (Oudin 1616, I:516).

humid sand “instead of being a piece built *ex professo*” and that, because of the simplicity of the lines and the ease of execution, the accountants would have had “the freedom to create at any time boards with numbers of columns and squares according to the complexity of the calculation that is going to be made” (Assadourian 1998:14; translation by the authors).¹⁵

It was surely from one to another of these columns and squares that the accountants “exchanged” (Acosta 2002 [1590]:386–387) the stones and grains. It has been pointed out that these movements had to be carried out with considerable speed (Assadourian 1998:14, note 28; Curatola and de la Puente 2013:217, note 29). However, taking into consideration the testimony of Juan de Matienzo, who noted that these accounts were made “slowly” (Matienzo 1967 [1567]:22), and the several hours that these sessions could take, the most feasible thing is that there would have been pauses in the execution.

The sixteenth and seventeenth century dictionaries of indigenous languages constitute another line of evidence providing important information about prehispanic accounting, complementing that of the chronicles and colonial reports. In the dictionaries of the Quechua language compiled by Diego González Holguín (G.H.) and Domingo de Santo Thomas (S.T.), for example, we find various terms related to this activity (Table 1).

The Jesuit Ludovico Bertonio (B.), in his *Vocabulary of the Aymara Language* (1612), also includes some entries (Table 2) linked to indigenous accounting, specifying, among other things, the meaning of the colors (white or black) of the stones used in the calculations.

¹⁵ La libertad de crear en cualquier momento tableros con números de columnas y casillas acordes con la complejidad del cálculo que se va a realizar.

<i>Quechua terms</i>	<i>Spanish/English translation</i>	<i>Reference</i>
Chuncachini, o chuncacharcarini	Contar por diezes en montones To count by piles of tens	GH 1608, I: 103
Chuncachasccatam yayanchani	Sumar los diezes o cientos o miles en un tanto y quitar los montones ¹ To sum up tens or hundreds or thousands in one counter or token and to remove the piles	GH 1608, I: 113
Churaycuni rumihuan, qquipuhuan o qquellcahuan	Dar quantas por tantos por ñudos o por escrito To render accounts by counters or tokens or knots or written	GH 1608, I: 115
Llullaquipu	Cuentas falsas Falsified accounts	GH 1608, I: 213
Quippoy, quiposca	Cuenta Account	ST 1560, II: 171
Qquipu pucuni	Dar quantas To render account, accounting	GH 1608, I: 308
Qquipucta ttiuni	Sumar juntar todas las quantas To add and consolidate all the accounts	GH 1608, I: 308
Qquipuni	Contar por ñudos To count by knots	GH 1608, I: 308
Qquipucamayok	Contador por ñudos Accountant who uses knots	GH 1608, I: 308
Qquipucama o manta huatucuni	Contar llamando por ñudos To count by calling out knots	GH 1608, II: 87
Qquipucta huñuni	En las quantas sumar To total the accounts	GH 1608, I: 199
Qquipucunacta	Ajustar quantas To adjust accounts	GH 1608, II: 22
Taripani qquipucta o yupayta	Averiguar o tomar quantas To verify or make accounts	GH 1608, I: 339
Taripascca yupaycuna o qquipocuna	Quantas averiguadas acabadas Reconciled closed accounts	GH 1608, I: 339
Yayanchani	Abreviar, o sumar las quantas . . . que es de diez tantos dexarlos en uno que se llama yayan To abbreviate, or to total the accounts . . . that is of ten tokens converted to one that is called <i>yayan</i>	GH 1608, II: 6
Yayanchascantam huañuycuni	Resumir todos los diezes y cientos a un número To sum up all tens and hundreds in one number	GH 1608, I: 113
Yupana, o qquipo	Tabla para contar Board for counting	ST 1560, I: 98v
Yupana qquipu	Las quantas por ñudos The accounts by knots	GH 1608, I: 373

¹ This accounting method of replacement or simplification of ten ones, units of tens, or with “one token” called *yayan* largely corresponds with the counting modality called *layqa* reported by Óscar Núñez del Prado for Paucartambo, Cusco, in the middle of the last century (Núñez del Prado 2005 [1950]:181). The same principle of simplification was used by the natives of Cusco during the first half of the last century when they made transactions with money (Fernández Baca 1934:67–68).

Table 1. Terms in colonial Quechua dictionaries linked to accounting practices.

<i>Aymara terms</i>	<i>Spanish/English translations</i>	<i>Reference</i>
Cala paachatha	Poner dos piedras en la cuenta, quando no hay mas de una To put two stones in the account, when there is no more than one	B 1612, II: 240
Calana apanocatha, iranocatha, saraatha, vel inocatha ¹	Contar por piedrecitas To count with small stones	B 1612, I: 139
Cchaara “black” Hanko “white”	Piedra cuenta para contar lo que se deve ... Para lo que se ha pagago ... Stone token for counting what is owed ... For what has been paid ...	B 1612, I: 367
Cchaara	Piedrecita de contar lo que se debe de la tassa y otras cosas Small stone for counting what it is owed of the assessment, and other things	B 1612, II: 72
Chino	La cuenta que señalan por ñudos de lo que se da, o recibe The account that indicates by knots what one gives or receives	B 1612, II: 83
Chinocamana	Uno que tiene cuenta de lo que se deve, contador One who has an account of what is owed, accountant	B 1612, II: 83
Chinona haccutha	Contar por ñudos To count by knots	B 1612, I: 139
Chinokharatha	Contar mal añadiendo To count, adding badly	B 1612, I: 139
Chinoquipatha	Contar mal pasando [dejando pasar] algo To count badly by omitting something	B 1612, I: 139
Chinositha, vel chinottasitha	Poner en cuenta añudando al modo de indios To make an account by knotting in the manner of Indians	B 1612, I: 375
Chinotha	Poner en la cuenta To account for	B 1612, II: 83
Inocatha. Calaro inocama	Contar con piedras To count with stones	B 1612, II: 174
Phiscachatha	Poner cinco en la cuenta quando la hacen por piedrecitas To put five into the account when it is done with stones	B 1612, II: 270

¹ In this Aymara record it is specified that there were, at least, two ways of counting with *cala* “stone”: distributing them on the floor (*apa nocatha* “put down” and *iranocatha* “put on the floor or down”) and putting them inside any kind of vessel/container (*inocatha* “put something in some place, like a vessel, in a sack, etc.”) (Bertonio 1612, I: 376; II: 22, 178; see also Platt 1987:86–87). This second method reminds us of an eighteenth century story written by the Jesuit Juan de Velasco who, making a reference to the recording system of the indigenous people from Quito, describes “certain archives or storerooms made of wood, stone, or mud, with diverse separations, in which they placed stones of different sizes, colors, and angular figures, because they were excellent stone carvers. With the diverse combinations of them, they perpetuated their facts and they formed their accounts of everything” (Velasco 1981 [1789]:11; translation by the authors).

Table 2. Terms in the Vocabulario Aymara by Ludovico Bertonio linked to accounting practices.

As we can see, the information contained in these lexicographical sources allows us to specify several aspects of the practices of prehispanic accountants, such as the use of black stones to calculate what is owed and white for what has already been paid (debits and credits), the use of “counters”, called *yayan* in Quechua, to simplify the decimal count done with pebbles, the manipulation of calculation boards called *yupana*, and the sonority of these administrative events to “count by calling by knots”. Likewise, the entry *phiscachatha* “putting five in the account when they do it by stones”, in Bertonio’s Ayмара dictionary, appears to refer to the quinary numbering system proposed for the groups that spoke that language (Urton 2014:218).

We have a third type of colonial source useful for our study. These are archival documents generated in the context of litigation between indigenous groups (represented by their *curacas* and *kipucamayos*) and Spanish officials or encomenderos. The great contribution of these documents is that they describe the acts carried out by the Andean accountants as seen by the scribes or witnesses who transmitted the information. This is, therefore, a first-hand record with valuable details.

One of these documents is the over-charging lawsuit filed in 1572 against the encomendero Alonso de Montemayor in the village of Sacaca, in the former Bolivian province of Charcas. At that time, the main cacique and *kipucamayo* Hernando Achacata

. . . took out some strings of different strings [sic: colors], with knots saying that those were the said *kipus* and account of what they gave during the specified time [of four years] and together with these, placed certain stones, collating them with the said *kipus* . . .” (cited in Pärssinen and

Kiviharju 2004:273; translation and emphasis by the authors)¹⁶

Then Achacata proceeded to number the quantities of goods that year-by-year they had paid in tribute to the encomendero. In a similar way, two other principals and *kipucamayos* of Sacaca, don Luis Anba and Pedro Horuro, showed their accounts respectively, “having in their hands some strings of different colors with many knots” and “putting [on the floor] certain small stones. . . .” (cited in Pärssinen and Kiviharju 2004:281, 289).

Six years later, on 10 October 1578, these same *curacas-kipucamayos* presented their accounts again, in the city of La Plata, in the presence of the notary Juan García Torrico. At this time:

It was asked of them that they show the *kipus* they had had of the four years they said they paid their tax and later they demonstrated before me, the present scribe, a bunch of woolen cords, some white and others of other colors with certain knots, both the said don Hernando Achacata and don Luis [showed] his bunch on which they said they had the account of all four years of what they gave to their encomendero and to his mayordomos. . . . And later they were asked to show by the *kipus* what they gave to don Alonso and to other people in his name during the first year of the four during which it was said they had paid no taxes. *And they took their kipus in their hands . . . and put some stones on the floor by which they were calculating their account, together with the kipus, saying the following . . .”* (cited in Pärssinen and Kiviharju

¹⁶ . . . sacó unos cordeles de diferentes colores [sic: colores], con nudos diciendo que aquellos eran los dichos quipos e cuenta de lo que así dieron en el dicho tiempo [de cuatro años] y juntamente con éstos puso ciertas piedras cotejándolas con los dichos quipos. . . .

2004:303; translation and emphasis by the authors).¹⁷

The simultaneous “collating” of *kipus* and calculation stones presented in these testimonies corroborates the information given by the Inca Garcilaso in his *Royal Commentaries* on the complementarity of these elements when tax accounts were made (Garcilaso 2005 [1609], I: 128; see also Curatola and de la Puente 2013: 203–204; Urton 2003b:126). The case of Sacaca, in addition, allows us to confirm that on the *kipus* only the total sums of the accounted goods were recorded, not the particularities of each one of the addends, as reflected in the following statement:

They were asked how many heads they give to their *encomendero* for eating; they said the *kipu* where they had set it down has a summary of everything in the way it has been said and they cannot give a reason for how many they give in particular for eating, moreover everything is included in the total (cited in Pärssinen and Kiviharju 2004:333; translation by the authors).¹⁸

¹⁷ Fueles pedido que muestren los quipos que an tenido de los quatro años que dizen que le pagaron su tasa y luego hizieron demostración ante mí el presente escrivano de unos manojos de cordeles de lana, unos blancos y otros de otras [sic] colores con ciertos nudos, cada uno de los dichos don Hernando Achacata y don Luis su [respectivo] manajo en que dixeron tener la quenta de todos los dichos quatro años de lo que han dado al dicho su encomendero y a sus mayordomos. . . . E luego les fue pedido que muestren por los dichos quipos lo que dieron al dicho don Alonso y otras personas en su nombre el primer año de los quatro que dizen que no tuvieron tasa. E tomaron sus quipos en las manos . . . y puestas unas piedras en el suelo por las quales fueron haziendo su quenta, juntamente con los quipos, dixeron lo siguiente . . .

¹⁸ Fueles preguntado cuántas cabeças davan al dicho su encomendero para comer los quales dixeron que el quipo donde le tenían asentado lo vinieron a resumir todo en la forma que tienen dicha y no pueden dar razón cuántas le davan en particular para comer, mas que todo entra en la

Marco Curatola and José Carlos de la Puente published another document with similar characteristics (Curatola and de la Puente 2013). This was produced between the years 1580 and 1581 during the judgement of office (*residencia*) of Juan Manuel de Anaya, former corregidor of the province of Lucanas, in what is now Ayacucho. As was the *encomendero* of Sacaca, he was accused of having demanded excessive taxes.

In this case, we have the testimony and accounts of Don Alonso Quilcapaucar “major *kipucamayoc* accountant” of Atunsora and of Don Pedro Soramarca, principal of Atunsora, who was also a *kipucamayoc*, although of lower rank. On that occasion, the notary Pedro de Ayala gave testimony:

that in a *patio* where this judicial proceeding took place, the said Indians *had made some stripes on the floor and placed grains of maize and stones in a row* which is the way they say is their account (cited in Curatola and de la Puente 2013:233; translation and emphasis by the authors).¹⁹

This is the most detailed colonial description that has come down to us of an installation prepared to calculate with stones, grains of maize, and *kipus*. The “stripes on the floor” of the courtyard remind us of the “columns and squares” which, according to Assadourian (1998:14), were used by Andean accountants.

The fact that the actions occurred in a *patio* is consistent with the collective nature of these events and their prolonged duration, confirming, moreover, that under the colonial regime they implied “a long and complex performance”

dicha suma.

¹⁹ Que en un patio donde pasó este auto los dichos indios tenían hechas unas rayas en el suelo y puestos mayçes y piedras en car[r]erilla en cuya usança dizen es su quenta (cited in Curatola and de la Puente 2013:233).

intended not so much to perform the calculation operations, but rather to legitimize the accounting practices and indigenous claims against the Spanish authorities (Curatola and de la Puente 2013:193, 195; Urton 1998:419). The open courtyard offered the necessary light for carrying out long hours of counting, until the darkness of night forced the operations to continue the next day (Curatola and de la Puente 2013:218, 237).

Like the testimony of Sacaca, that of Atun-sora reports the simultaneous use of *kipus* and counting elements handled on the floor “because one put it on the *kipu* and this witness [made the count] with corns on the floor” (cited in Curatola and de la Puente 2013:207; translation of the authors).²⁰

DISCOVERIES IN HUACONES-VILCAHUASI, LOWER CAÑETE VALLEY

The archaeological complex of Huacones (Figure 2), identified as the site of Vilcahuasi mentioned in colonial documents (Larrabure and Unanue 1935 [1893]:270–271), is in the District of San Luis, Province of Cañete, Department of Lima. Situated on the right bank of the lower valley of the Cañete River, one kilometer away from the beach line, it has an approximate extension of sixty hectares. Huacones-Vilcahuasi was associated with the longitudinal coastal road of the Inca *Qhapaq Ñan* system, on a segment that has disappeared, but which must have connected sites including Cerro Azul-El Huarco, Huacones-Vilcahuasi, and Herbay Bajo in Cañete territory.

As we have already pointed out, Huacones is one of the most important settlements in the site hierarchy of the lower Cañete Valley (Marcone and Areche 2015:56). It is the largest architectural complex in this part of the valley, and the possible capital or center of political-

administrative power of the Kingdom of Guarco (Campos 2007:60; Engel 2010:170; Hyslop 1984:89; Williams and Merino 2006 [1974]:97). However, until recently, the site had not been systematically excavated as part of an archaeological investigation.

The complex is formed by ten sectors. Previous studies indicated that occupation may have started during the Early Intermediate Period in the sectors located in the southwest of the settlement, while the late occupation (Late Intermediate Period and Late Horizon) is concentrated in the central part. Over time, the site has been notoriously affected by the use of some mounds as quarries for construction material, the expansion of cultivation fields, and recent invasions of settlers.

At the end of 2017, the *Qhapaq Ñan* Project of the Peruvian Ministry of Culture carried out a restricted intervention in Huacones-Vilcahuasi with the objective of collecting and evaluating Inca and local evidence in one of the central sectors of the site, Sector F (Figure 3), which is 400 meters long by 340 meters wide. Here it was possible to record the existence of two architectural components, the South Complex and the North Complex, separated by a large area on a different level.

Discovery of a yupana on the floor and kipus

Excavations made in Unit 1 of the South Complex, a 5.00 meter by 4.00 meter unit placed in the southwest corner of the large courtyard of the architectural complex, revealed a *yupana* on the floor, an accounting device delineated on the surface of a platform that is 2.10 meters by 2.00 meter along its sides and 22 centimeters high (Figure 4). This platform was attached to a large adobe brick wall (EA 1) that delimits this public space and to a large rectangular structure with elite residential areas and large storerooms, these latter adjoining the disturbed zone.

²⁰ . . . porque el uno ponya en el quipo y este testigo [realizaba la cuenta] con mayzes en el suelo.

A series of holes in the platform was observed, grouped into two sets, located both north and south of the disturbed area and designated with the letters A and B. Each set has two parts, top and bottom, each divided by incised lines forming five rows of holes respectively (Figure 5). The upper and lower parts of sets A and B have rows of eight holes. Although the lower part of Set B is more deteriorated, there are still hole imprints, which allow us to verify their number. It is probable that the holes were made with circular objects of different sizes when the mud was still fresh, as their diameter varies between four and seven centimeters. At the west end of the platform, where it is attached to the great wall of adobe bricks, we observe the remains of the original level of the *yupana* and its progressive sinking. Finally, towards the northeast corner of the platform, a quadrangular imprint of forty centimeters per side was recorded. When we excavated it, we recovered botanical remains and fragments of non-diagnostic ceramics. It is possible that this imprint may have been an original part of the *yupana*. In general, Excavation Unit 1 (UE-01) allowed us to recognize the existence of this accounting device, as well as at least three remodelings of floors in the patio of the South Complex.

It is important to mention that the *yupana* on the floor of Huacones-Vilcahuasi has great formal similarity with some blocks of stone recovered in the sanctuary of Pachacamac, in the Lurín Valley, which also present alignments of cavities. These artifacts have been linked to prehispanic accounting practices developed for the storage of resources (Eeckhout 2012:220).

During the same field season, a surface collection of materials made in the North Complex of the site, included eleven *kipus* that, although they were recovered rolled, were well preserved (Figure 6). This find occurred in the southeast corner of Patio 2 of this complex (Figure 4). All the *kipus* were made of cotton fibers, and some had red and blue knots. It should be noted that the North Complex also has large storerooms associated with public spaces and platforms with restricted access. Table 3 shows the technical details of the *kipus* recovered on the site.

Khipu	Material	Color				Number of pendants cords	Number of subsidiary cords	Number of Knots	Number of Top Cords	Number of Knots in Top Cords
		Primary cord	Pendant Cords	Subsidiary cords	Top cord					
Khipu 1	Cotton	Cream and light brown	4 cream	2 light brown, 1 dark brown	–	4	3	9	–	–
Khipu 2	Cotton	Cream and light brown	5 cream	–	–	5	–	5	–	–
Khipu 3	Cotton	Cream	7 cream	–	1 cream	7	–	4	1	1
Khipu 4	Cotton	Cream and light brown	6 cream, 1 light brown	7 cream with red pigments	1 cream	7	7	14	1	3
Khipu 5	Cotton	Cream	5 cream, 2 with red pigments	2 cream, 1 with red pigment	1 cream	5	2	16	1	2
Khipu 6	Cotton	Cream	4 cream, 1 blue, 1 light brown	4 dark brown	2 cream, 1 with red pigment	6	4	22	2	7
Khipu 7	Cotton	Light brown	4 light brown	6 cream	–	4	6	18	–	–
Khipu 8	Cotton	Cream	9 cream	3 cream	–	9	3	24	–	–
Khipu 9	Cotton	Cream	9 light brown	2 light brown, 1 with red pigment	–	9	2	11	–	–
Khipu 10	Cotton	Cream	5 cream	4 cream, 1 with red pigment	1 cream	5	4	11	1	–
Khipu 11	Cotton	Cream	2 cream	–	–	2	–	–	–	–

Table 3. Technical characteristics of khipus found in Huacones-Vilcahuasi

The presence of one *yupana* and *khipus* in the North and South complexes of Sector F of Huacones-Vilcahuasi, in both cases close to large storerooms, indicates the administrative character of this area of the settlement and the presence of specialists engaged in recording, perhaps received as part of local taxation during the Inca occupation of the lower Cañete Valley.

Chili Pepper Storage

Another important feature of the site is a storeroom containing two species of chili peppers: *Capsicum baccatum* (yellow chili) and *Capsicum chinense* (*limo* and *panca*). The storage facility was excavated within the main platform at the west end of the North Complex (Figure 7). This platform was built with *tapia* (rammed earth) and has a rectangular plan, 75 meters by 38 meters. A wall of *tapia* encloses the complex, with restricted access near its northwest corner.

The main platform is composed of two large structures, Architectural Units 1 and 2. The first is located to the north of this complex and consists rectangular rooms of apparent residential use. The second, on the other hand, is

located to the south of the main platform and is made up of three large rooms and a set of storerooms built at the south end of the architectural unit.

The storeroom of chili peppers was found in Excavation Unit 7 (UE-07), inside Architectural Unit 1 of the main platform (Figure 4). Excavation allowed us to identify a rectangular plastered room built with *tapia*. Its dimensions are 3.40 meters by 2.60 meters. The length is estimated because, due to fieldwork deadlines, we could not excavate the whole structure. The room extends northward and only the head of its eastern wall revealed a row of adobe bricks.

From the floor of the storeroom, we were able to recover abundant botanical material. Analysis showed a predominance of chili peppers (Figure 8), corresponding to 96 percent of the sample. Other botanical remains such as those of maize, fruits, and legumes represent, respectively, 2.36 percent, 1.41 percent and 0.14 percent of the total recovered. Among the different varieties of chili peppers (Figure 8), the species *C. chinense* is present in the highest

proportion (67 percent), followed by *C. baccatum* (28 percent) and by remains that, due to their state of degradation, have not been identified to species and appear registered as *Capsicum* sp. (5 percent).

Thanks to the botanical analysis, we can argue that the excavated room in Architectural Unit 1, during its last period of use (during the Late Horizon), was a private store of chili peppers. The elites who inhabited the residential areas on the main platform would have controlled the distribution of this resource. The good state of conservation of the chili peppers is notable and probably occurred because the collapse of the walls of this storeroom covered its contents and contributed to the slow deterioration of these remains.

PREHISPANIC YUPANAS ON THE FLOOR REPORTED FROM THE CENTRAL ANDES

Discoveries of *yupanas* comparable to that found in Huacones-Vilcahuasi have been reported since the 1990s from at least four other settlements occupied by the Incas: Farfán, in the Jequetepeque Valley, Department of La Libertad; Manchán, in the coastal zone of the Casma Valley, Department of Ancash; Incahuasi of Lunahuaná, in the middle Cañete Valley, Department of Lima; and, finally, in the Torata Valley, in the highlands of the Department of Moquegua.

Farfán, a Chimu administrative center re-occupied by the Incas, continued to be used for its previous functions and was turned into the largest storage center of the Peruvian North Coast. Carol Mackey, excavator of Farfán, found a *yupana* on the floor inside Room 2 of Compound B, an elite residence in Complex VI. It was a Chimu storeroom transformed by the Incas into a residential unit (Mackey 2003:328, 2010:231). We have only a brief description of this *yupana*:

In Room 2, we found a unique feature that closely resembles an Inca *yupana*, an aid

used in counting large numbers of items. . . The *yupana* consists of small squares incised into the plaster floor on the east side of the room. These squares were arranged in a pattern of 17 rows and 23 columns for a total of 391 squares. . . . In the center of each square was a round depression that could have held a small object such as a stone or a kernel of maize, which was used to tally the total number of items. The total obtained from a *yupana* was generally knotted onto a *kipu* string to record the total number of a given object (Mackey 2010:231–232).

The squares described, with their central circular depressions, correspond perfectly to a set of incised designs constituting a *yupana* on a floor at Manchán (Figure 9), another important Chimu provincial center occupied by the Incas. In Sector A, close to the Pan-American Highway North, a low earthen platform (6 centimeters high, 1.65 meters long, by 1.00 meters wide) was discovered, on whose surface were traced “crossed lines forming a grid in a square shape”. This grid is formed by squares of approximately 14 centimeters per side, forming “13 parallel rows one next to the other that go from east to west, of which 12 show in the center a hole of 0.03 meters in diameter”. A row without markings, located in the center of the design, divided it symmetrically into two groups of six rows with holes (Horna 2016:4237, photo 10, translation by the authors; see also Samán and Horna 2018:63–64, figure 42).

A few centimeters north of this *yupana* three floor segments (“panels”) were encountered that were likewise marked with grids, but without central depressions. The designs consisted of “incised crossed lines (forming a grid), made with cords when the surface of the floor was still damp” (Horna 2016:4229, photos 22–24, translation by the authors; see also Montalvo and Touzet 2018:figure 26 and Samán and Horna

2018: figure 43).²¹ These grids have two variants: they could be quadrangular in shape (about 18 centimeters per side) or rectangular (70 by 20 centimeters).

The discovery of this type of accounting facility in Farfán and Manchán is not unexpected. Both sites have been classified as the only secondary centers within different hierarchies of Chimu settlements, because of their size and because they have architectural components that are comparable to those of the Chimu capital of Chan Chan. These components include patios with sidewalks and ramps, as well as *audiencias* and storerooms (Mackey 1987:124–125, table 1). Moreover, as suggested by the presence of the latter two components, it is probable that one of the main functions of Chimu provincial centers was, even under Inca control, the extraction and accumulation of resources (Cutright 2009:61), although up to now no evidence has been discovered of any accounting devices of the *yupana* type during their Chimu occupation.

At Incahuasi of Lunahuaná, identified as the largest Inca storage center in the imperial expansion to the south (Urton and Chu 2015: 512), the discovery of floor *yupanas* with cross-hatched designs similar to those found in the “panels” of Manchán have been reported, although with a different grid distribution. These have been found in three sectors: in two rectangular rooms (U.A. 7 and U.A. 8) of Subsector 1 of the Qolqawasi storage complex (Sector A), in Subsector 1 of Sector C, and in the main square (Sector E) of the settlement (Chu 2015:104; Urton and Chu 2015:524).

In the case of the long rectangular rooms of the Qolqawasi, identified as drying/classification areas for the crops stored nearby (chili peppers,

peanuts, and black beans), approximately thirty reticulated panels three squares wide by thirty-nine squares long (with each square measuring twenty-three centimeters per side) were arranged in parallel along each structure. The designs were made by impressing strings on the wet mud of the floor (Urton and Chu 2015: 524).

The *yupana* drawn on the floor of the plaza, consists of four cross-hatched stripes each one meter wide, integrated by low relief grids, fifteen centimeters per side. These stripes, arranged parallel to the *ushnu* of the site, are separated by spaces of fifty centimeters in which were drawn smaller low-relief grids, seven centimeters per side (Chu 2015:104).

Although Gary Urton and Alejandro Chu have pointed out that the reticulated panels of the Qolqawasi sector would have served to standardize accounting units, especially small-scale agricultural products (beans, chili peppers, peanuts, etc.) that would be stored (Urton and Chu 2015:524–526), we are inclined to identify this type of facility as accounting devices, agreeing with Carol Mackey’s proposal (2003:330). It would be the “stripes on the ground” which, according to the 1580 testimony of the scribe Ayala, were used to carry out calculations with maize and stones (Curatola and de la Puente 2013:233).

It is appropriate to remember that the Inca state had a system of measures of volume based on the different types of containers used for the transportation and delivery of the taxed items (Arellano 2013:125, 132; Rostworowski 1990:

²¹ Líneas incisas entrecruzadas (formando un reticulado), las mismas que han sido elaboradas con soguillas estando la superficie del piso aún húmeda (Horna 2016:4229, photos 22–24; Samán and Horna 2018: figure 43).

61–62),²² which facilitated the accounting of the collected goods.

In the colonial documentation generated from the decoding of *kipus*, these units of measurement are usually mentioned with their Spanish denomination and the volumes converted to bushels (Murra 2002 [1975]:254; Pärssinen and Kiviharju 2004:273–277). In some transcriptions of *kipus* and indigenous declarations from the sixteenth and seventeenth centuries, however, we can also find references to indigenous units of measure applied to specific products: *guayacas*, *pacos*, and *malta* “sacks” of different dimensions employed for the delivery of coca and chili pepper; *yzangas* or *runcus* “baskets” used as well, to tax these products and fruits; *pocchas* or *raquis* “jars of clay”, equivalent to half bushels, in which beans and maize were placed etc. (Julien 2001:255, 257; Medelius 2011b:140; Murra 1983:83–88, 1991:190, 213; Ortiz de Zúñiga 1967, 1972 [1562], I:26; see also Espinoza 1987, I:129; Rostworowski 1990:62).

In other cases, the review of Quechua and Aymara colonial dictionaries makes it possible to specify Andean equivalences of the categories that, once translated into Spanish, were recorded in the archival documents: the “charges” applied to potato, quinoa, salt, and *charqui* would pertain to the Quechua word *vinay* (González Holguín 1608, I:353) or to the Aymara word *ccumu* (Bertonio 1612, II:62); while *petacas* and *petaquillas* (plant fiber boxes) were used in the deliveries of “dried birds turned into *charqui*”, *amucca* (dried shrimps), *chuchi* or *chichi* (the aquatic insect *Lachlania* sp.), and dried

guabas (*Inga feuillei*) corresponding to the Aymara *phutti* and *mocoti* (*ibid.*:224, 282).

Specifically for “costales” (sacks), we have a valuable testimony from the sixteenth century that demonstrates the strict control of measures during Inca times. It is an ordinance issued by the Cabildo of the city of Huamanga (Ayacucho) on 12 May 1543:

. . . about the coca that until now has been sold and is sold, the sacks are very small and not like they used to be given to the Inca to the detriment of the said town and every day they are getting smaller . . . it is commanded and ordered that from today forward all the sacks that are sold be of the same kind caciques used in the time of Guaynacaba (Rivera 1966:126; translation by the authors).²³

The use of sacks as volume measures for storage and exchange has been maintained in some Andean communities. In the Cusco province of Paucartambo, for example, Óscar Núñez del Prado reported in the middle of the last century the use of “sacos patrones” (pattern sacks) by the *Arariwas* (people responsible for guarding the products of the haciendas) to count, record with *kipus*, and store the crops of potatoes and ears of maize, the processed *chuño* and *moraya* (types of freeze dried potatoes), and the grains of maize. In different sacks they marked the “units of reception” with colored threads, at the part to which they had to be filled with *chuño* and *moraya* or corn. These marked sacks and the whole system of establishing the measurements received the name of

²² Some archaeological finds from inside Inca storerooms confirm the use of transportable containers for the storage of various products: sacks for chili peppers (Obregón 2014:139), clay jars for maize grains (Morris and Thompson 1985:102, plate 36) and reed boxes (*petacas*) for feather ornaments (Trimborn 1988:148, figure 58).

²³ . . . por quanto la coca que hasta agora se ha vendido e vende son los costales muy chicos e no como se solian dar al Inga en perjuicio de la dicha villa e que cada dia los van achicando mas . . . mandaron e ordenaron que de[sde] oy mas todos los costales que se vendieren sean de marca segun que los caciques los hazian en tiempo de Guaynacaba (Rivera 1966:126).

chimpuy (Núñez del Prado 2005 [1950]:181–182). In the Yucay Valley, in a similar way, Fioravanti-Molinié (1975:46–47) documented the establishment of equivalences between the quantities of maize contained in ceramic vessels (*raquis*) and in wool sacks with measuring marks denominated *chimpu* (Núñez del Prado 2005 [1950]:181–182).²⁴

Finally, we have the case of the site of Sabaya, in the Torata Valley, where excavations carried out by Peter Bürgi in 1990 and 1991 revealed another *yupana* on a floor (Figure 10). This was impressed in a mud floor below Structure 1, an elongated construction of fifty-five meters by fourteen meters wide (Bürgi 1993: 216–218).²⁵

The reticulated designs registered in Sabaya have square and rectangular grids that are comparable to those of the “panels” at Manchán. The fact that this *yupana* follows a different orientation to that of the elongated struc-

ture built on it (Bürgi 1993:figure 58), opens the possibility that this enclosure was erected in colonial times. In any case, it is important to emphasize that Sabaya is considered to be the provincial Inca center of the region, and it is connected by the *Qhapaq Ñan*, to the storage complex of Camata Tambo, just one kilometer away (Chacaltana 2015:53).

The totality of this evidence and the spatial distribution of *yupanas* allows us to postulate the existence of at least three types of *yupanas* constructed on floors, linked to three different cultural traditions:

On the North Coast, associated with the Inca occupation of Chimu provincial centers, we find *yupanas* with cross-linked designs with central circular depressions.

On the Central and South Central Coast, associated with the Ychsma and Guarco provincial centers, we find *yupanas* with circular cavity alignments.

Along the coast, associated with provincial centers with a strong Inca presence, we find *yupanas* with cross-linked designs and with square and rectangular plain quadrilaterals. These may be associated with other types of *yupanas*, as is the case in Manchán.

With regard to the first case, the ideas suggested by John Topic (2003:245, 2013: 36–37) on the progressive development of a bureaucracy in the Chimu state with its capital at Chan Chan, are very suggestive. This development would have led to the transition from direct control of storerooms by *mayordomos* who occupied *audiencias* directly associated with the rooms, to control of information about the stored goods by bureaucrats in *audiencias* physically distant from the storage areas.

This bureaucratic organization, following Topic (2003:251, 2013:37), could have ac-

²⁴ The *chimpu* sacks were also employed until a few decades ago by the shepherds of the province of Caylloma, in Arequipa, for barter (Arrosquipa 2014:265), and by the farmers of the Bolivian community of Huayculí, southwest of Cochabamba, for exchanging and measuring their potato harvests (Hatch 1983:79). Apparently, *chimpu* sacks represent a measurement system introduced during Inca times, because in the Aymara and Quechua dictionaries of the early seventeenth century references were included: s.v. *chimpu* “mark of wool, string, or tassel of colors” (González Holguín 1608, I: 102); *chimpu* “mark of the measure that something has”; *chimputha* “to indicate the measure with some string, or with something else” (Bertonio 1612, II:82). In the town of Huayucachi, in Huancayo, even today the *winachiku* (from Quechua *vinay* “to load” and *vinani* “keeping in a sack, making up a load”) is woven. This is a sack that has markings of different colored threads on one of its sides; these marks allow one to measure different products (meat, *charqui*, and cheese) and to establish equivalencies with other exchange goods (Carhuallanqui 1998:95).

²⁵ We thank Sofía Chacaltana Cortez for information on this discovery (personal communication, 16 January 2018).

counted for the goods coming from a distance that were collected in the storerooms; using some of the architectural features of the *audiencias* (bins, troughs, and niches) and small stones or grains of corn to record or to perform calculations.²⁶

With the start of Inca administration of the Peruvian North Coast, Chimú accounting practices would probably have had to have been adapted to the new forms of recording and accountability imposed from Cusco.²⁷ The *audiencias*, which in Chan Chan were operating in a similar way to the *kipus* (Topic 2003:251), would have gradually lost their functions, which were being assumed by two new devices: the *kipu* and the *yupana*. Although everything seems to indicate that the Chimú state did not

employ a system of recording with knotted strings, some colonial sources (Cabildo of Trujillo 1969 [1598–1604]:13, 19) indicate that this was introduced to its indigenous population under the Inca regime.²⁸

Unlike what occurred on the North Coast, where the Inca administration required the construction of *yupanas* on the floor consisting of cross-linked designs with central circular depressions, populations on the Central and South Central Coasts apparently continued to use a local calculation system.

In presenting the findings from Huacones-Vilcahuasi, we have already called attention to the great similarity between the *yupana* found there on the floor and certain stone blocks or boards from the political, administrative, and ceremonial center of the Yschma kingdom, the sanctuary of Pachacamac. One of these blocks, found in 2008 in the exterior of the Pyramid with Ramp 11 has two parallel alignments of ten holes each (Eeckhout 2012: figure 11), and has been compared by Peter Eeckhout with the *yupanas* described by some modern researchers. Insightfully, Eeckhout has drawn attention to the correspondence between the number of cavities of the block and the number of storerooms that comprise Building 8, a storage complex where several *kipus* were found. In his view, this coincidence is due to similar logical structures associated with a decimal number system (*ibid.*:220).

On the other hand, it is indicative that, in Pachacamac, the boards with these characteristics began to be used for accounting from at least the early stages of the Late Intermediate Period. This is confirmed by the discovery of a

²⁶ As we have already pointed out (Note 7), on the Peruvian North Coast, the earliest mention of the use of grains of maize as an accounting tool is in the 1540 *visita* to Jayanca (Espinoza 1975:269). In the 1930's, Rafael Larco Hoyle reported similar practices (manipulating not only maize, but also legume seeds [*tarwi* {*Lupinus mutabilis*}, beans, and lima beans]) among the elders of Paiján and other indigenous settlements in the Chicama Valley (Larco 2001 [1938]:163).

The analysis of some numerical classifiers recorded in the *Arte de la Lengua Yunga* (1644) of Fernando de la Carrera, confirms the old use of accounting stones in this region. The vocative *na.pong*, used to refer to ten ("if you count men, horses, goats, canes, and anything other than currency, fruit, or days"), for example, is formed by the roots *na* "one" and *pong* "stone" (Villarreal 1921:37, 121, 124; see also Salas 2011:21), so a stone could take the place of ten units when people, animals, and large objects were counted (Bellamy 2018:15, 17, table 2).

²⁷ We know that, like the Incas, the Mochica and Quingnam speakers resident in Chimú territory used decimal numbering and accounting systems before being incorporated into Tawantinsuyu (Quilter *et al.* 2010:362–364; Salas 2008:147; Solís 2015:11; Villarreal 1921:112). This would have originated in the practice of counting using the fingers of both hands (Salas 2011:18–19). It is possible that this management of decimal-based systems facilitated the adoption of new modalities of calculation on the Peruvian North Coast.

²⁸ As suggested by Bellamy (2018:17), it is possible that the Mochica numerical classifier *ssop* "rope" used to refer to a dozen fruits, coins, or units of time may have originated in the use of *kipus*, implying its late incorporation into that language.

specimen, notoriously worn, forming part of the “cercadura” enclosing a vessel from that time, found under the Pilgrims’ Plaza (Shimada *et al.* 2004: figure 16).

In comparing this evidence with that from the Cañete Valley, it is clear that in the possible political center of the Guarco Kingdom, located in the lower valley (Huacones-Vilcahuasi), the deliveries, counts, and records of tribute took place in the internal courtyards of residential-administrative complexes equipped with storage areas, comparable to the Ychsma pyramids with ramp. In the Inca provincial center of the middle valley (Incahuasi of Lunahuaná) the counting and registration of deliveries was carried out in two separate spaces: in the main square of the settlement and in sectors reserved for storage (Qolqawasi).

Following John Topic’s approach, it is possible to suggest that in Huacones-Vilcahuasi the Guarco elites employed officials directly involved with the receipt, accounting, registration, and storage of tribute goods, *mayordomos* who interacted face-to-face with local rulers and employed traditional recording and accounting techniques (floor *yupanas* of the second type; Figure 11).

In contrast, at Incahuasi of Lunahuaná, the Inca elites may have maintained two types of officials: (1) Bureaucrats responsible for the reception, accounting, and redistribution of the resources rendered to the state, whose tasks were performed between the administrative sector and the main plaza of the settlement, where they interacted personally with the provincial representative of the Inca and other state officials of the highest rank (some perhaps in transit); and (2) *mayordomos* directly responsible for the accounting, registration, and storage of the resources rendered to the state, who had as their area of activity the storage sectors themselves. Both categories of officials employed

yupanas of the third type (plain cross-hatched) similar to those reported for Manchán and Sabaya, a modality directly linked to the Inca state (Barraza 2016:104–105), represented both on colonial *queros* from Cusco, and in a colonial source from the southern Andes, the *Relación de antigüedades* by the Indian chronicler Juan de Santa Cruz Pachacuti (1992 [c. 1613]: 203), where the design presented is called *collcapata*, that is, storage plaza or field.

THE ROLE OF CHILI PEPPERS IN PRE-HISPANIC ECONOMY AND RITUALS

As we have already indicated, in the store-room excavated at Huacones-Vilcahuasi, important quantities of two species of chili pepper were recovered: *Capsicum baccatum* (yellow chili) and *Capsicum chinense* (the variety called *limo* and *panca*). These finds lead us to think about the role this crop could have filled in the economy and rituals of the Guarco.

In this regard, we must indicate that similar finds have been made in other settlements of the Central and South Central Peruvian Coasts during the Inca occupation. In the sanctuary of Pachacamac, in the Lurín Valley, seeds of *Capsicum chinense* were discovered inside a vessel close to the previously mentioned Building 8, a storage complex in which Peter Eeckhout and his team recovered *kipus* (Eeckhout *et al.* 2015:2). Remains of *Capsicum* sp. were found in the quadrangular storerooms of Building 8 (Eeckhout and Luján 2013:18–19) and in the rectangular storerooms of the Pyramid with Ramp 2. In the latter case, the chili peppers were covered with clean river sand (Eeckhout 2004b:431; Ramos 2011:106).

Similarly, in Panquilma, another settlement in the Lurín Valley, Enrique Lopez-Hurtado and his team discovered traces of chili pepper (*Capsicum* sp.) in very good condition placed under a layer of fine river sand within a storeroom.

This room was on the second platform of the Pyramid with Ramp 3 at the site (López-Hurta-do *et al.* 2012:24).

In the lower Cañete Valley, at the site of Cerro Azul-El Huarco, Joyce Marcus recovered peduncles and seeds of chili peppers (possibly *Capsicum baccatum*) in a midden associated with the rooms and patios of the elite complex called Structure D (Marcus 1987:61, figure 41c-d). Remains of the same crop were also found in the southwest *canchón* (plaza) of the complex, a space where the unloading of goods transported by llamas would have taken place (Marcus 2008: 95). Similar finds have occurred in the middle valley, where remains of *Capsicum baccatum* corresponding to seeds, peduncles, exocarps, and whole fruits have been discovered in the storerooms of several sites with Inca occupation including Pacan 1, Peña de la Cruz de San Juan (Colcas of Lunahuaná), Cruz Blanca, and Cerro Tinajero (Díaz 2015a:21, 23, 32, 34, 49, 2015b: 137–138; Ramírez 2013:274, 279–281). In the storage sector called Qolqawasi of the Incahuasi complex in Lunahuaná, traces of *Capsicum* sp. have also been recovered, associated with *kipus* (Urton and Chu 2015:512, 519–520) and fruits of *Capsicum annuum* found inside sacks (Obregón 2014:163, photo 21).²⁹

Although it has been pointed out that in the prehispanic Andes the consumption of chili peppers was massive and it was “spread everywhere and among all the social classes” (Espinoza 1987, II:101, 107), the recurrent association of food waste and storage facilities with elite residential complexes, not only in our study area, but also in other regions of Tawantinsuyu (e.g., Costin and Earle 1989:696; Lennstrom 1992:7), suggests that, at least during the Late

Horizon, control of chili pepper redistribution could have fallen to these privileged groups, at either the state or local level.

Colonial sources confirm the great value that chili peppers had in the power arrangements of prehispanic societies. At the state level, the Incas had specialized farm workers for the cultivation of this plant, both on the coast and in the highlands. They received the name of *uchu camayoc* (Falcón 1867 [1567]:466, 468). In addition to these specialists, who worked permanently in the lands of the Inca and of the sun as *yanaconas* (permanent retainers), the diverse ethnic groups who constituted Tawantinsuyu had to assign to this task groups of *mitmas* (rotational workers) who would provide labor services.³⁰ The Chupachu of Huánuco, for example, provided forty farm workers to the Inca each year for the fields of chili peppers whose produce would be taken to Cusco (Ortiz de Zúñiga 1967, 1972 [1562], I:306). About this labor obligation, the Inca Garcilaso wrote:

Likewise the principal tribute was to work and improve the lands of Sun and Inca and take the fruits—whatever they were—and enclose them in their *orones* [baskets] and put them in the royal store-

²⁹ Some *kipus* decoded in colonial times, from the Lima regions of Canta and Chillón, confirm the use of sacks and baskets made with vegetable fibers for the delivery of tribute in the form of chili peppers (Murra 1983:83, 87).

³⁰ *Mitmas* of this kind coming from, among other places, the valleys of Mala, Coayllo, Chinchu, Pisco, and Ica were moved during the governments of Túpac Inca Yupanqui and Huayna Capac to the Pachachaca Valley, in the Peruvian province of Abancay, to grow lucumas, pacays, cotton, corn, and chili peppers of the variety called *chinchu*, crops that were destined for the consumption of the imperial armies (Espinoza 1973:232, 241–242). It is possible that this kind of chili pepper, described by Inca Garcilaso (2005 [1609], II 521) as “tiny and rounded, no more or less than a cherry . . . [and that] burns much more than the others with no comparison” would correspond to small, round, wild chili peppers that grow today in the province of Andahuaylas, Apurímac and is called *mucuru uchu* (*Capsicum tovarii*). *Mitmas* from Ica were transferred, likewise, by Inca Huayna Capac as *yanaconas*, to the Bolivian region of Cochabamba to grow chilies in the fields of the ruler (Espinoza 1993:48–49, 51).

houses that were in every town for gathering together the fruit (and *one of the main fruits was uchu, that Spaniards call “chili”* and by another name “pepper”). . . . (Garcilaso 2005 [1609], I:261; translation and emphasis by the authors).³¹

The Jesuit Bernabé Cobo (1956–1964 [1653], I:172), noted in the seventeenth century that, after maize, chili pepper was the crop that had the highest esteem among the Incas. This would explain why it was frequently cultivated in the private lands of the rulers from Cusco, as it was in the Sacred Valley of the Incas and in the Royal hacienda of Huayna Capac in Yucay, Department of Cusco (Covey 2006:226).

A similar situation occurred at the level of the local lords. Don Hernando Anicama “the old man”, *curaca* of the *parcialidad* Lurin Ica, for example, even in the second half of the sixteenth century, had a chili pepper farm in the desert of Xunxulla, Ica (Zevallos 1993–1995: 147). The main *curaca* of the *guaranga* of Guancayo, in the Chillón Valley, had a “large *chacra* [field] of chili peppers” which his subjects cultivated (Espinoza 1963:64). When there was no adequate land for cultivation, another way to acquire important quantities of chili peppers was through tribute. Such was the case of the *curaca* of Huarochiri Don Antonio Ninavilca, principal lord of the *parcialidad* Lurin Yauyos, who periodically received chili peppers, ears of corn, and coca leaves from Vilcapoma, *curaca* of the village of Chaclla, in the Sierra de Lima (Rostworowski 1967–1968:32).

³¹ Es así que el principal tributo era el labrar y beneficiar las tierras del Sol y del Inca y coger los frutos—cualesquiera que fuesen—y encerrarlos en sus orones y ponerlos en los pósitos reales que había en cada pueblo para recoger los frutos (y uno de los principales frutos era el *uchu*, que los españoles llaman “ají” y por otro nombre “pimiento”). . . . (Garcilaso 2005 [1609], I: 261).

Scholars agree that this assessment was due to the properties of chili as a condiment, which seasoned food, making it more tasty (Bray 2003: 6–7; Espinoza 1987, II:100) and, even more importantly, due to its great acceptance as an exchange commodity or “currency-merchandise” (Chiou *et al.* 2014:197; Espinoza 1987, II:98, 108). Chili pepper was also an important product in the preparation of food offerings used in rituals (Capparelli 2015:78, 80), perhaps because of its symbolic links with the underworld.

Concerning the role of chili peppers as exchange goods, some provincial ethnohistorical sources from the sixteenth and seventeenth centuries mentioned their use in “vertical” (*sensu* Murra) exchange of products between neighboring communities. In Huánuco, the Chupaychus and other neighboring groups exchanged chili peppers, coca, and maize for camelid fiber, salt, river fish, and *charqui* that were provided by groups settled in other ecological niches (Ortiz de Zúñiga 1967, 1972 [1562], I:58, 179; II:50). Closer to our study area, in the Chíncha Valley, the *curaca* and inhabitants of the *parcialidad* of Aya “had their chili fields and [*chacras* of] legumes with which they managed and exchanged with the Indians of the highlands and other Indians from this valley” (Archivo General de la Nación, Perú [AGN] 1614:folio 35v[34v]).

These exchanges could become really vital to the livelihood of some groups, as a well-documented case on the Peruvian North Coast shows. During a lawsuit with the town of Mochumí over the control of the water of the Quebrada Canchachalá, the principal lord of Jayanca, Pacora, and Mórrope, Don Geronimo Puyconsoli, declared in 1654:

. . . the greatest support of our claim, is the fact that *the Canchachala ravine was bought by our ancestors* from the cacique of Pena-

chi many years before the Spaniards entered this kingdom, *with gifts of salt, aji, and items of clothing*, and this tribute was continued until the first *visita* made by Dr. Cuenca [Gregorio González de Cuenca, 1566]. (cited in Netherly 1977:267–268; translation and emphasis by the authors).³²

With regard to the ritual value of chili peppers, the close association established by the Andean populations between this crop and the dead has been manifested throughout the centuries in different aspects of culture, including cuisine. Chili peppers and salt have traditionally been considered the favorite foods of the dead due to their desiccant properties, constituting, at the same time, foods forbidden during fasting before making any contact with the dead, perhaps as a preventive measure against possible contagion of the “burning dehydration” prevailing in the afterlife (Gose 2001 [1994]:141).

The preparation and consumption of “spicy” foods during funerals has been recorded in the Central Andes from the seventeenth century to the present. In the Quechua manuscript of Huarochiri (Taylor 1999 [c. 1608]), for example, it is mentioned that in that part of the Sierra de Lima, during the celebration of the Feast of All Saints, it was a tradition to prepare food for the deceased, consisting of potatoes and *charqui* “very well-seasoned with chili” (Taylor 1999:371). Additionally, in the village of San Lorenzo de Quinti in Huarochiri, it was usual to prepare a meal for the deceased composed of peppered *mote* (hominy), as was observed during a funeral service carried out in 1660. Once distributed in large gourds, bags, and baskets of vegetable fiber (*shicras*), the food was placed

near the head of the deceased (Valcárcel 1985, III:114).

The importance that the consumption of chili peppers had during these events was such that the chronicler Juan de Betanzos (2004 [1551]:222) includes this fruit as one of the essential elements for performing the Inca ritual of *Purucaya*, a ceremony that took place sometime after the death of a member of the Cusco nobility, marking the end of mourning and the beginning of the cult of his mummy.³³

³³ Ethnographic studies carried out in various localities in the Andes show that this association between chili peppers and the dead never disappeared. There are recurrent mentions of the consumption of spicy meals both during funerals, and near the corpses, as during the celebration of All Saints’ Day (November 1), during which the dead visit the living (Carter 1968:242; Paredes 1976(1920):307; Sillar 2000:120, 123). Among the Aymara speakers of Bolivia, this act of consuming meals seasoned with a lot of chili during funerals is called *huaykca urasa* or “the hour of chili” (Paredes 1976 [1920]:307). Similarly, in the town of Santiago de Pumpuri, Potosi, in the province of Chayanta, the Quechua term *uchu* (chili pepper) is used to refer the day dedicated to the celebration of All Saints, during which hot dishes destined for the dead are cooked (Sillar 2000:120, 2004:168).

These dishes, prepared to be enjoyed by the dead and their mourners, receive different names according to the region where they are prepared:

The miners of Oruro, Bolivia, prepare the *fidu uchu* or chili noodles and the *ajis uchu* (Aguilar 1998:106, 119).

In the Ecuadorian town of Calderón, outside Quito, the *uchukutu [uchukuta]* is prepared. This consists of a mixture of peas, *mote*, and potatoes accompanied by stewed meat (guinea pig, chicken, or pork) with a sauce of peanut, achiote, and a lot of chili (Moya 1981:68, 70).

In the town of Salasaca, south of Ambato, Ecuador, the games performed during funerals are often accompanied by the consumption of a soup made of corn flour that is called *uchu* (chili pepper). This dish, however, has different names, which vary according to the context in which is eaten. Thus, if consumption occurs during the performance of the game called *huayru*, its name is *huayruchu*. If

³² Lo que mas fuerza trae a nuestro derecho, es porque la quebrada de Canchachalá la compraron nuestros antepasados del casique de Penachí muchos años antes que los españoles entraron [a] este reino, con presente[s] de sal, ají y piezas de ropa y este tributo observaron hasta la primera visita que hizo el doctor Quenca.

The information presented in this paper allows us to infer the use that the Guarco elites would have had for the chili peppers stored in Huacones-Vilcahuasi. The fact that the excavated storeroom was located in an area close to a sector with the residential architectural characteristics of the main platform in the North Complex, leads us to suspect that these resources could have been destined for eating and ritual consumption by powerful groups that lived there and were, perhaps, used to sustain the networks of vertical exchange that local elites maintained with neighboring highland groups.

DISCUSSION

In this article we have attempted to situate the recently discovered archaeological evidence from Huacones-Vilcahuasi within a larger discussion, which includes different facets. On the one hand, the accounting and recording artifacts (*kipus* and *yupanas*) found within the architectural nucleus of the site can be considered a clear indicator of the administrative activities performed in late pre-Columbian times. Comparable archaeological materials allow us to propose interpretations. The settlement we studied is located within a region particularly rich in discoveries of *kipus* and, most importantly, was inhabited during the Inca time by societies who were heirs of old traditions of calculation and recording that go back to the Middle Horizon. In this scenario, the floor *yupana* found in Huacones-Vilcahuasi demonstrates that local elites continued to use their traditional accounting system even after being incorporated into Tawantinsuyu.

Comparison of the material remains recovered with the available ethnohistorical information, has allowed us to recognize important

correspondences in regard to prehispanic accounting practices. For example, the accounting and distribution within the tribute system with *kipus* and *yupanas* took place “. . . in the main town of each province” (Valera [c. 1595] quoted in Garcilaso 2005 [1609], I:286; translation by the authors)³⁴, that is, in each provincial administrative center controlled by the Inca state (e.g., Farfán, Manchán, Huacones-Vilcahuasi, Incahuasi of Lunahuaná, and Sabaya). In addition, these actions were carried out, according to what is indicated in some colonial testimonies (Curatola and de la Puente 2013:233), within open areas like the large patio of the south complex of Huacones-Vilcahuasi. Large areas offered the necessary light conditions for long hours of counting, and could accommodate the authorities to whom accounts were offered, the *kipucamayos* and accountants, as well as the containers full of the goods to be registered.

On the other hand, the discovery of a storeroom that contained important quantities of chili peppers on the main platform of the northern complex of Huacones-Vilcahuasi, a private space possibly occupied by the elites that inhabited the surrounding residential areas, reminds us of storage practices reported from the architectural complexes of other late pre-Columbian sites of the Peruvian Central Coast, related to the Ychsma. These complexes, generically identified as pyramids with ramp, have often been linked to the partially centralized storage of tribute, which was collected in the storerooms of the regional elites. A similar situation can be suggested for our case study.

Thus, in the middle Cañete Valley, the presence and control of the Inca state would have manifested itself strongly with the establishment of an important Inca center (“another Cusco”), Incahuasi of Lunahuaná, with adminis-

it is eaten while someone represents the mayor of the community during a different game, its name is *alcalde uchu* (Corr 2010:86).

³⁴ . . . en el pueblo principal de cada provincia (Valera [c. 1595] cited in Garcilaso 2005 [1609], I:286).

trative strategies imposed to direct the economic exploitation of the area of Chaupiyunga (Marcone and Areche 2015:59, 64). These strategies included the management of state accounting systems (cross-linked floor *yupanas*) and the presence of resident bureaucrats in exclusively administrative sectors, and *mayordomos* working in separate storage sectors of the site. In the lower valley, the Guarco elites inhabiting the residential-administrative sectors of Huacones-Vilcahuasi, may have served as intermediaries between the Inca state and its people, with *mayordomos* responsible for directing tribute storage and accounting, and who, as we have pointed out, interacted face-to-face with their local lords and employed traditional accounting techniques and devices (floor *yupanas* with cavities).

In any case, the new discoveries in the archaeological complex Huacones-Vilcahuasi, as a result of a limited intervention, invite us to reflect on the administrative activities carried out in this settlement during late prehispanic periods, and on the role played by local elites in the organization and control of the economic resources of the Cañete Valley under the Inca regime. It also demonstrates the need to expand archaeological studies at this important Guarco site, which was in oblivion until recently.

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Figure 1. Locations of places mentioned in the text.



Figure 2. Panoramic view of the Huacones-Vilcahuasi archaeological complex in the lower Cañete Valley (photo by Gerardo Quiroga Díaz).



Figure 3. Plan of Huacónes-Vilcahuasi indicating the excavated areas.

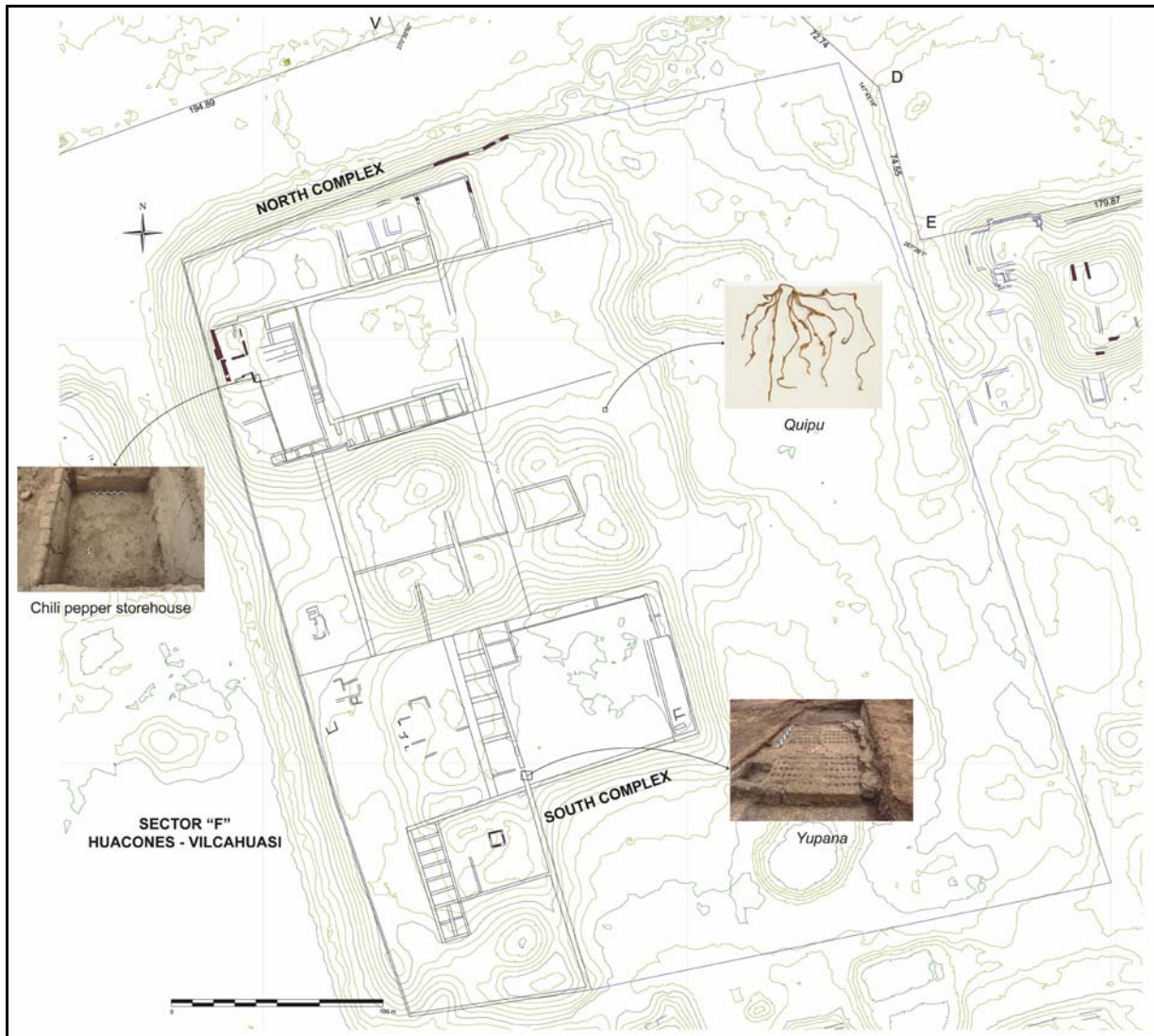


Figure 4: Locations of the finds in the North and South Complexes of Huacones-Vilcahuasi.



Figure 5: Views of the yupana found in the South Complex of Huacones-Vilcahuasi (photos by Rodrigo Areche Espinola).

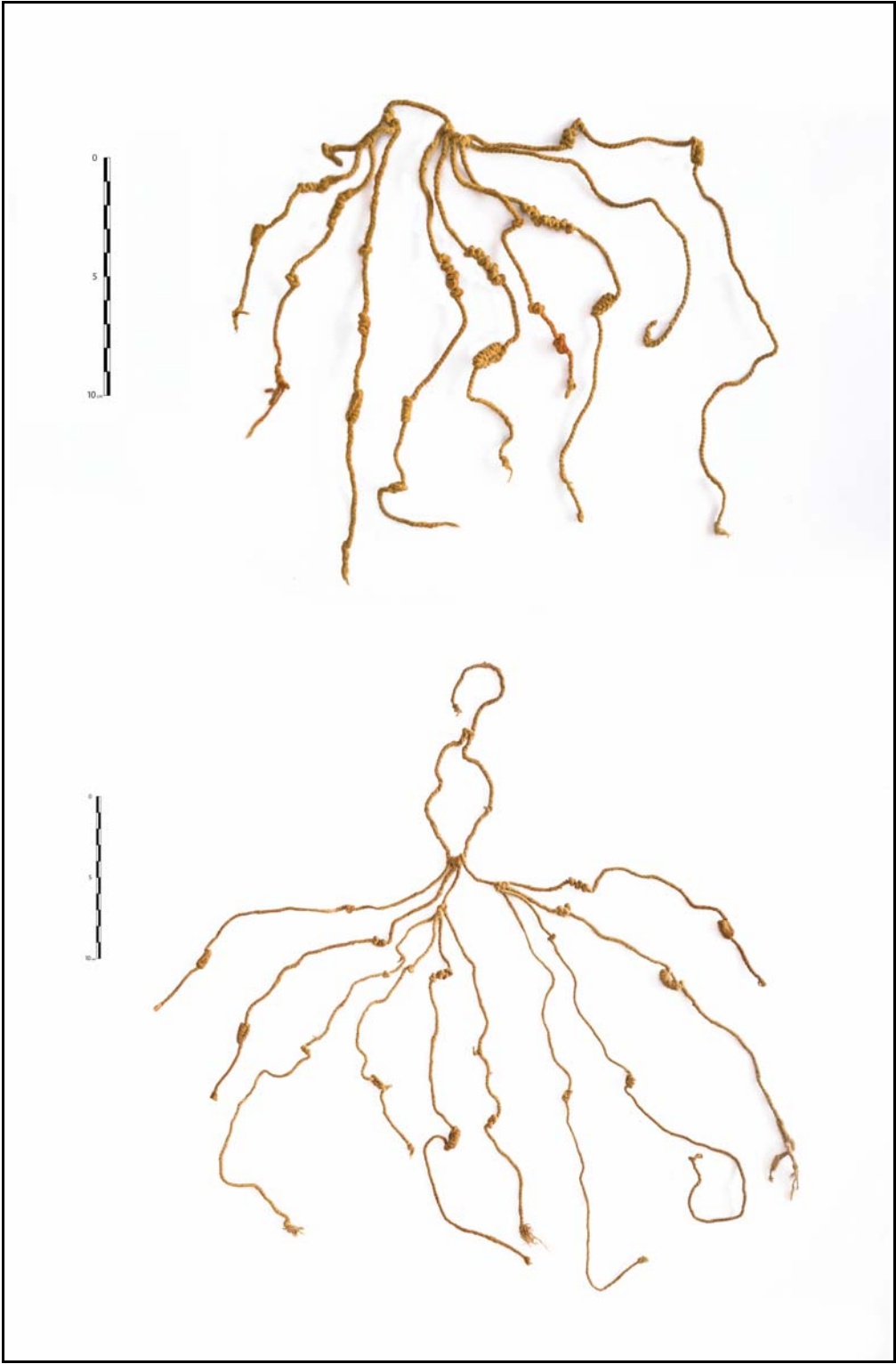


Figure 6. Khipus found in Huacones-Vilcahuasi (photos by Rodrigo Areche Espinola).

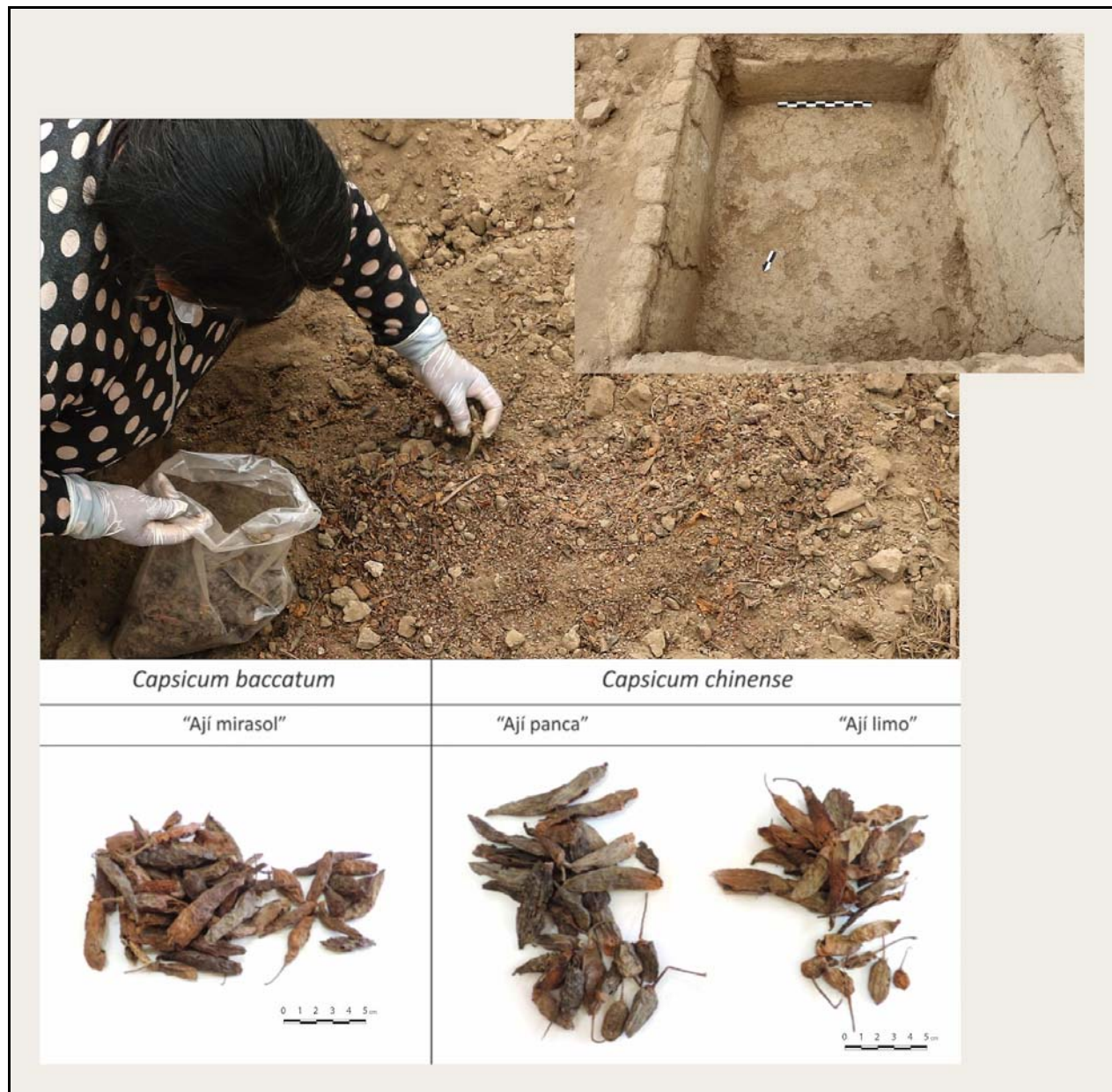


Figure 7. Excavation of chili pepper storeroom in Huacones-Vilcahuasi and remains of this crop that were found. Scale in excavation unit=1 meter.

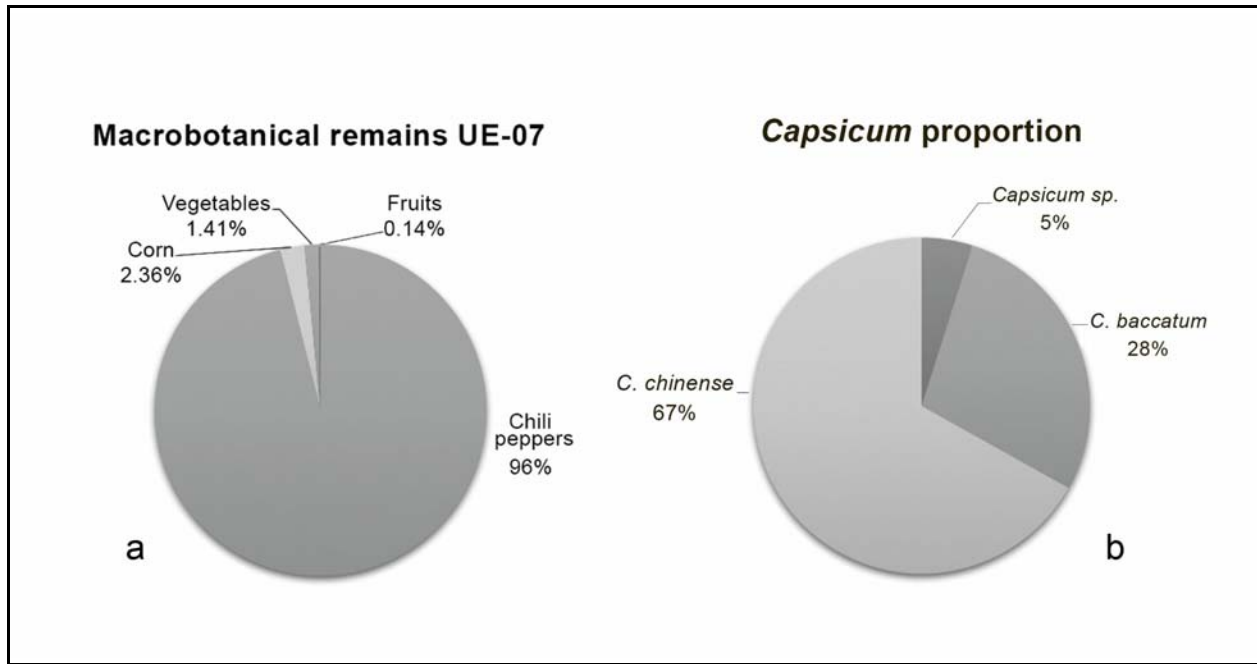


Figure 8. Pie charts showing (a) the percentage of chili peppers recovered in Excavation Unit 7 (UE-07), Huacones-Vilcahuasi, in comparison with other botanical remains and (b) the percentages of the chili species found.

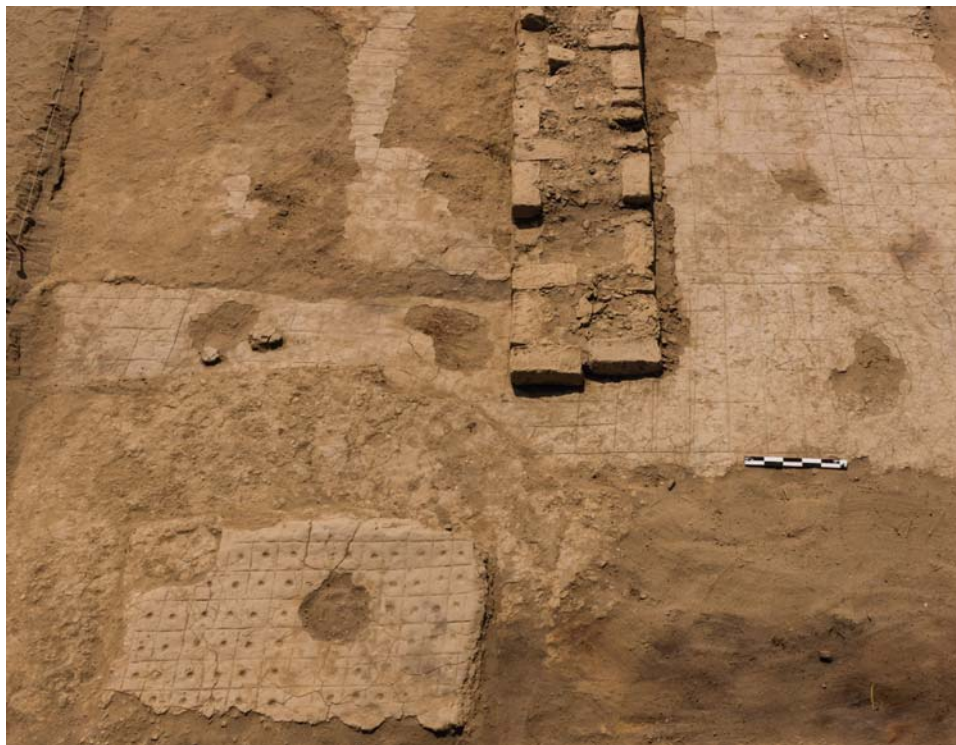


Figure 9: Yupanas found on an Inca floor in Sector A of the Chimú administrative center of Manchán in the Casma Valley (photograph courtesy of Nover Horna Gálvez).

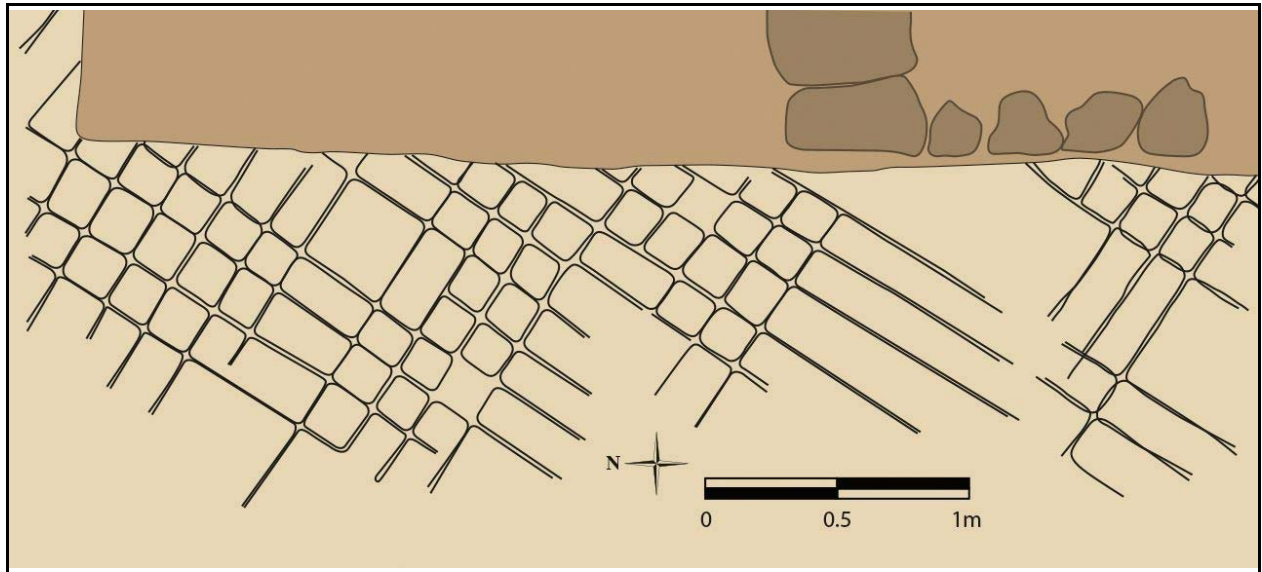


Figure 10. Yupana found below Structure 1, Sabaya, Moquegua Valley
(redrawn from Bürgi 1993: figure 58).



Figure 11. Guarco accountants using the yupana of Huacones-Vilcahuasi (artist's rendering by José Luis Díaz Carranza).