EXPLANATION OF DATA FROM EXCEL TABLES FROM GARY URTON'S "THE KHIPU DATABASE PROJECT" AND INTRODUCTION TO KHIPU KNOT STYLE AND POSITION

PAOLA TORRES NUÑEZ DEL PRADO
(ADVISOR: ALEJO ROJAS)

WHAT IS A QUIPU?

Frank Salomon (In "The Cord Keepers", 2004)

"A khipu (or *chinu* in Aymara) is an Andean information storage device made of cord. The concept is not uniquely Andean, and indeed devices fitting this minimal definition are attested in many cultures. Herodotus mentions one in use during the Persian wars. Other cases come from peoples as far afield as the New Mexico Pueblos, the Ryukyu Islands, and Hawaii. In the Hebrew Bible, Numbers 15:37-38 prescribe knotted "fringes" (tsitsit) as a vector of memory. Diffusionists have suggested that this far-flung distribution reflects an ancient dispersion of an eminently portable medium. There is no archaeological trail, though, and one could just as well posit independent inventions. Only in the Andes were cord records central to the cultures they served, or abundantly produced. Khipu chronology is obscure because few if any specimens have been radiocarbon-dated. William Conklin has documented a highly developed khipu art from Middle Horizon times, about 600-1000 CE, that is, a half millenium prior to Inka expansion; one of its striking features, the lashing of bright-colored thread in bands around pendants also appears in an otherwise Inka-looking specimen suggesting a continuous deep-rooted design evolution. As of 2004, pre-Inka khipu-related objects are appearing in even earlier contexts (Splitstoser et al. 2003).

Regarding Inka times (c. 1400 – 1532) Spanish chroniclers, including a few with close access to royal khipu masters, say that the cords served virtually all the data needs one could expect an imperial state to have. The attested uses include censuses; calendars; inventories of all sorts of things including weapons, foodstuffs, and clothing; tribute records; royal chronicles and chansons de geste; records of sacred places or beings and their sacrifices; successions and perhaps genealogies; postal messages; criminal trials; routes and stations; herd records; and game-keeping records. (…)

Millennialy old as it seems to be, and developed as it was among peoples who spoke a multitude of languages, the art of putting information on string may actually be a branching tree of inventions. In that case, studying the khipu as a single code would be as feckless as trying to study marks-on-paper as code."

Gary Urton (In "Signs of the Inka Khipu" 2003)

"In general terms, khipu are composed of a main, or primary, cord to which are attached a variable number of what are termed pendant strings. Many samples have only a few pendant strings, while a couple have upward of 1,500 pendants. To state definitively the average number of pendant strings on all khipu would be a difficult undertaking, particularly as our studies of some collections are incomplete. As an example, however, I note that for a collection of thirty two khipus recently discovered in Chachapoyas, in northern Peru, the average number of pendant strings on the twenty two samples that were well enough preserved to allow for close study were of 149 (the range is between 6 and 762).
Primary cords usually have a diameter in the range of 1/2 to 2/3 cms, and they often display complex bi- o multicolored spin and ply patterns. It is not uncommon for primary cords to be finished off with a "wrapping" composed of a cord made of two or three pairs of differently colored spun and plied yarn. In some cases, tassels may be tied onto primary cords indicating divisions or classifications (of some manner) of the information registered on groups of pendant strings. I have examined some twenty khipu samples in various collections that have large needlework "bundles" that terminate one end of the primary

cord. Salomon has described similar bundles on a few samples of khipu used today for ritual purposes in the Peruvian central highland of Tupicocha. Such “end ornaments” in Tupicocha are referred to as *pachacamanta* ([which means]“about”/”concerning the hundred”, Salomon, 2002). Given that the unit of one hundred tribute payers was an important organizational unit in Inka administration – often used as a synonym for the sociopolitical and communal labour groupings referred to as ayllu – these khipu ornaments are retained in the samples from Tupicocha today may offer a clue to the significance of such ornaments on archaeological khipu. That is, they may have indicated the administrative class of khipu in question, as well as its general subject matter and the magnitude of units recorded.

Pendant strings may have attached to them secondary, or subsidiary, strings, which, in turn, carry subsidiary (i.e., tertiary) strings, and so on. Some khipu also display top strings; these strings are attached in such a way that they leave the primary cord in the opposite direction from the pendant strings. In some cases, the attachment of a top string is by means of a loop that binds the top sting into the attachments of a group of pendant strings across the primary cord.

As I discuss in greater detail below, on most khipu, knots of three different types were tied into pendant, subsidiary, and top strings. In the case of those khipu that recorded quantitative values (rather than narrative records) the three types of knots are tied in patterned arrangements of clusters along the body of strings to indicate increasingly higher powers of ten.

Some of the feature of khipu, such as decimal arrangement of knots on many samples, are described for us in Spanish accounts written during the colonial era either by Spaniards or by literate Andean (especially Garcilaso de la Vega and Felipe Guamán Poma de Ayala). For an appreciation of certain characteristics of khipu construction, however, we had to wait for the results of careful scientific study of museum samples in modern times.

With this understanding of some of the main features of the khipu, we can now turn to the question of the possible nature of the signs encoded on these devices; that is, was this a memory-cucing device? Was it a system of writing? Or was it some other type of record keeping?

(In “Inka History in Knots” 2017)

“There appear to be two major recording traditions represented in the approximately 923 khipus surviving from Inka times. One type is identified as quantitative/statistical accounts, and the other as “narrative” accounts. Statistical khipus knots record numerical information in the base -10 system of numeration used by Quechua/Inka accountants; these records probably also contain some nominative, identifying labels specifying the nature of the information recorded. While we are able to interpret numerical/quantitative accounts, in only a few circumstances can we make confident guesses, or surmises, about the identifying about the identifying labels attached to these numerical data. Narrative khipus are ones whose knots do not follow the decimal format; rather, they are formed and arrayed along strings in ways that are significantly – I would say radically – different from the decimal-based examples. Such khipus might have included information about Manko Khapak, Pachakitu Inka, and the other great individuals of Inka history. We cannot read these narrative khipus.”

Monday, July 2, 2012

Interview included in Punto.edu Magazine from Catholic University of Perú

«The Incas used quipus to tell stories and myths, but we don't know how»

Dr. Gary Urton is the director of the Khipu Database Project and has been involved in the study and cataloging of the structure, colors and patterns of hundreds of quipus for more than a decade. Last week he visited our campus, invited by the Andean Studies Program in our University, and presented the extracurricular seminar: "Approaching the Rosetta Quipu: A correspondence between six quipus and a colonial document of the Santa Valley."

What mysteries do the quipus store?

Author: Luis Yáñez

(Translation: Paola Torres)

Has it been possible to determine the use that the Andean civilizations gave to the Quipus?

According to the information collected from chronicles and the study of the same **quipus** we know that its use was related to the **administration of the empire**. Currently we don´t fully understand this concept, we relate it to the bureaucracy, but we have to remember that for the Incas the administration was fundamental to **control and manage** the resources, time and space of the Empire´s inhabitants. It had to do with all aspects of people's lives, as there was no division between public and private life as we understand it today.

What was the degree of power that quipucamayoc had during the Incanato [a.k.a. Incan Times]**? After all, the use and handling of these quipus was not known to all its citizens.**

At the summit of the empire there were thousands of quipus and hundreds of **quipucamayoc** working at various levels, from those in charge of a small community in the countryside to those in Cuzco, keeping the **economic and administrative data** of the entire empire. Quipus were objects made of cotton or camelid wool, which were knotted and dyed with techniques that were well known in the field by weavers. Then there was no big break between the knowledge related to the **manipulation of threads** between the common people and the Quipucamayoc, but the difference lies in the **interpretation** of the meaning of knots, threads and colors.

Has it been established what meaning these elements had?

In some documents there is information about the meaning of about four or five colors, but the problem is that we have a very limited understanding of their use. We know that they used dozens of colors, that interwoven threads of different color and that

they could work with up to 5 colors in the same thread. All this surely has a meaning that we have lost and that no chronicle indicates in its total complexity.

How many quipus have been recovered for research?

We know of approximately **820** existing **copies** , both from the Inca Empire and from the beginning of the Colony (it is very difficult to distinguish between the two). The largest collection consists of 350 quipus found in the Ethnological Museum in Berlin (Germany). Additionally, it is estimated that there may be another 200 quipus in **private collections** . And there are others that can no longer be studied because they are badly mistreated due to the passing of time.

Are there two equal quipus or are they unique and unrepeatable instruments?

Of the 820 known quipus, there are a dozen, perhaps **twenty pairs of quipus** with nodes in the same location, size and shape, in which **the same quantitative data** has been recorded through a system of decimal values. These copies are only a shadow, an echo of a check and balance system that was much broader and more complex in the incanato and that incorporated very modern accounting principles.

One of the chronicles of the **Inca Garcilaso de la Vega** points out that each community, large or small, had four quipucamayoc and that they all kept the same values. Do not forget that in the Andean communities there was a fundamental division between the **ayllus** of *Hanan saya* [1] and those of *Hurin saya[2]*, so each group had at least one quipucamayoc in charge of checking the values of the other and vice versa.

While it is true that the quipus mostly concentrated numerical and accounting information, many times we have worked with the hypothesis that we would also be talking about a writing not yet deciphered within the quipus.

The chronicles say that the Incas had a kind of quipus in which they recorded data for storytelling, myths and other stories , but we don't know how. We think that perhaps these quipus were used as tabs in which they did not "write" the whole story, word for word, but some essential names. For example, to narrate the myth of the appearance of Manco Cápac in Pacaritambo, the concepts of "Manco Cápac", "Pacaritambo" and "appearance" were recorded; the rest depended on the intelligence and creativity of quipucamayoc.

What are the main results of the Khipu Database Project, a project that you direct?

In the Khipu Database Project at Harvard we have a very detailed database on the **structure, colors and numbers** of 600 of the 820 quipus studied. **We are trying to recognize repeated patterns , to see if we can know more about the social and political organization of the administration of the mitas, the tribute and the work of the Inca State.**

One of our most important studies reveals a correspondence between a colonial document and a quipus collection. We had been looking for this coincidence for several years, it is like a “Rosetta Quipu” (*N. of W. .: In reference to the Rosetta Stone, an Egyptian stele written in three different languages*), which will help us understand the meaning of various characters.

How did this finding happen?

First, it should be remembered that from the beginning of the Colony the Spaniards had an

interest in establishing their own state, **so they transferred the administrative data registered in the quipus in their documents. To do this, they called the quipucamayoc to read their quipus while an interpreter translated into Spanish and a scribe took record. This gave us the possibility of finding a transcript of a quipu in a written document.**

The document was published by the **Chavimochic Project** within a series of administrative papers of the Colony. It records the tribute that the residents of a community had to pay, as a standard. **On the other hand, in the Temple Radicati Museum Library - which is owned by UNMSM - six quipus from the Santa Valley are preserved, whose threads are organized into 132 distributions , which coincide with the 132 names that appear in the document.** We have not yet deciphered the way to translate the names in the quipus but hopefully through them significant information will arise for our studies and we will come to understand the structure of the quipus more intimately.

Gary Urton is Dumbarton Oaks Professor of Pre-Columbian Studies in the Department of Anthropology at Harvard University

Personal notes referring to the article:

[1] In Freder Arredondo, "Symbolic Duality", Thesis from the Catholic University of Peru http://tesis.pucp.edu.pe/repositorio/bitstream/handle/123456789/74/ARREDONDO_BAQUERIZO_FREDER_DUALIDAD_SIMBOLICA.pdf

"María Benavides: "Social duality and ideology in the province of Collahuas" (1992), made the study in the department of Arequipa, was based on colonial documents and ethnographic works of Zuidema, Rostworowski, Murra, Silverbatt among others, to support the term of social and ideological duality as a social division of [Inca] ethnic groups into 2 partialities or halves: hanan saya (upper part) and hurin saya (lower part) (...) in which a hierarchical connotation prevails. The reasons for the duality would be:

a) endogamic or exogamic halves.

b) Bipartite system of ethnic groups with hegemony of a sector by conquest.

c) Ecological control of different Puna / Valle geographical areas.

d) Division of territory based on irrigation systems and river courses.

e) Significant or symbolic of complementarity and reciprocity man / woman and / or right / left."

[2] in *Hanan and Hurin: history of an inca structural system* by Isabel Yaya

"12. But, if the likelihood of the narratives is not a reliable criterion to determine their authenticity, the narrative divergences cannot be attributed only to the colonial actors either because, already before the Spanish conquest, the Inca dynastic stories were historical elaborations that did not form an unchanging and consistent corpus. On this point, Maria Rostworowski (1988: 12-14) observed that the chroniclers failed to fully understand not only a sociopolitical system outside their own system, but also radically different memory records. In fact, primary sources indicate that the Incas conceived at least two different means of preserving memory: the famous knotted ropes called khipus and painted planks of wood (Acosta, 1962 [1590], Lib. VI, chap. VIII: 290) . The former recorded a varied set of administrative data and also epic accounts relating to the lives of deceased kings. They were in the possession of unique specialists (khipukamayuq) capable of stating their content. The latter, Father Cristóbal de Molina (1989 [1575]: 50) tells us, described "the life of each of the yngas and the lands he conquered, painted by his figures." They were preserved in the Puqin kancha, a house of the Sun located "three shots of the city's firegun" (Cobo, 1964 [1653], Lib. XIII, chap. XVI: 185). (...) Sarmiento places the preparation of these works under the reign of Pachacuti Yupanqui after the sovereign summoned all the historians of his domain to be told about their ancestral traditions: Cuzco He also ordered that the

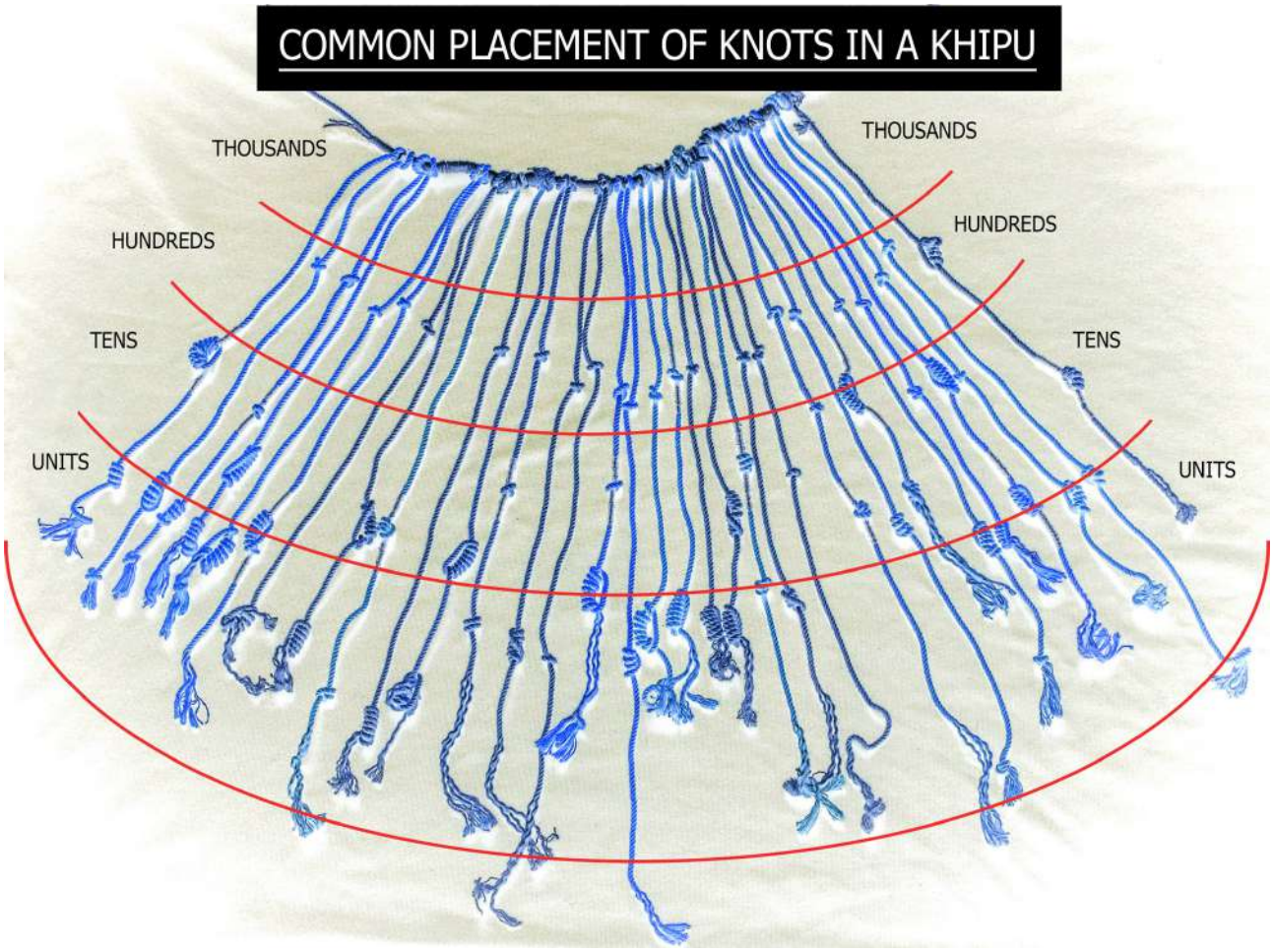
influential members of the Tupac Yupanqui lineage and this king's mummy be eliminated because they had actively supported Huáscar. Finally, the Atahualpa captains rushed to kill the khipukamayuq of this offspring and set their records on fire. They thus intended to annihilate the memory of Tupac Yupanqui because "they were to start again (new world) of Ticci Capac Inga, which I wanted to call Ataovallpa Inga" (Speech, 1920 [1543-1608]: 4; Sarmiento de Gamboa, 1988 [1572], chapter LXVII: 162-164).

14. Thus, the historical Inca stories were undoubtedly the subject of disputes and legitimation instruments before the colonial era. Thanks to the memory of the Khipus, noble families vindicated their rights to obtain positions of authority based on their prestigious ancestry or invoking the support given by their ancestors to the kings of yesteryear. A royal lineage devoid of its historical tradition was not only deprived of political influence, but also deprived of ritual prestige since epic songs were publicly enunciated during the most important festival. The reciter of each lineage rivaled wit and oratory talent, exalting the governmental qualities and military feats of his ancestor. As a result, the compositions were inevitably impregnated with divergences of opinion and tensions inherent in the relationships between royal kinship groups (Salomon, 1999: 84).

    Finally, colonial dictionaries associate the term hanan with what is found above and outside, while hurin - probably urin in its original form - designates what is inside (Arellano Hoffmann, 1998; Cerrón-Palomino, 2002).

(...)

“Those who attracted the Inca wanted them to populate Hanan Cuzco, and that's why they call them the Highest, and those who the queen summoned to populate Hurin Cuzco, and that's why they called them the Lower (...) And he commanded that there should be only one difference and recognition of superiority: that those of Higher Cuzco were respected as firstborns, the older brothers, and those of the Lower portion were as second children” (Garcilaso, 1985 [1609], Lib. I, chap. XVI: 40; see also Cobo , 1964 [1653], Lib. XII, chap. III: 63).



Most quipus found follow this basic structure in the Decimal Numeric System:

UNITS

Knots found towards the end of the pendants are said to be the notation of the units, to mark numbers that are less than 10. Usually they are tied as “long knots” or “eight-style” knots.

TENS

Knots found above this section are multiples of 10 (multiplied by a whole “number” from 1 to 9). Depending of the quantity represented, these single knots can come up in groups from one knot to nine knots (again, there are exceptions).

HUNDREDS

In the “hundreds” section, we find the same structure of knots as that in the “tens” (single knots in groups that vary from one to nine) but due to the position, we know that they refer to multiples of 100 (multiplied by numbers from 1 to 9 respectively).

THOUSANDS

Although there are Quipus that represent numbers beyond the thousand, in this schematic only numbers up to 9999 could be represented (actually, the knots of this particular graphic would belong to an atypical Quipu, more similar to the ones found in Tupicocha village in Lima). Again, this

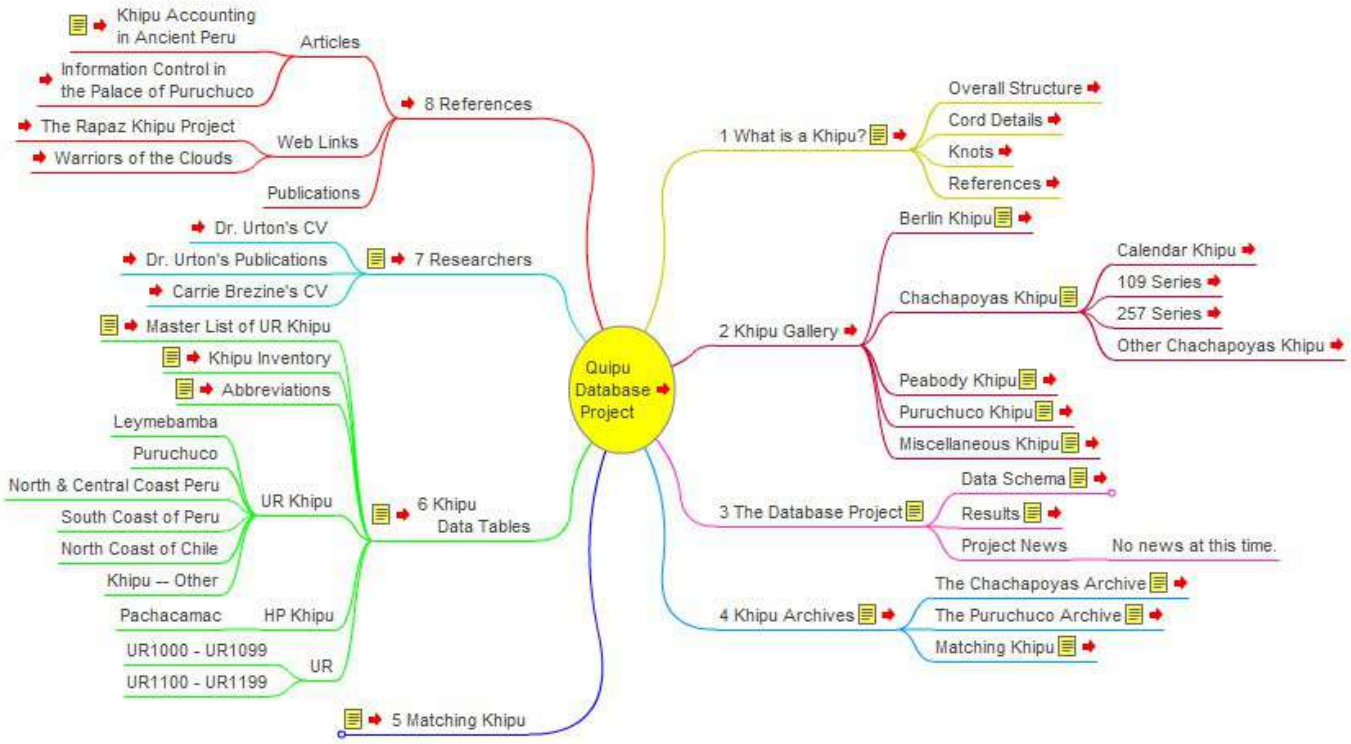
section usually uses single knots, from one knot up to nine knots, that represent multiples of a thousand (multiplied only by numerals from 1 to 9).

ABOUT THE KHIPU DATABASE PROJECT

Project Description

The Khipu Database Project began in the fall of 2002, with the goal of collecting all known information about khipu into one centralized repository. Having the data in digital form allows researchers to ask questions about khipu which up until now would have been very difficult, if not impossible, to answer. The Khipu Database Project was funded 2002-2004 by the National Science Foundation and Harvard University, and in 2004-2005 is funded by the National Science Foundation.

The KDB and its associated data entry application were designed and implemented specifically for the use of this project. The khipu data schema is modeled on the physical structure of khipu. The overall structure of a khipu is that of a branching network in which the number of branching levels is highly variable, but in which components at every level share certain characteristics. The data schema for the KDB embraces the following critical facts about khipu construction: the interlocking relationships between khipu components, the branching or tree-like structure of khipu, the similarity of certain components, and the multi-dimensionality of khipu variables. (from https://khipukamayuq.fas.harvard.edu/)



Map of site (taken from internet site http://www.gogeometry.com/incas1/quipu/quipu_database_project_mind_map.html)

Khipu Codes

Common abbreviations used in recording khipu data.

Attachment

R	recto
V	verso

Beginning (of Primary Cord)

B	broken
D	doubled
K	knotted
NB	needlework bundle
WB	wooden bar
X	affixed to other cord
T	twisted
TL	tassel//borla

Color Patterning Codes

-	barber pole	Two or more colors twisted together.
:	mottled	Multiple colors are spun together to create the cord, resulting in an irregular mottled appearance.
%	with element…	Cord is primarily one color, with one element of another color run through it.

Khipu Codes

Common abbreviations used in recording khipu data.

Cord Types

PA	loop pendants	Pendant strings affixed to the primary cord at both ends.
M	marker	Tassels, small strings, needlework bundles, or other miscellanea attached to primary cord.
K	knot	Used to denote knots on the primary cord.
TPA	top loop pendant	A loop pendant which "hangs" in the opposite direction from the majority of other pendants

Fiber Types

A	alpaca	
L	llama	
CN	cotton	
W	wool	Sheep's wool
V	vegetal	Plant fiber
CL	camelid: llama or alpaca	
CC	cotton & camelid	
CW	cotton & wool	
X	indeterminable	Fiber classification cannot be determined
H	human hair	
AH	animal hair	

Knot Types

L	long	Used for unit values 2 - 9
E	figure eight	Used for 1
S	single	Denote 10's or multiples of 10 (100, 1,000, etc)

Cord Terminations

B	broken
C	cut
R	ravelled
K	knotted
D	doubled
U	unfinished

Structure Types

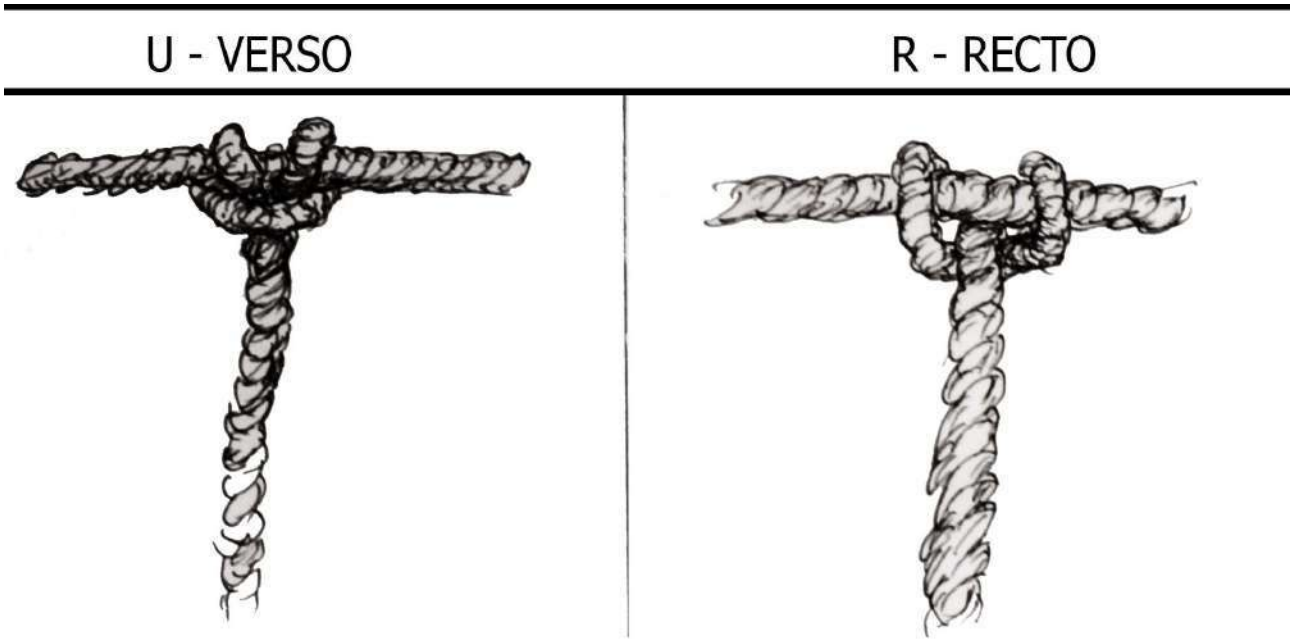
P	plied cord
B	braid
W	wrapped cord

GRAPHICS EXPLAINING CODES USED IN THE DATABASE

**Commented by Alejo Rojas Leiva, Archaeologist specialising on Quipu research, Peru*

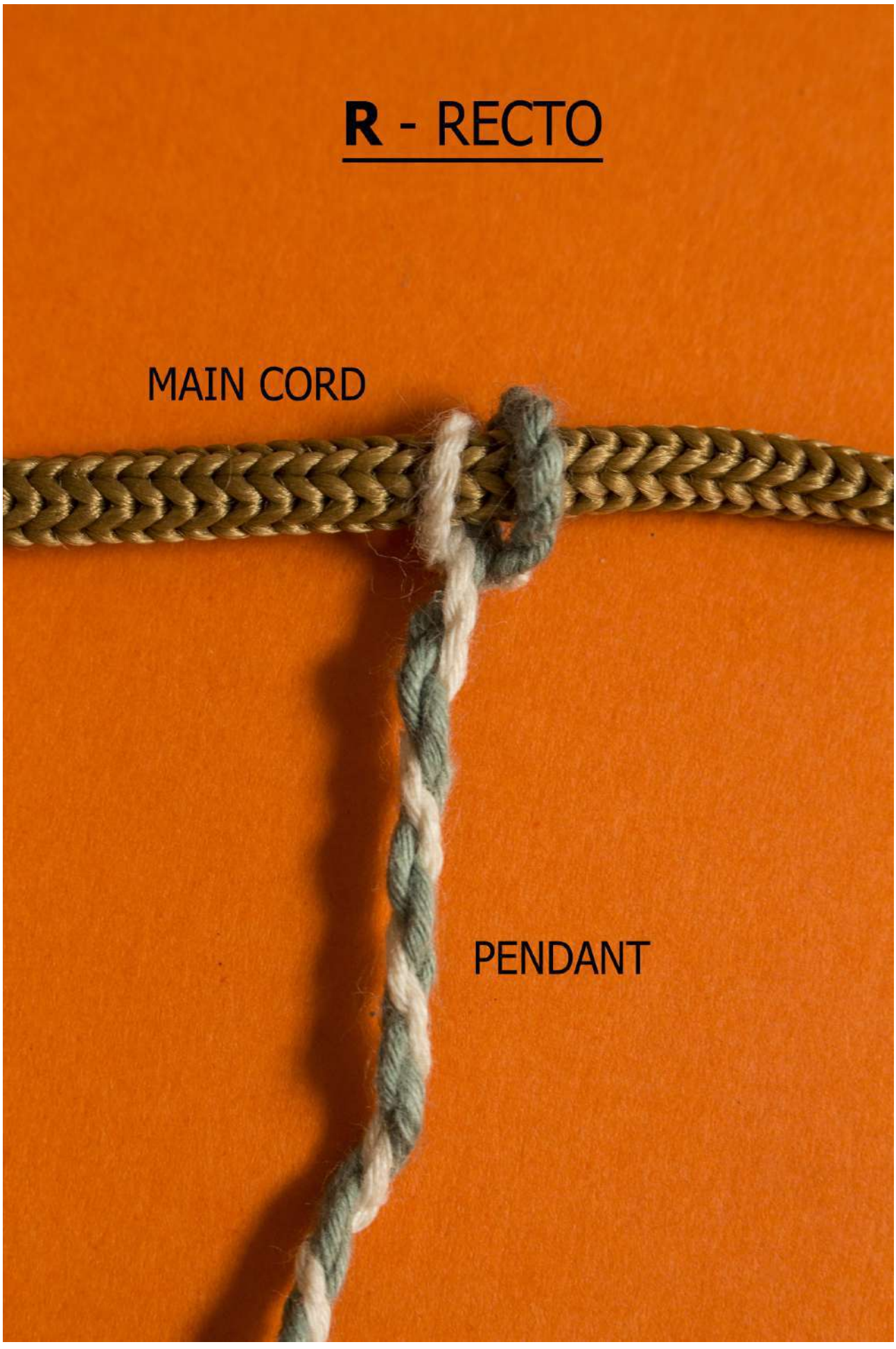
Pendant attachment type:

R - recto
U - verso

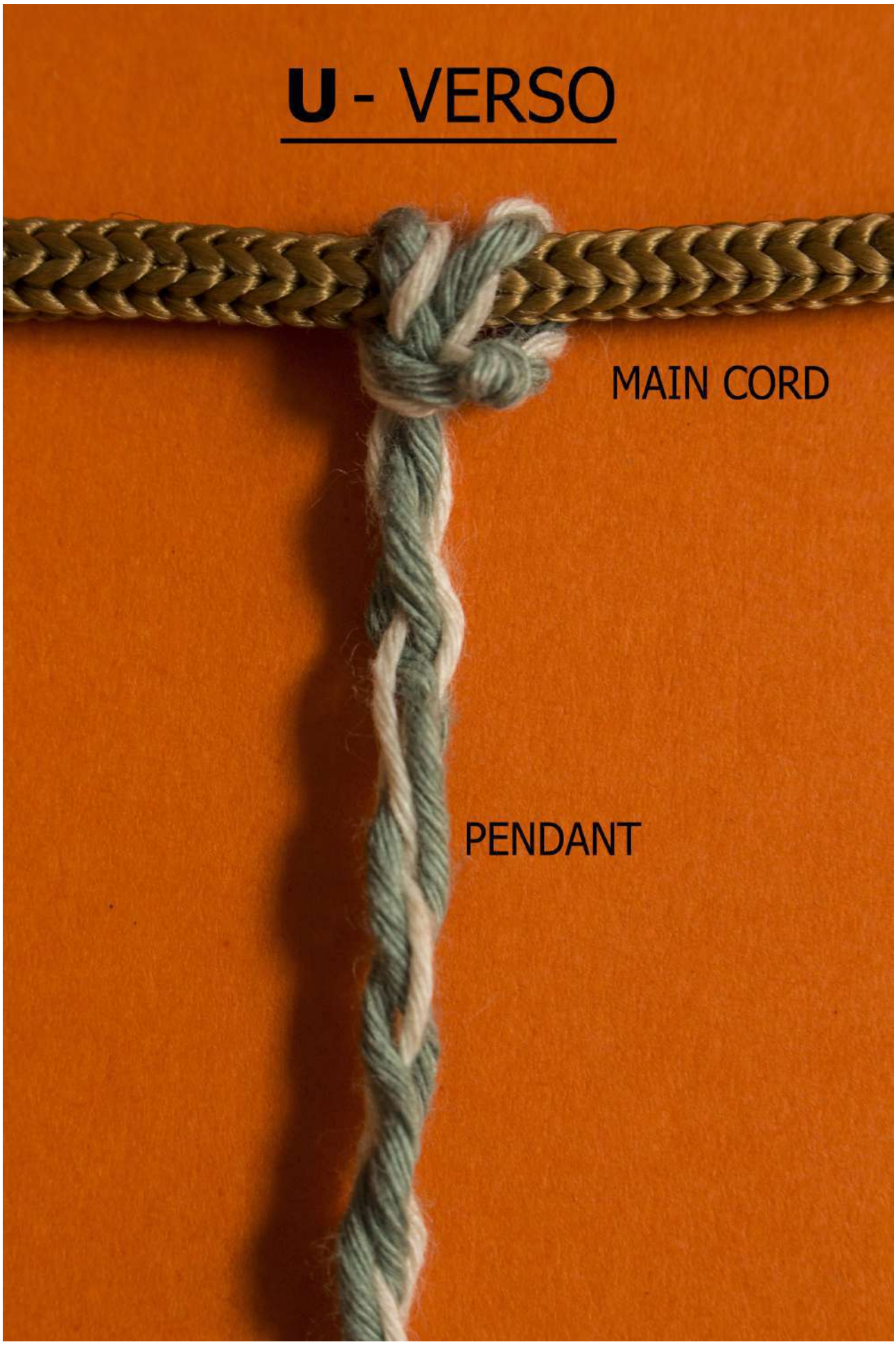


**Anchor identity. Just as a sheet of paper has a face ("recto") and a back or reverse ("verso") the same applies to the cords. We know that the first way of anchoring (in the graphic on the left) is the most frequent (orienting the folded extreme of the cord towards the left) and is, at the same time, the appropriate orientation for control of the cords (by allowing to secure or release the anchor). Therefore, the first orientation of the anchor should be "recto" and the second one "verso"; that is, the terms should be used the other way round, flipped. Although irrelevant to records themselves, my opinion is that this would be important for analysis and interpretation.*

R - RECTO



U - VERSO

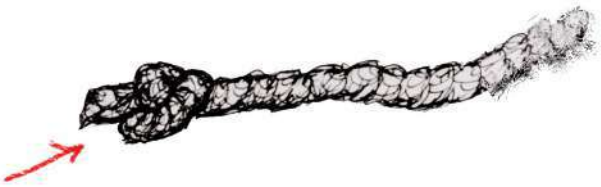


Beginning (of Primary Cord)

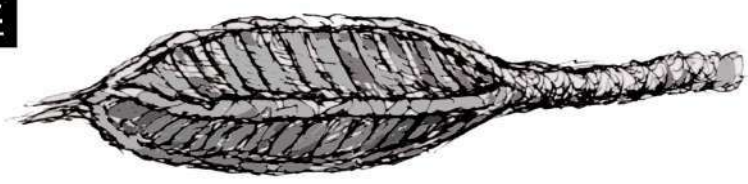
B - BROKEN

D - DOUBLED

K - KNOTTED



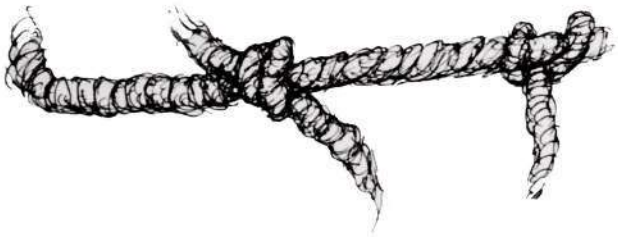
NB - NEEDLEWORK BUNDLE



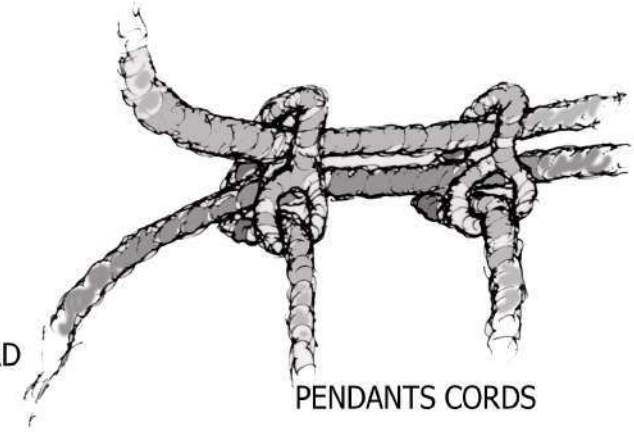
WB - WOODEN BAR

CORDS ATTACHED TO WOOD

X - AFFIXED TO OTHER CORD



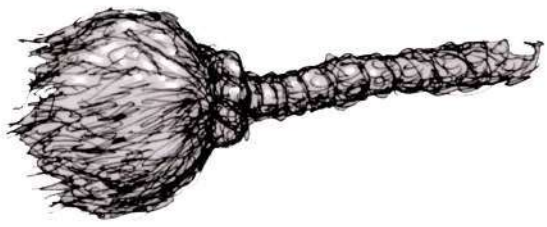
AFFIXED CORD



MAIN CORD

PENDANTS CORDS

TL - TASSEL OR BORLA

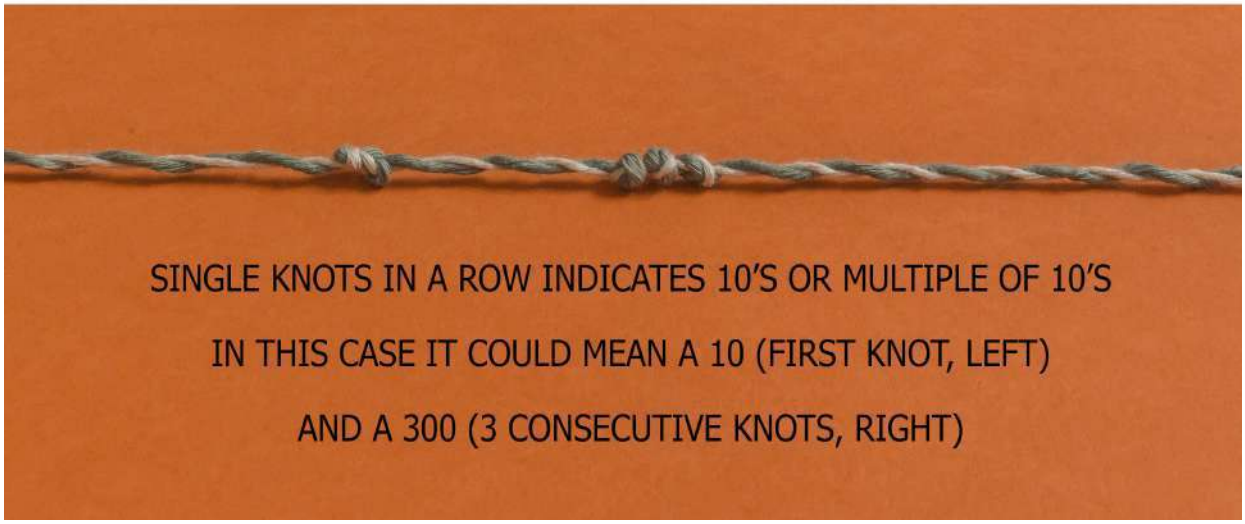


Color Patterning Codes

-

BARBER POLE:

TWO OR MORE COLORED COLDS TWISTED TOGETHER



: - MOTTLED

MULTIPLE COLOR CORDS ARE SPUN TOGETHER CREATING A CORD

WITH AN IRREGULAR MOTTLED APPEARANCE

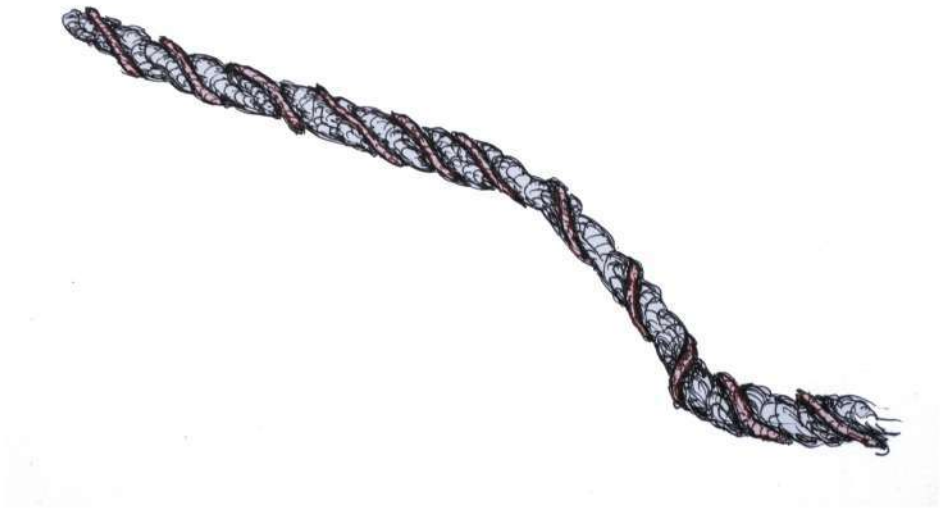
**A "spiral" cord(barber pole style) is obtained by twisting (with its opposite re-twisting). A "mottled" string is a double twisted string or a "spiral" string with an additional twist. Both cases commonly have two colors.*

% - WITH ELEMENT: CORD IS PRIMARY ONE COLOR

WITH AN ELEMENT OF ANOTHER COLOR RUN THROUGH IT

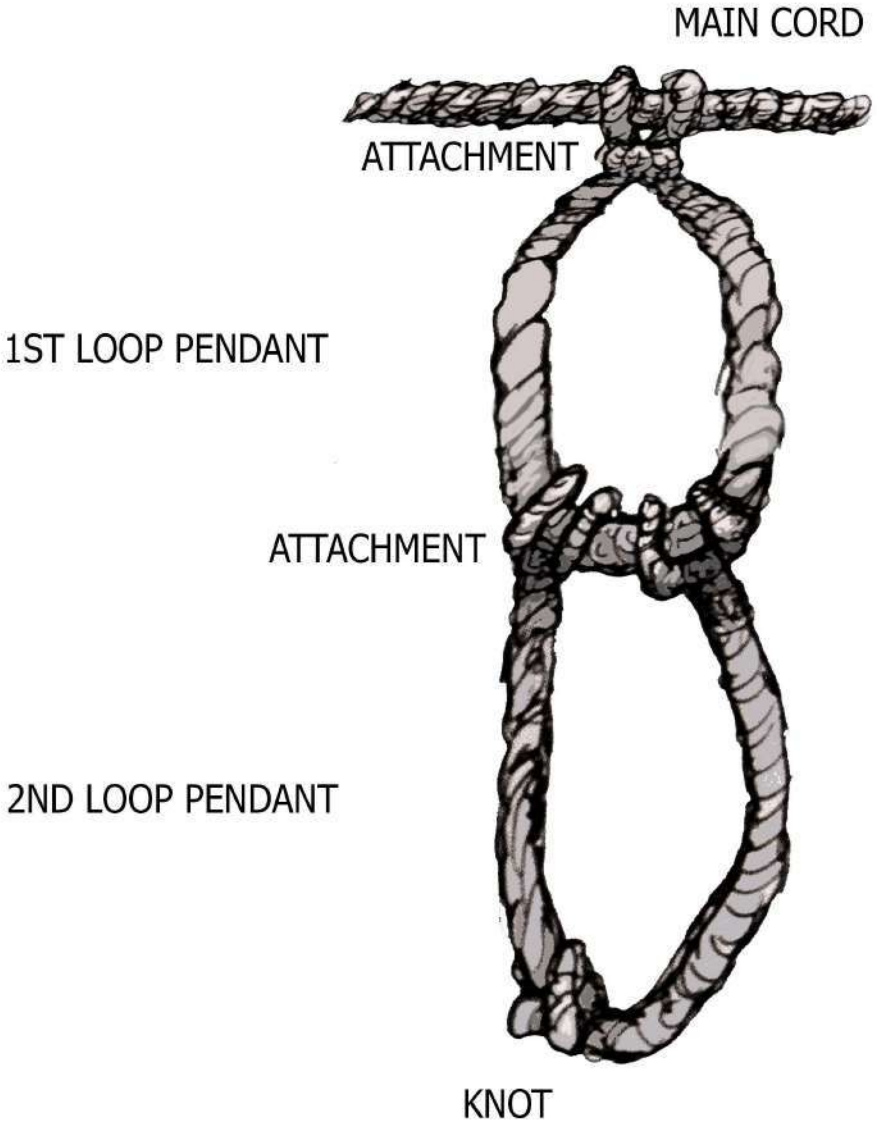
**The "wrap" is a thread that goes around a cord (“canuto”) as, I understand, from the image. Another reading that I can make from these images, thinking about the Quipus from the Pachacamac collection now, could be that of a "mottled" string with some symmetry in colors. For example, 70% of a color with 30% of another color while a typical "mottled" is 50% 50%.*

% - WITH ELEMENT

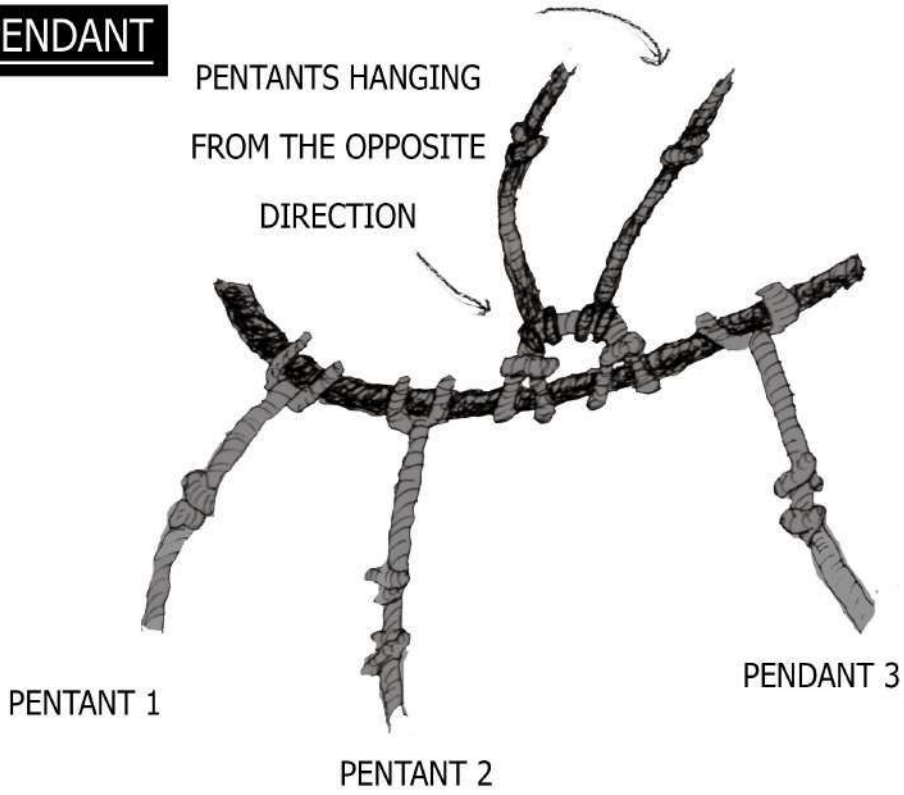


Cord Types

PA - LOOP PENDANTS



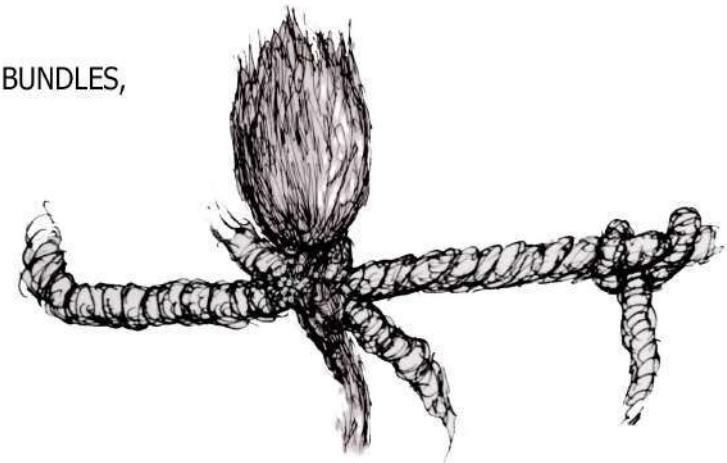
TPA - TOP LOOP PENDANT



*There are cases to consider, like this one (IPA) or the previous one (PA), where its incidence is almost exceptional (1 or 2 cases), it is only presented in one example, or can even respond to a reading problem.

M - MARKERS:

TASSELS, SMALL STRINGS, NEEDLEWORK BUNDLES,
OR OTHER MISCELLANEA ATTACHED
TO PRIMARY CORD

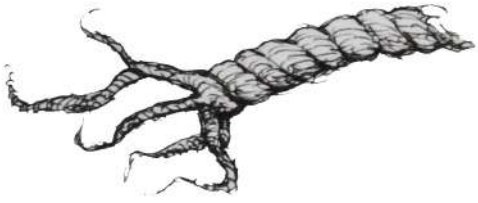


Cord Terminations

B - BROKEN CORD TERMINATION

C - CUT CORD TERMINATION

R - RAVELLED CORD TERMINATION



U - UNFINISHED

**The registration criteria should distinguish incomplete from complete ropes. Incomplete strings are the broken ones (B) and the cut ones (C). Meanwhile, the complete ropes are: with final knotting (K) and the untied ones (U) that would include strings with a sharp cut, with a loose finish, etc. Thus, the last two categories indicated ("R" and "U"), graphically very similar, could be related. In general, particular features (or attributes specific) should be recorded in the "Observations" or their condition indicated otherwise.*

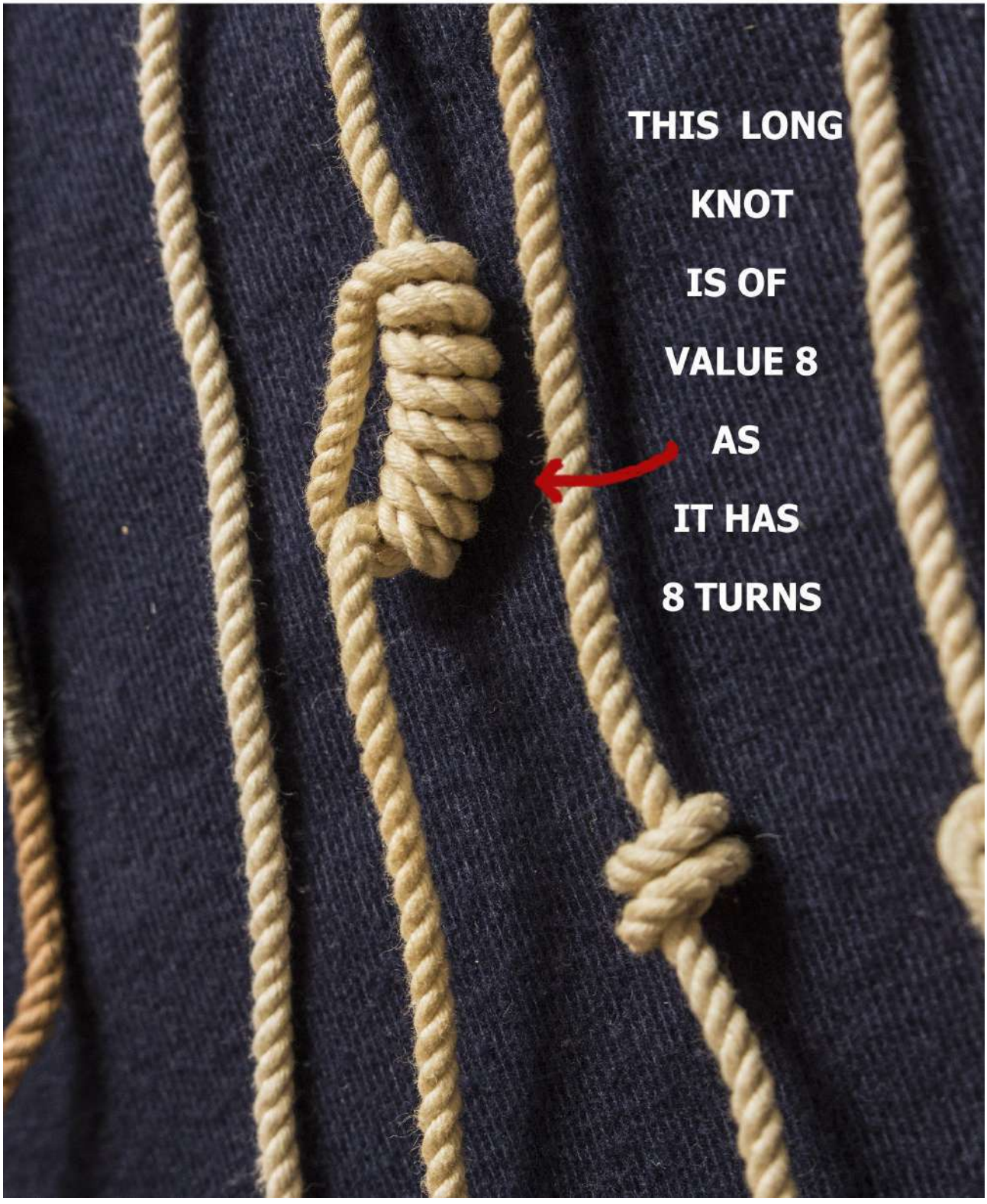
K - KNOTTED CORD ENDING

D - DOUBLED CORD ENDING

Knot Types

L - LONG KNOT: REPRESENTING

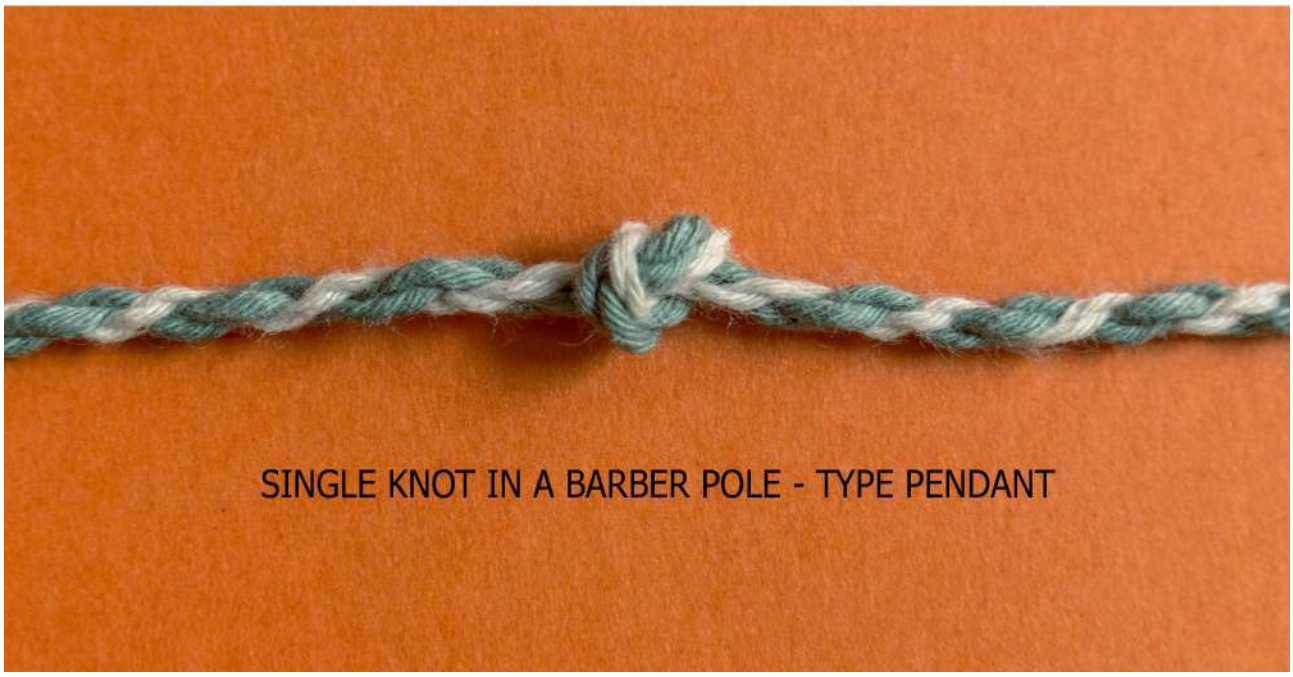
NUMBERS FROM 2-9 (WHEN FOUND IN UNITS AREA)



E - FIGURE 8: USED FOR UNIT VALUE 1

S - SINGLE KNOT: DENOTES 10'S OR MULTIPLES OF 10

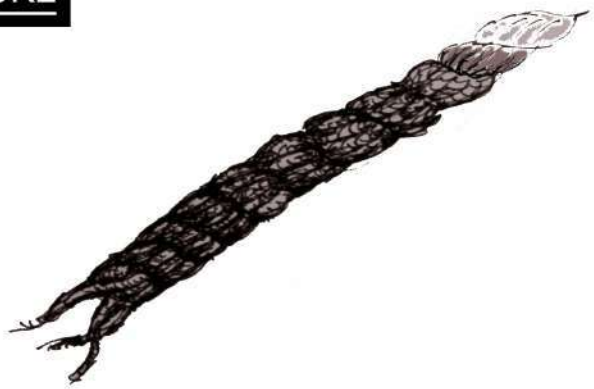
(WHEN NOT IN "UNITS" SECTION)



SINGLE KNOT IN A BARBER POLE - TYPE PENDANT

Structure Types

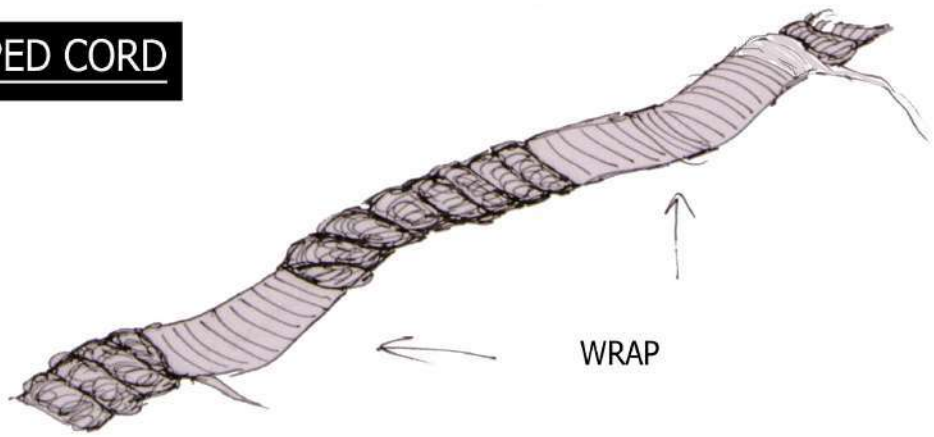
P - PLIED CORD STRUCTURE

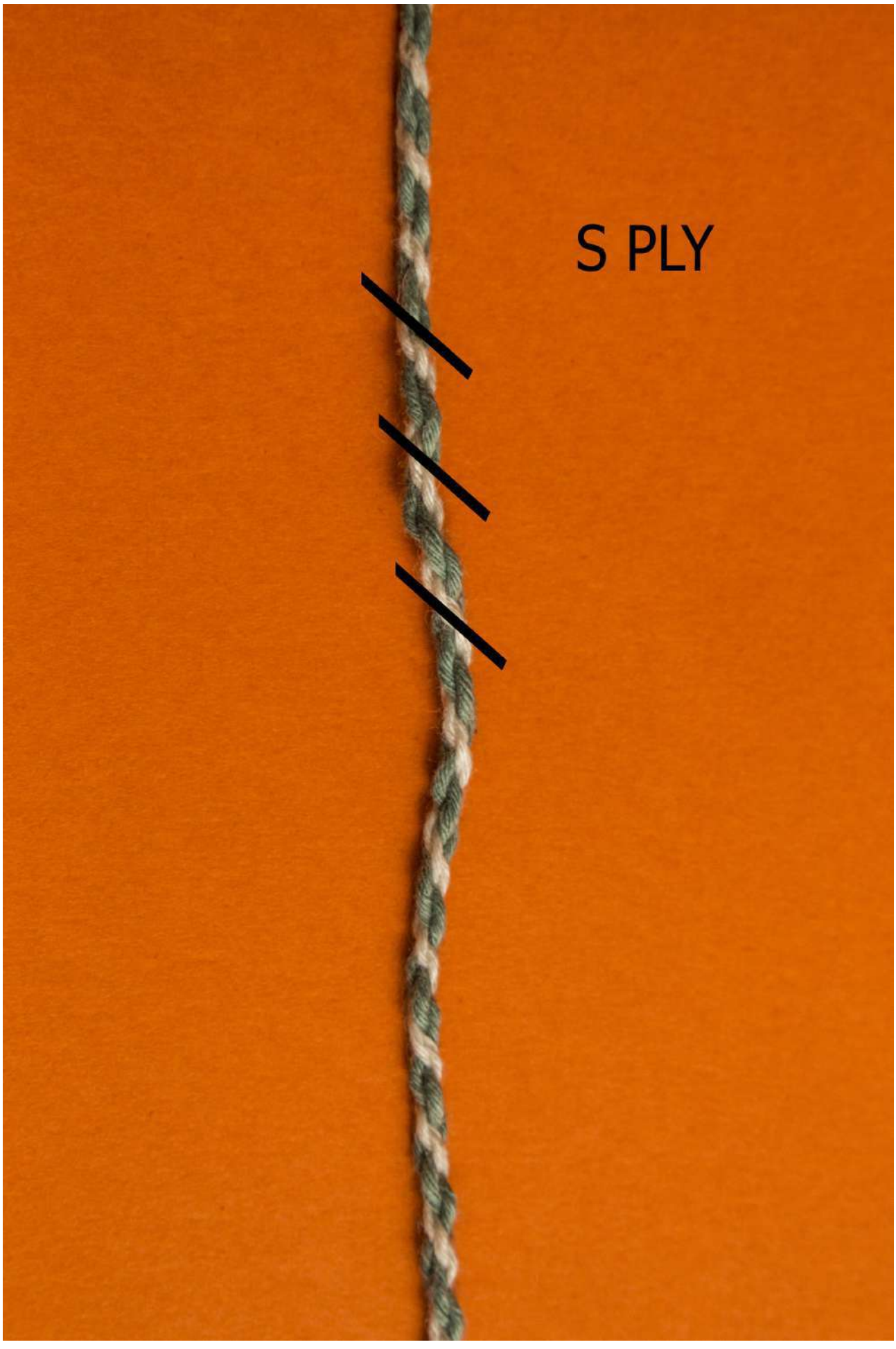


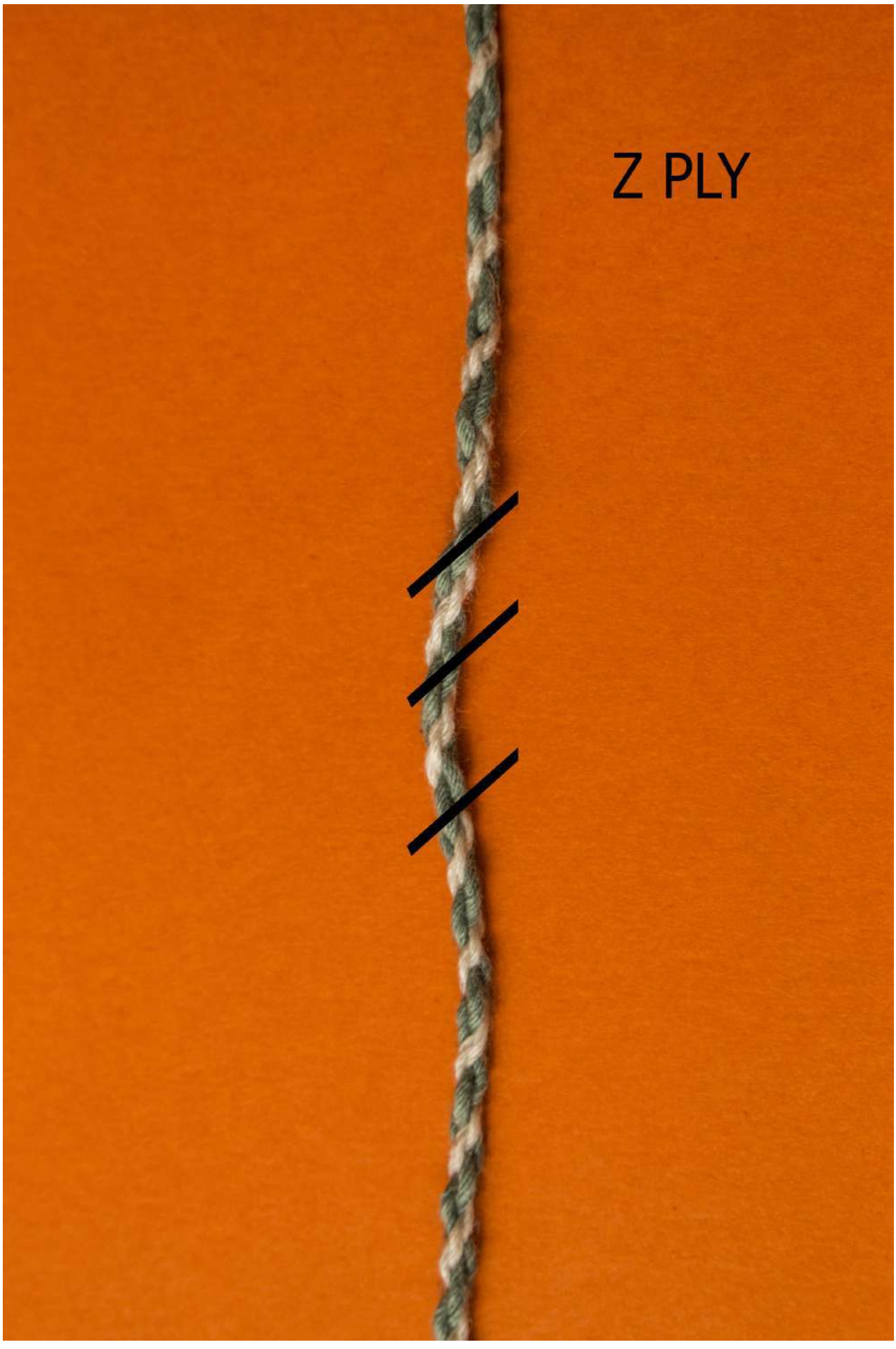
B - BRAID CORD STRUCTURE

*It would be necessary to consider that the braid cord structure would be atypical or found in very rare cases. They could correspond to quipus of modern manufacturing for the most part.

W - WRAPPED CORD



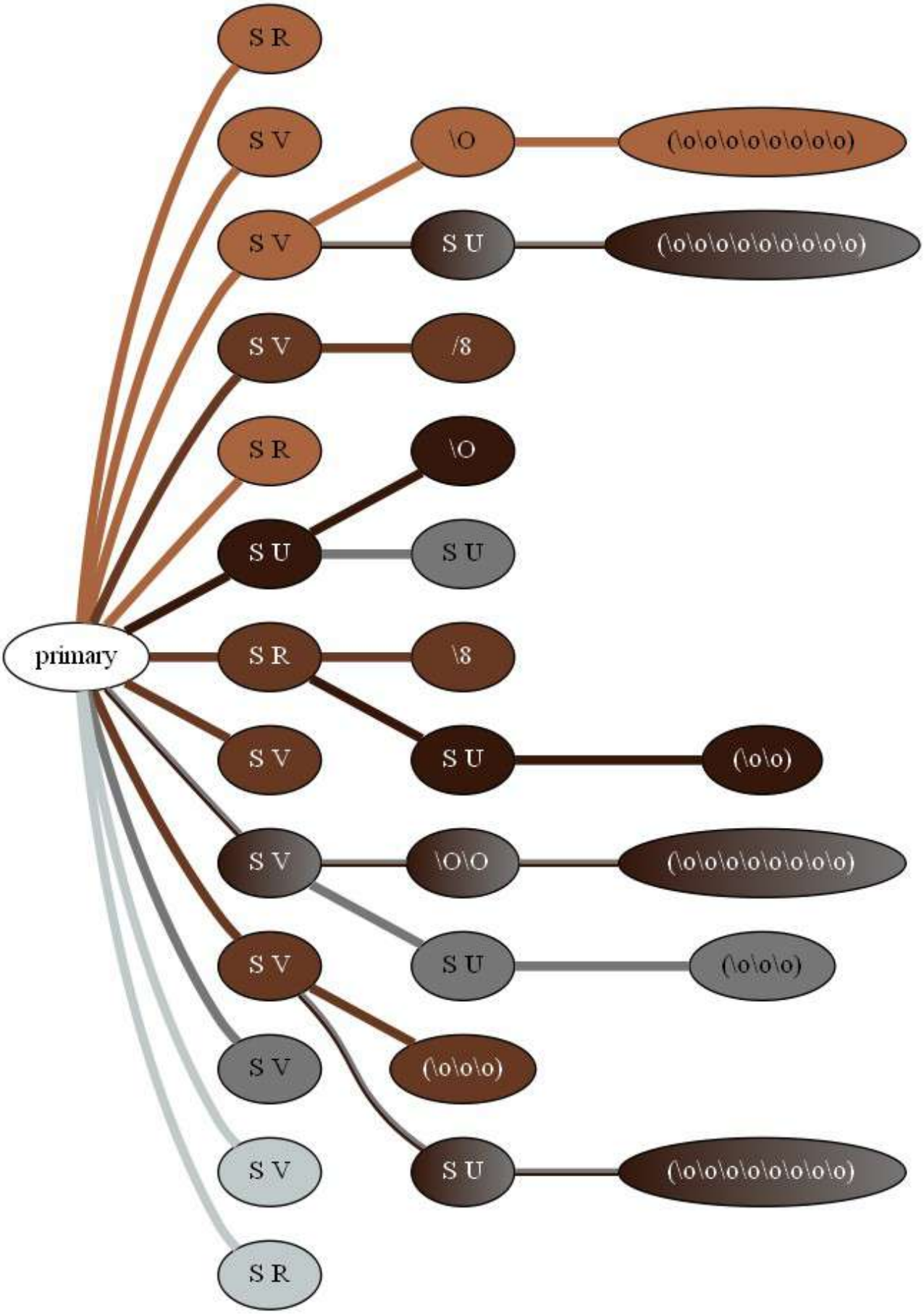

S PLY


Z PLY

S STYLE LONG KNOT

Z STYLE LONG KNOT

Example of Graphics generated by PixelQuipu program by D. Griffiths that reads data from The Khipu Database http://kairotic.org/pixel-quipu/



From table UR019.xls.png

KDB data as of 11/22/2004 01:46 PM

KHIPU UR019 / 1000000
Museum Name: Centro Mallqui, Leymebamba, Amazonas
Museum Number: CMA-480/LC1-109.3
Nickname: none

Provenance: Leymebamba
Region: Chachapoyas
Archive: 100 - Leymebamba
Museum Description: Khipu de algodon

Primary Cord

Total Length: 26 cm Beginning: K - knotted Termination: K - knotted
Color: W
Final Twist: S Thickness: no information Fiber: CN - cotton
Notes:

0.5 cm group of	3 pendant(s)	(1 - 3)	space of	1.0 cm
2.5 cm group of	4 pendant(s)	(4 - 7)	space of	1.0 cm
4.5 cm group of	5 pendant(s)	(8 - 12)	space of	2.0 cm
7.5 cm group of	1 pendant(s)	(13 - 13)	space of	18.5 cm

KDB data as of 11/22/2004 01:46 PM

KHIPU UR019 / 1000000

Cord Number	Ply	Attch	Knots	Length	Term	Thkns	Color	Value	Alt. Values	Subs Pos	Notes
1	S	R		0.5	B		AB				
2	S	V		16.0	B		AB				
3	S	V	1S(10.5/Z) 8L(20.0/Z)	32.0	K		AB	18		5.0 - 5.0:1	
3s1	S	U	9L(13.5/Z)	31.0	U		KB:W	9			
4	S	V	1E(20.0/S)	39.5	U		MB	1			
5	S	R		21.0	B		AB				
6	S	U	1S(9.5/Z)	31.0	U		KB	10		2.0 - 2.0:1	*
6s1	S	U		32.0	U		W				*
7	S	R	1E(12.0/Z)	18.5	U		MB	1		4.0 - 4.0:1	
7s1	S	U	2L(8.0/Z)	13.0	U		KB	2			
8	S	V		40.0	K		MB				
9	S	V	2S(9.0/Z) 8L(17.0/Z)	24.0	U		KB:W	28		4.5 - 4.5:1	
9s1	S	U	3L(11.5/Z)	17.0	K		W	3			
10	S	V	3L(11.5/Z)	33.0	K		MB	3		2.0 - 2.0:1	
10s1	S	U	8L(15.5/Z)	35.0	U		KB:W	8			
11	S	V		49.5	K		W				
12	S	V		29.0	K		BL				
13	S	R		36.0	U		BL				

Notes and Obeservations for Khipu UR019 / 1000000

6 doblado en cordon principal
6s1 nudo desanudado