

*Indigenous Record-Keeping and Hacienda Culture:  
Modern Khipu Accounting on the Island of the Sun*

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I. Introduction:

How did khipus, the knotted cords that encoded numerical as well as narrative information, continue to function within the bureaucratic economic systems of the post-colonial Andes? Although best known as the primary method by which the Inka Empire (c. 1400-1532 AD) registered administrative data, khipu use continued throughout the Spanish colonial era and into the 19th and 20th centuries.<sup>1</sup> Recent studies have noted the co-existence of

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<sup>1</sup> Martti Pärssinen and Jukka Kiviharju. *Textos andinos: corpus de textos khipu incaicos y coloniales*. Vol. 1. (Instituto Iberoamericano de Finlandia, Universidad Complutense de Madrid, 2004); Galen Brokaw, *A History of the Khipu*. (Cambridge UK: Cambridge University Press, 2010); Marco Curatola Petrocchi, Marco and José Carlos de la Puente Luna. *El quipu colonial: estudios y materiales*. (Lima, Fondo Editorial, 2013); José Carlos de la Puente Luna. "That Which Belongs to All: Khipus, Community and Indigenous Legal Activism in the Early Colonial Andes", *The Americas*. 72:1 (2015) 19-54.

kipus with Spanish alphabetic texts in the early Spanish colonial period; for example, Kathryn Burns has examined how alphabetically literate Andeans served as scribes and notaries in the Cuzco region alongside local experts who were skilled in khipu record-keeping. Under legislation introduced by the Viceroy Francisco de Toledo (1569-1581), village notaries were required to transfer economic information from khipus -- such as livestock inventories -- into written documents, implying the ongoing presence of khipu experts in local communities.<sup>2</sup> Alan Durston has theorized that the continuation of khipu records was one of the primary reasons why the Andes never developed a colonial tradition of "mundane" Quechua literacy comparable to the extensive native language notarial and legal documents found throughout Mesoamerica.<sup>3</sup>

Although it is known that the use of khipus continued into the Republican eras in both Peru and Bolivia, few studies of modern khipus have analysed how khipu cords have been integrated with the institutions of the modern nation state. That is, although ethnographers, such as Carol Mackey,

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<sup>2</sup> Kathryn Burns. "Making Indigenous Archives: The Quilcacamayoc of Colonial Cuzco", *Hispanic American Historical Review*. 91:4, (2011) 676.

<sup>3</sup> Alan Durston. "Native-Language Literacy in Colonial Peru: The Question of Mundan Quechua Writing Revisited", *Hispanic American Historical Review*. 88:1 (2008), 41-70.

have described how contemporary khipus encoded data, hardly any scholars have focused on how khipu literacy interacted with Republican economic systems, such as the hacienda.<sup>4</sup> Modern khipus often are considered to have sprung from an ahistorical "Andean ontology", as a form of indigenous media that existed in isolation from the modern world. A notable exception to this tendency to view 20th century khipus outside of their larger economic context, however, can be found in the work of anthropologist Frank Salomon. His research in the Central Peruvian villages of San Andrés de Tupicocha and San Cristóbal de Rapaz has carefully analysed how the patrimonial khipus preserved in these two communities play a vital role in village political and economic life, complimenting the local archives of written documents.<sup>5</sup>

This article examines a set of five ethnographic khipus created in the Yumani hacienda on the Island of the Sun in Lake Titicaca, Bolivia, between 1948 and 1949. A Jesuit priest, Antonio Sempere, donated them to the

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<sup>4</sup> See Carol Mackey. "The Continuing Khipu Tradition: Principles and Practices", in *Narrative Threads: Accounting and Recounting in Andean Khipu*. Jeffrey Quilter and Gary Urton, eds. (Austin, University of Texas Press, 2002), 321-347.

<sup>5</sup> Frank Salomon, *The Cord Keepers: Khipus and Cultural Life in a Peruvian Village*. (Durham, Duke University Press 2004); Frank Salomon, *At the Mountain's Altar: Anthropology of Religion in an Andean Community*, (NY, Routledge/Taylor and Francis, 2017).

Smithsonian Museum in 1955, along with brief notes explaining the significance of the knots and the general structure. The Island of the Sun khipus encode information about local crop production, and actually contain pieces of dried produce -- freeze dried potatoes and a dried fava bean pod -- tied onto them. These are the first khipus known to display agricultural products as inclusions attached to the cords. A comparison of their structure with that of other ethnographic khipus demonstrates that these Island of Sun khipus represent sub-types previously unknown in the Lake Titicaca islands. Most importantly, our analysis allows us to identify two distinct and non-overlapping zones of khipu types on the Island of the Sun. Early ethnographies and archival research reveal that these contrasting khipu zones developed out of the distinctive histories and cultural practices of the island's two haciendas.

This study contributes to and draws from the field of "New Accounting Studies" which has transformed accounting history in recent decades.<sup>6</sup> The

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<sup>6</sup> Eugenio Piñero, "The Cacao economy of the eighteenth century province of Caracas and the Spanish Cacao Market", *Hispanic American Historical Review*, 68, no. 1 (1988), 75-100; Peter Miller, Trevor Hopper and Richard Laughlin, "The New Accounting History: An Introduction", *Accounting, Organizations and Society*, 16, nos. 5-6(1991), 395-403; Ross Stewart, "Pluralizing our Past: Foucault in Accounting History", *Accounting, Auditing and Accountability*

"New Accounting" is characterised by a diversity of research methodologies as well as a focus on how local accounting practices result from particular historical circumstances. A pervasive theme has been the relationship of accounting to political power, and how accounting practices respond to and shape structures of inequality. The ethnographic khipus from the Island of the Sun demonstrate that, prior to the implementation of Bolivia's Agrarian Reform Law in 1953, a close relationship existed between khipu forms and the haciendas where the cords were utilized at the behest of the owner. Herding and crop khipus did not arise simply out of a generalised and collective Andean consciousness, but can be shown to be the products of specific histories and economic activities.

## II. Modern Ethnographic Khipus

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*Journal*, 5, no. 2(1992), 57-73; Anthony Hopwood and Peter Miller, *Accounting as Social and Institutional Practice*. (Cambridge UK, Cambridge University Press, 1994); D. Neu, "'Presents for the Indians': land, colonialism and accounting in Canada. *Accounting, Organizations and Society*, 25, no. 2 (2000), 163-84; Gary Urton, *Inka History in Knots: Reading Khipus as Primary Sources*. (Austin, University of Texas Press, 2017).

In the 1890s German anthropologist Max Uhle began to study the khipus that he found in use on Bolivian haciendas.<sup>7</sup> In 1895 Uhle questioned the herder responsible for livestock on the Cutusuma hacienda, located in the La Paz department, about the knotted cords that he made to keep track of the herds; Uhle published the first ethnographic account of modern khipu usage based on this interview. Andean hacienda workers had created khipu accounts of the haciendas' agricultural production since the Spanish colonial period. For example, court testimony from 1614 reveals that indigenous stewards ("*mayordomos*") on the Cusco hacienda of Juan Francisco Maldonado made khipus for recording the maize, beans, potatoes, vegetables, and salt produced by the estate for each of the previous ten years.<sup>8</sup> Lucila Castro de Trelles has documented how Andean workers used khipus to record

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<sup>7</sup> Max Uhle, 1897. "A Modern Kipu from Cutusuma, Bolivia". *Bulletin of the Free Museum of Science and Art* 1, no. 2 (1897), 51-63; Carmen Beatriz Loza, "El modelo de Max Uhle para el estudio de los quipus, in: *Max Uhle y el Perú antiguo*. Peter Kaulicke, ed. (Lima, PUCP, 2001), 123-158; Hyland, "Ply, Markedness, and Redundancy".

<sup>8</sup> Donato Amado Gonzales, "Los quipucamayos contadores de hacienda y de los mitayos de plaza y de tambos del Cuzco", in: *El Quipu colonial: Estudios y materiales*. Ed by Marco Curatola Petrocchi and José Carlos de la Puente Luna, (Lima, PUCP, 2013), 307-324.

information on the cattle, sheep, and horses belonging to the hacienda of Tulpo in Huamachuco, Peru in the 17th century.<sup>9</sup> Brokaw has argued that similar produce and herding khipus existed alongside other kinds of khipus, such as those for documenting ritual offerings, genealogies, and narrative histories, as far back as the Inka era.<sup>10</sup>

Subsequent research on ethnographic khipus in the first half of the 20th century focused primarily on herding khipus and, to a lesser extent, on khipus for recording produce.<sup>11</sup> Beginning in the 1980s, however,

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<sup>9</sup> Lucila Castro de Trelles, "Quipus coloniales para el conteo del ganado: el caso de la hacienda Tulpo", in: *El Quipu colonial: Estudios y materiales*. Ed by Marco Curatola Petrocchi and José Carlos de la Puente Luna, (Lima, PUCP, 2013), 349-377.

<sup>10</sup> Galen Brokaw, *A History of the Khipu*, (Cambridge UK, Cambridge University Press, 2010).

<sup>11</sup> Oscar Núñez del Prado, "El kipu moderno", *Tradición: Revista Peruana de Cultura* (Cusco), 1-2, no. 3-6 (1950); Froilán Soto Flores, "Los kipus modernos de la comunidad de Laramarca", *Revista del Museo Nacional (Lima)*, 19-20 (1950-1951), 299-306; Carol Mackey, "Nieves Yucra Huatta y la continuidad en la tradición del uso del quipu", in: *Quipu y yupana*, ed by Carol Mackey et al. (Lima, Consejo Nacional de Ciencia y Tecnología, 1990), 157-164; Mackey, "The Continuing Khipu Tradition".

anthropologists became aware of the existence of modern khipus that served non-agricultural functions, particularly in the Central Andes. Some of these, such as the funerary khipus of Cuspón that are placed on top of the deceased in the coffin and the yearly offering khipus in Rapaz, serve vital ritual functions.<sup>12</sup> In Mangas, hybrid texts known as khipu boards inscribed information about participation in village events, while in the Huarochiri communities of Tupicocha and Anchucaya, lineage ("*ayllu*") based khipus recorded communal labour and resources.<sup>13</sup> Further south in Bolivia, elderly

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<sup>12</sup> Arturo Ruiz Estrada, "Los quipus funerarios de Cuspón", *Boletín del Museo de Arqueología y Antropología de la Universidad NMSM*, 1, no. 8 (1988), 12-18; Molly Tun and Filomeno Zubieta Núñez, "Los Quipus funerarios y tributarios de Cuspón y Chiquián", *Arqueología y Sociedad*, 31 (2016), 403-421; Arturo Ruiz Estrada, *Los quipus de Rapaz*. (Huacho, Peru, Centro de Investigación de Ciencia y Tecnología de Huacho, Universidad Nacional, 1981); Salomon, *At the Mountain's Altar*; Sabine Hyland, "Festival Threads: Khipu Calendars and Mercedarian Missions in Rapaz, Peru (c1565-1825)", forthcoming, *Catholic Historical Review*.

<sup>13</sup> Román Robles Mendoza. "*Quipu y Masha en la Comunidad de Mangas*", (Lima, Thesis, University of San Marcos, 1982); Salomon, *The Cord Keepers*; Sabine Hyland, Gene A Ware and Madison Clark. "Knot Direction in a Khipu/Alphabetic Text from the Central Andes", *Latin American Antiquity*, 25:2



men have recreated models of the offering and genealogical khipus that they used long ago.<sup>14</sup>

Ethnographic research on modern khipus, therefore, has revealed that these objects were created for a wide variety of purposes. Nevertheless, the most common type of modern khipu remains the relatively simple cords that recorded data about livestock and crops. Carol Mackey, who conducted ethnographic research on khipus in the 1960s, created an influential typology of herding and produce khipus based on a survey of 43 known examples, 24 of which she herself had studied.<sup>15</sup> In her research, Mackey interviewed nineteen men and one woman about the khipus that they made. Most of

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(2014) 189-197; Sabine Hyland, Sarah Bennison, and William P Hyland, "Khipus, Khipu Boards and Sacred Texts: Toward a Philology of Andean Knotted Cords", *Latin American Research Review*, 56, no. 2 (2021); Sabine Hyland. "How Khipus Indicated Labour Contributions in an Andean Village: An Explanation of Seriation, Colour Banding and Ethnocategories", *Journal of Material Culture*, 21:4 (2016) 490-509.

<sup>14</sup> Nelson Pimentel, *Amarrando colores: La producción del sentido en khipus aymaras*, (La Paz, CEPA, Latinas Editores, 2005); Denise Arnold. *The Metamorphosis of Heads: Textual Struggles, Education, and Land in the Andes*. (Pittsburgh PA: The University of Pittsburgh Press, 2006).

<sup>15</sup> Mackey, "The Continuing Khipu Tradition".

these individuals worked on haciendas and had to show their khipus to the owner once a year in the annual accounting of their stewardship. However, a few, such as Nieves Yucra on the island of Taquile in Lake Titicaca, kept khipus to record their own personal goods.

Mackey divided livestock and harvest khipus into three categories based on their structure: A, B, and C. Type A, which "mimics standard Inca khipu in form", consists of a main horizontal or transverse cord from which hang pendant cords whose knots convey numbers.<sup>16</sup> In most of the examples, the top cord is free of knots, although three of the Type A khipus from Laramarca have knots in the top cord.<sup>17</sup> Type A khipus are found throughout

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<sup>16</sup> Mackey, "The Continuing Khipu Tradition", 327.

<sup>17</sup> Three herding khipus from Laramarca in the Central Andes, which Mackey classifies as B2 khipus, do not belong in this category. According to Soto Flores, who studied these khipus in the late 1940s, none of the cords on the Laramarca khipus are doubled to create a thicker region for knots. Instead, each khipu is made of a central cord onto which are tied two pendants in classic Type A fashion. A black hanging pendant stipulates male sheep, while its black subsidiary signifies male lambs; a white pendant represents ewes, while its white subsidiary records female lambs. Unlike most Type A khipus, however, knots are tied into the main cord on the Laramarca khipus.

the Andes from La Libertad in the north to Lake Titicaca in the south (Figure 1).



Figure 1. Modern Type A khipu from Cuzco, Peru, c. 1920. Private Collection. Photo by Sabine Hyland. Note the doubling of the main cord. (This khipu was not included in Mackey's survey.)

Mackey found that the least common category, Type C (9% of the sample), consists of a single cord with overhand knots. These knots are grouped along the cord into zones which determine their decimal value. For example, the first zone along the cord has knots that each indicates a value of one; then there is a space and the following zone has knots that each represents a value of ten, and so forth. One of the Type C khipus in her

collection came Northern Peru, while the remaining ones were from the Cusco Valley.

Type B, the most common form of herding and produce khipu in her sample, all come from the Cusco area, except for one from the Central Andes. Mackey divides Type B into two categories, B1 and B2, and further subdivides B1 into three groups: B1a, B1b, and B1c. The characteristic that unifies all Type B khipus, according to Mackey, is that they that "are formed by using one length of two ply yarn, which is then doubled. When the yarn is doubled, the thicker portion at the top, composed of four plies, is knotted. This leaves the bottom portion as two loose pendant cords of two plies each", one of which is intentionally made longer than the other (Figure 2).<sup>18</sup>

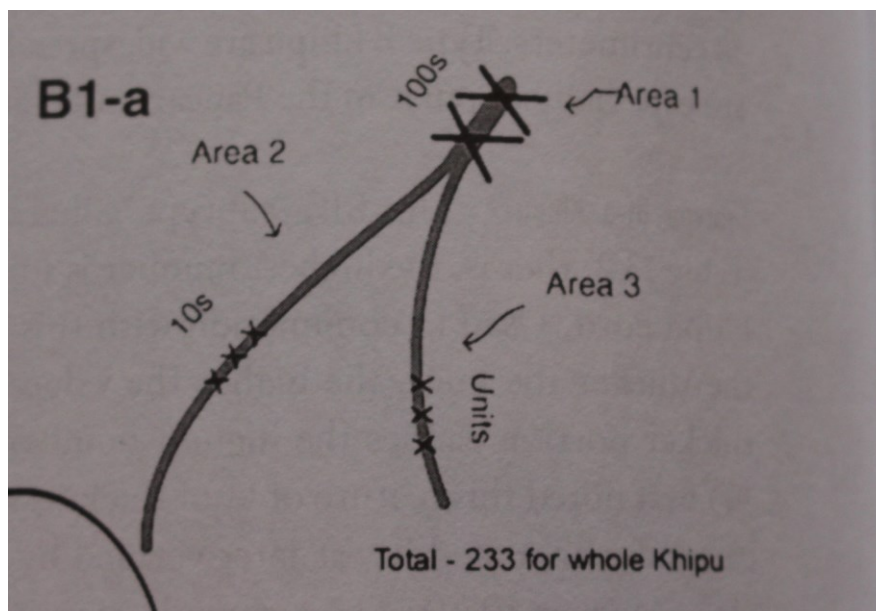


Figure 2. Type B1a khipu. Mackey, "The Continuing Khipu Tradition", 330.

<sup>18</sup> Mackey, "The Continuing Khipu Tradition", 330.

All B1 khipus have the same shape; they differ only in the values assigned to the knots on the various parts of the khipu. The overriding principle in B1 khipus is that knots made in the doubled portion have a higher value than knots in the single cords. So in B1a khipus, each knot in the thick doubled portion equals one hundred; each knot on the longer of the loose cords equals ten; and each knot on the shorter of the loose cords equals one (Figure 2). In B1b khipus, each knot in the hefty doubled portion equals 1000, each knot on the longer of the loose cords equals 100, while the shorter cord is divided into two zones, one for tens and one for single units. In B1c types, in contrast, the longer cord has zones for 100s and 10s, while knots on the shorter cord each signify one. All of the B1 khipus in Mackey's sample come from the Cusco region.

Mackey states that all fourteen of the B2 exemplars were formed by tying two B1 khipus together with a piece of string. She illustrates her discussion of the B2 type with a khipu for counting llamas near Cusco.<sup>19</sup> Except for a single khipu from the Central Andes, every one of the B2 khipus in her sample were acquired in the Cusco area.

The Cutusuma khipu, collected by Max Uhle near Lake Titicaca in 1895, is listed as B2, but does not fit her description of two B1 khipus tied together. Rather, the Cutusuma khipu was created by doubling an S plied string to form

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<sup>19</sup> Mackey, "The Continuing Khipu Tradition", 334-335.

a handle from which protrudes a cord of equal length on either side (see Figure 3). The S plied cord to the right indicates males, while the cord to the left, which is picked apart to reveal two Z plies, indicates female sheep. Unlike Mackey's B variants, there are no knots on the doubled portion of the string, which serves as a handle. Instead, the cord on either side is picked apart into smaller plies halfway down. Knots on the thicker portion of the cord on each side indicate 100, while the thinner sections have knots indicating either 10s or 1s. Pendant cords, which convey information about lambs and milking cows, hang down from the top cord. On the Cutusuma khipu, ply direction and knot direction play key roles in signifying meaning.<sup>20</sup> In 1842, the Swiss ethnographer and natural scientist, Johan von Tschudi, observed that Andean herding khipus routinely encoded information "by some peculiarity in the twisting of the string".<sup>21</sup> It is unknown whether the other khipus in Mackey's sample used ply direction to indicate meaning.

While the Cutusuma khipu does bear a doubled length of yarn, as in the other B Types, this functions as a top cord to which pendants are attached in the manner of Type A khipus. The knots that the top cord bears are similar to those on the Type A Laramarca khipus. The Cutusuma khipu appears to be

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<sup>20</sup> Hyland, "Ply, Markedness, and Redundancy".

<sup>21</sup> J J von Tschudi, *Travels in Peru during the years 1838-1842*. (New York, Putnam, 1825), 345.

a variant of Type A with the Type B characteristic that knots of different thickness indicate distinct decimal values. Mackey based her assessment of the Cutusuma khipu on Uhle's schematic diagram instead of the actual cords, which resulted in her misunderstanding of the structure.

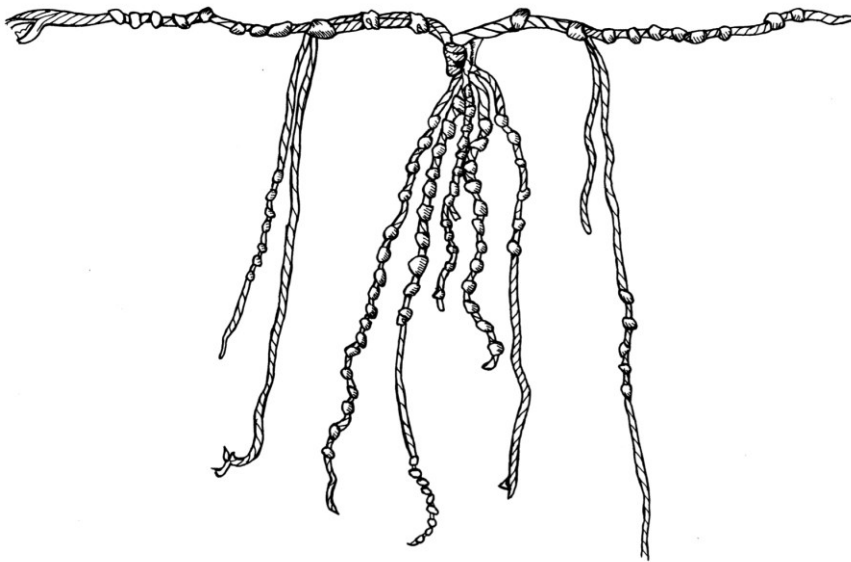


Figure 3. Cutusuma khipu, #36392, University of Pennsylvania Museum of Archaeology and Anthropology. Drawn by Sabine Hyland.

Mackey's pioneering analysis reveals the geographic reach of the three kinds of herding and produce khipus she identified. Inka style Type A khipus are found throughout the Peruvian and Bolivian Andes. Type B1 and B2 khipus are found exclusively in the Cusco area, except for one khipu that Mackey collected in the Central Andes. Finally, the single cord Type C khipus

pertain exclusively to the Cusco region, except for one exemplar from a hacienda in Northern Peru. All of the khipus from Lake Titicaca, either from the island of Taquile, or the lakeside area of Puno, are Type A or, in the case of Cutusuma, a modified Type A khipu.<sup>22</sup>

The association between Lake Titicaca and Type A khipus is supported by Uhle's research on the Island of the Sun. In his 1894-1895 field expedition to Bolivia, he acquired khipus from the Challa hacienda on the Island of the Sun, in addition to the khipu he collected in Cutusuma.<sup>23</sup> The Challa khipus, which were not part of Mackey's survey, are exclusively Type A khipus (Figure 4). The first khipu contains knots on the top cord, similar to the Laramarca and Cutusuma cords, while the second possesses a classic Type A Inka style structure:

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<sup>22</sup> Mackey, "The Continuing Khipu Tradition", 328-329; for Taquile, see Mackey, "Nieves Yucra Huatta" and Rita Prochaska, *Taquile y sus tejidos*. (Lima, Arius SA, 1990).

<sup>23</sup> Loza, "El modelo de Max Uhle", 125.



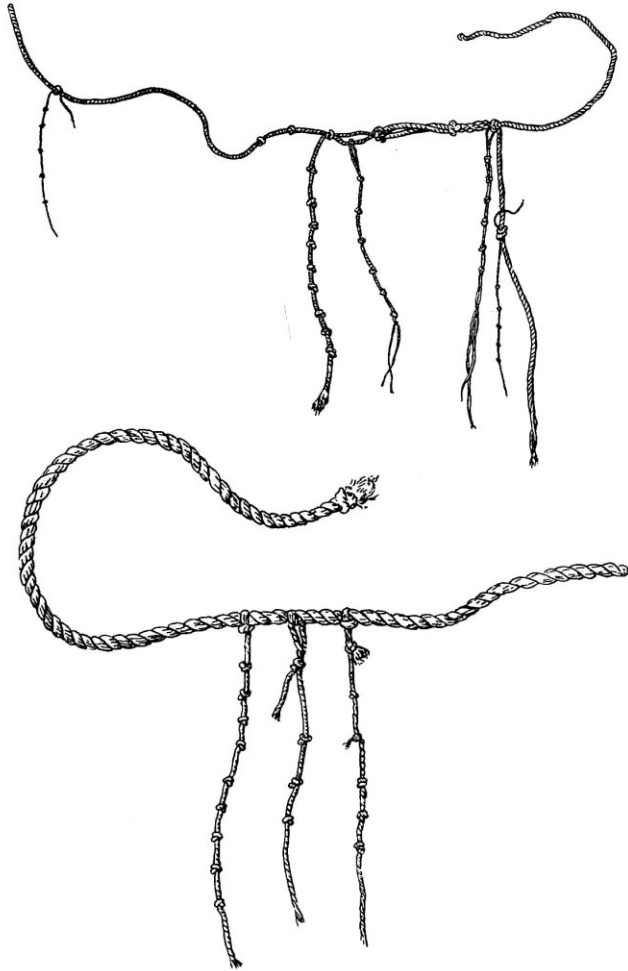


Figure 4. Type A khipus from the Challa hacienda on the Island of the Sun, 1895. Loza, "El modelo de Max Uhle", 139.

Given the predominance of Type A khipus in the Lake Titicaca region, from Puno, to Taquile Island, to the Challa hacienda on the Island of the Sun, one would expect the khipus from the Yumani hacienda -- the only other estate on the Island of the Sun -- to share this form. Yet, as shown below, the khipus collected by Father Sempere have a completely different logic and structure.

### III. The Yumani Khipus

In 1955 the Jesuit priest Antonio Sempere donated to the Smithsonian Museum five ethnographic khipus that he had collected from the Yumani hacienda on the Island of the Sun in Lake Titicaca in 1949. Father Sempere was the Director and founder of a Natural History Museum at the Jesuit high school in La Paz, the Colegio San Calixto. The five khipus had been on display in the San Calixto museum with "many quipus or cords with various knots, the accounting system of the ancient Indians, and that is still used today on the Island of the Sun"<sup>24</sup> In addition to khipus, the Ethnological and Archaeological section of the museum exhibited sixty skulls from pre-Hispanic burials, ceramics from the Island of the Sun, stone arrowheads, pictorial catechisms on

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<sup>24</sup> "*Muchos quippus o cuerdas con diversos nudos, sistema de contabilidad de los antiguos indios, y que aún hoy se usa en la Isla del Sol*". The Smithsonian's accession materials include an essay by Father Sempere about his museum.

He explained that he created the museum in 1933 (when he arrived in Bolivia from Italy) so that the collection would augment the school's science classes. Antonio Sempere, "Un Colegio Paceño: Algo sobre la actividad cultural de 'San Calixto'", *Cordillera*, no. 1 (1956), 109-111, Smithsonian National Museum of the American Indian, papers relating to donations by Antonio Sempere. For khipus in private Peruvian museums in the 19th and 20th centuries, see Stefanie Gänger, *Relics of the Past: The Collecting and Study of Pre-Columbian Antiquities in Peru and Chile, 1837-1911*. (Oxford University Press, 2014).

leather hides, bows and arrows from the Amazon, and other assorted objects. It is likely that the Vatican Exposition of world culture in 1925, which displayed a khipu from the archaeological site of Pachacamac, and which later became the Vatican's Missionary Ethnological Museum,<sup>25</sup> inspired the ethnological section of the San Calixto museum. Sempere also organised sections on zoology, minerology, and paleontology, demonstrating the Catholic Church's commitment to the scientific education of Catholic youth.<sup>26</sup>

On October 10, 1955, the priest sent the five khipus, an ear tally,<sup>27</sup> and three modified skulls from an ancient burial tomb near Oruru, to the

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<sup>25</sup> Katherine Aigner and Nicola Mapelli. *The Americas: Collections from the Vatican Ethnology Museum*. (Edizioni Musei Vaticani, 2015).

<sup>26</sup> In 2015 the authors examined a 19th century khipu board in Ayacucho's Ministry of Culture storehouse. There is no documentation for this object, but one Ministry worker remembered seeing it in the one room "museo de cultura" in a local Catholic high school in the 1960s. One wonders how common such Catholic high school museums were in the Andes. See Hyland, Bennison, and Hyland, "Khipus, Khipu Boards, and Sacred Texts", Figure 4.

<sup>27</sup> A single cord containing 26 ear tips from the llamas, sheep, and vicuñas belonging to the hacienda owner, Mrs. De Perrin. The tips were cut from the animals' ears during the annual marking ceremony. The following year, the previous year's ear tips were examined to foretell the herd's fortunes. If the

Smithsonian Museum through the auspices of the American embassy in La Paz. Dr. Thomas Hart, the Chief of the U.S. embassy's educational mission, oversaw the exchange, in which the Smithsonian curators agreed in turn to send books and other printed material to the embassy for the library of the National Industrial School in La Paz.<sup>28</sup> Later that same month, the American public affairs officer in Bolivia, Charles Harner, explained to a visiting US Congressional delegation the reason for the embassy's promotion of such cultural exchanges between the US and Bolivia. According to Harner, "one of the problems that faces us here is the fact that there has been Marxist ideology among many leaders in the labor movement. That ideology is something which the US information service here has as one of its goals of correcting". Harner then described the embassy's efforts to host cultural events in La Paz to show that "America was much more than a materialistic

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ears were whole and unblemished, it indicated a good year; if they were worm-eaten, it meant a bad year. Jorge A. Lira, "Puhllay, fiesta india", *Perú Indígena*, 4:9 (1953), 125-134; Penelope Z. Dransart, *Earth, Water, Fleece and Fabric: An Ethnography and Archaeology of Andean Camelid Herding*. London: Routledge (2002) 82-94.

<sup>28</sup> Thomas A. Hart, "Letter to Dr. Clifford Evans", 18 October, 1955.

Smithsonian National Museum of the American Indian, papers relating to donations by Antonio Sempere.

nation, had a lot of art and culture".<sup>29</sup> Hewson Ryan, the Cultural Affairs officer, echoed these sentiments: "[T]he longstanding and deep infiltration of the Marxist thought pattern in intellectual and labor circles here ... is our biggest problem". Ryan presented a long list of educational and cultural programmes that the embassy had created to counter Marxist critiques of the United States.<sup>30</sup> Thomas Hart likewise provided the delegation with an impressive series of educational initiatives that he had overseen, including the creation of the National Industrial School.<sup>31</sup> Hart appears to have been the primary mover in acquiring the khipus for the Smithsonian in return for the museum's gift of books for the National Industrial School; the Smithsonian's acquisition of the khipus clearly grew out of America's Cold War strategy of sponsoring cultural exchanges to combat Marxism in Bolivia.

Father Sempere composed two explanatory notes to accompany the khipus that he sent sent to the Smithsonian. The first described a Type C khipu with zones for three different crops (Figure 5): "Triple khipu. The white potato in the middle is called '*thunta*,' which is the ordinary type [of potato],

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<sup>29</sup> United States Congress, House Committee on Government Operations.

*United States Technical Assistance and Related Activities in Latin America.* (US Government Printing Office, 1956), pp. 385-386.

<sup>30</sup> Congress, *United States Technical Assistance*, pp. 386-388.

<sup>31</sup> Congress, *United States Technical Assistance*, pp. 406-409.

which they freeze, leaving it in water for a week or more out in the open.

*'Quippus triple. La patata blanca del medio se llama Thunta, que es la ordinaria, pero que se la hace helar, teniendola en agua durante una semana o mas, a la intemperie'".* This khipu contained three counts, one for each type of crop that was tied onto the cord. In addition to the white freeze-dried potato in the middle, there is a piece of black freeze-dried potato on one end, and an unknown crop (probably freeze dried oca) that has come loose from the other end.



Figure 5. Type C khipu from the Yumani hacienda. #E554322-0, Smithsonian National Museum of the American Indian. Photo by Christine Lee.

At the turn of the century, freeze-dried potatoes, known as chuño, were commonly made on the Island of the Sun, with white chuño undergoing a different processing than black chuño: "For the common or black chunu, small

and indifferent-looking potatoes are selected; for the white or "tunta," white potatoes with thin skins are set apart. In case of the common chunu, the potatoes are crushed; but in making the tunta the potatoes remain entire. Both kinds are first thoroughly soaked and the black chunu remains in pools of standing water for a long time.... They are next spread out to freeze, and when thoroughly frozen, crushed to express every drop of liquid, and then dried. The white tunta, as stated, is not crushed, and furthermore it is washed in running water".<sup>32</sup> As this description indicates, unlike the black chuñu which is made from poorer quality potatoes, white chuñu is made from specially selected potatoes and is more highly valued, especially when the resulting chuñu is large, perfectly white, and without cracks. Indeed, the specimen held in by khipu A is beautiful—even after seventy years, it remains white and whole and without cracks—indicative of the high quality of chuñu which was represented on this khipu.

Although the Yumani khipus are unique in having actual potatoes tied onto them, other kinds of inclusions are found occasionally in both pre-

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<sup>32</sup> Elayne Zorn and Sue Leslie Lieberman, "Freeze-dried but always peeled: anthropological approaches to food processing preparation, and consumption of the Andean potato", in: *Proceedings of the Conference on "Indigenous Knowledges: Transforming the Academy"*, (State College, University of Pennsylvania State Press, 2004).

Hispanic and modern khipus. For example, a khipu from a Peruvian mummy acquired by the Italian researcher, Ernesto Mazzei, contains tufts of raw vicuña fiber tied onto the pendants (Florence Ethnological Museum #3887).

Inclusions of raw wool, leather tags, and even cloth figurines occur on the Rapaz khipus of Central Peru.<sup>33</sup> A khipu made in the village of Anchucaya in the 1930s has a rectangular white cloth with two circles drawn on it tied onto a pendant. This inclusion represents the stamped paper for official documents that lineage ("*ayllu*") members had to buy; the particular khipu pendant recorded the purchase of this paper.<sup>34</sup> Such objects are rare, however, and the inclusion of agricultural products is unprecedented in either the ethnographic or archaeological record.

Father Sempere's second note referred to the remaining four khipus, exemplified by this fava bean and potato khipu (Figure 6): "The big knots are worth ten, the smaller ones are worth one. When there are two threads, the longer one signifies what is produced; the shorter one, the amount sold. Generally they tie the related product at the end; and sometimes they put two [crops] on the same cord, but it is as if they were two separate accounts. These khipus are from the Island of the Sun from 1948 and 1949. *"Los nudos gruesos valen 10 (diez), los delgados valen 1 (uno). Cuando hay dos hileras, la*

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<sup>33</sup> Salomon, *At The Mountain's Altar*.

<sup>34</sup> Hyland, "How Khipus Indicated Labour".



*mayor significa lo producido; la menor, la cantidad vendida. Generalmente se ata al final el producto de que se trata; y a veces se ponen dos en la misma cuerda, pero es como si fueron dos cuentas aparte. Estos quippus son de la Isla del Sol de los años 1948 y 1949".*



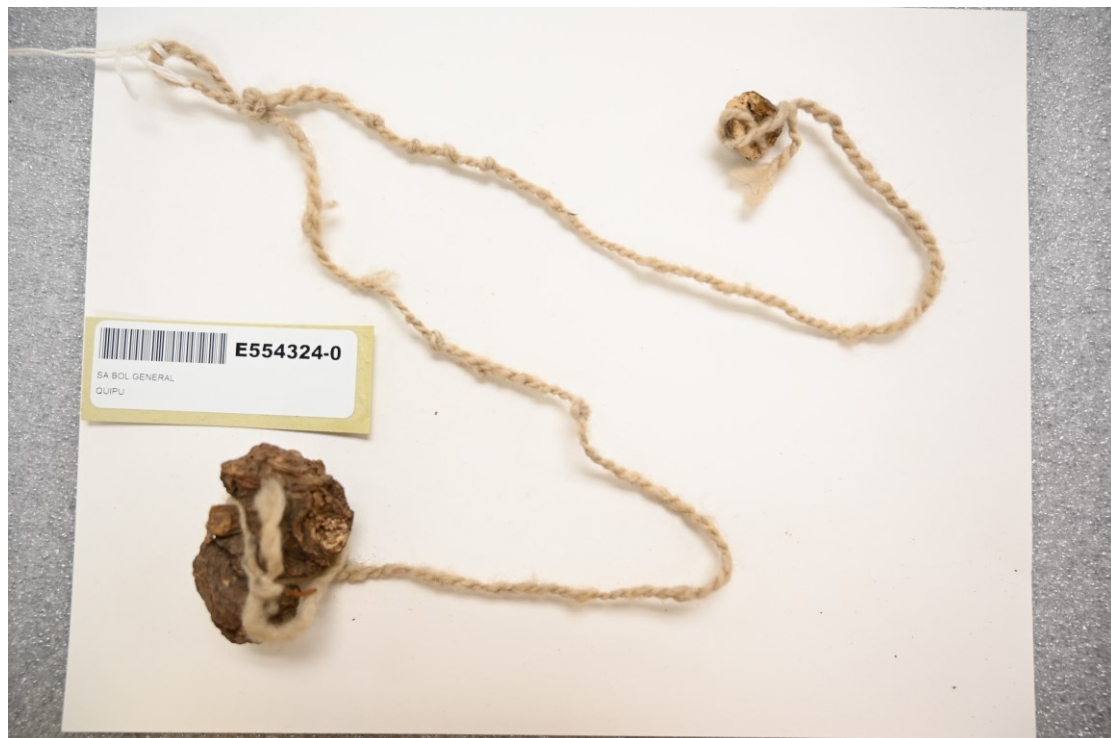
Figure 6. Type B fava bean and potato khipu from the Yumani hacienda.

#E554323-0, Smithsonian National Museum of the American Indian. Photo by Christine Lee.

Khipu E554323-0 is comprised of a length of doubled wool cord with a loop in the middle. The longer of the two ends has a small piece of white chuño attached, which is associated with seven large knots and three small

knots, indicating that seventy-three units of chuño were produced. The shorter cord with a fava bean pod cord has four small knots, revealing that 4 units of beans were sold. Both plants were among the few crops grown on the island, according to Bandelier.<sup>35</sup>

This fava bean and potato khipu is a variant of Mackey's Type B1 category, as are the remaining three khipus in the set. For example, E554324-0 which contains two pieces of what appears to be black chuño, indicating fourteen units produced and two units sold, is also a Type B1 (Figure 7).



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<sup>35</sup> Adolph Bandelier. 1910. *The Islands of Titicaca and Koati*, (New York, The Hispanic Society of America, 1910), 87.

Figure 7. Type B Yumani khipu with what appears to be two pieces of black chuño, E554324-0, Smithsonian National Museum of the American Indian.

Photo by Christine Lee.

These final four khipus are comprised of a doubled cord of yarn, with knots valuing ten in the thickened part, and knots equalling one in each of the thinner strands. The pieces of agricultural produce tied to the cords represent a unique addition to the B1 type. The triple khipu with the dried white potato in the middle clearly pertains to Type C. Neither of these types has been previously described for the Lake Titicaca region. The data clearly demonstrates that Andean workers on the two haciendas maintained separate styles of making khipus to record the production and sale of freeze-dried potatoes and other crops.

It is remarkable that the indigenous workers on the Island of the Sun's only two haciendas should maintain completely different khipu styles. One would expect that native communities on a small island would have influenced each other's way of recording information. An examination of the specific histories of the two haciendas, along with their economic and social interactions explains how such distinctive styles were maintained side by side with no evidence of intermixing, providing insights into how ethnographic khipu styles were transmitted in the modern era.

#### IV. The Challa and Yumani haciendas

The Island of the Sun (also known as Titicaca Island) lies in the southern portion of Lake Titicaca within Bolivian jurisdiction. According to legend, the Sun arose for the first time from a rocky escarpment on the island. During the Inka era, a major pilgrimage shrine dedicated to the Sun dominated the landscape.<sup>36</sup> Today the island is a popular tourist destination, famed as the birthplace of the Inkas, with hostels, restaurants and tourist shops supplying much of the islanders' income.

Only five and a half square miles in area, its hilly and rocky terrain poses a challenge to agriculture. Until the advent of tourism in the late 20th century, the primary crops cultivated on the island were potato, oca, fava beans, quinoa, and maize. "Originally the whole island was the property of the Garcés family of Puno", Bandlier wrote, referring to the city of Puno on the Peruvian side of the lake.<sup>37</sup> During their annual visits to the island, the Garcés family resided in Challa. In the late 19th century, the Guarachi family from La Paz, Bolivia, purchased the Yumani estate in the island's southernmost part.

The indigenous people on the Challa estate belonged to the kinship group of "Aran-saya" centred in the peninsula of Copacabana with branches throughout the mainland. Aran-saya was represented on the island by two

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<sup>36</sup> Brian Bauer and Charles Stanish, *Ritual and Pilgrimage in the Ancient Andes: The Islands of the Sun and the Moon*, (Austin, University of Texas Press, 2001).

<sup>37</sup> Bandelier, *The Islands of Titicaca and Koati*, 51.

groups, the Challa *ayllu* and the Kea *ayllu*.<sup>38</sup> Every year the Island of the Sun members of Aran-saya interacted with kin from around the lake during religious festivities; they also participated in informal trading networks. Prior to the Agrarian Reform Law of 1953, the workers on the Challa estate had to perform free labour service on the Garcés properties in Puno, and they travelled regularly between the island and the city. The Challa hacienda labourers, therefore, maintained close contact with native groups living along the mainland.

The Challa hacienda was overseen by two Aymara officers, the Ilacata ("*Jilaqata*") and the Alcalde. The former represented the administrative power; he distributed land annually, received the shares of crops owed to the landowner, and oversaw communal labour. The Alcalde, on the other hand, was the executive officer who rendered decisions over all cases of conflict.<sup>39</sup> Both of these individuals were obliged to create khipu records for the hacienda, maintaining a strict vigilance over the harvest and livestock accounts. Their responsibilities included keeping khipu accounts of the sale of agricultural products as well. When Uhle travelled to Challa in 1895, he interviewed the current Alcalde and Jilaqata, who explained to him how their

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<sup>38</sup> Bandelier, *The Islands of Titicaca and Koati*, 82.

<sup>39</sup> Bandelier, *The Islands of Titicaca and Koati*, 83.

accounting khipus functioned.<sup>40</sup> They refused to sell him their current 1895 khipus but, after much persuasion, grudgingly parted with their khipus for 1894 (see Figure 4). They were required to show their current khipus to the landowner as evidence of their stewardship and would have been severely punished if their records were incomplete or lacking.

In the 1940s when Father Sempere collected the five khipus, Alberto Perrin Pando, a Swiss-Bolivian scholar, owned the Yumani hacienda. Sempere's notes in the Smithsonian accession materials state that the accounting cords he acquired from the Island of the Sun were made for "Señora de Perrin" ("Mrs de Perrin"). Alberto Perrin's daughter, Carmen Perrin -- now an artist and sculptor living in Switzerland -- has identified "Mrs de Perrin" as her paternal grandmother, Leonor Pando de Perrin Guarachi, establishing that the khipus were made and used in Yumani.<sup>41</sup> Father Sempere and Alberto Perrin were colleagues and friends with similar interests in archaeology and ethnography. Perrin was keenly interested in indigenous Andean material culture, carrying out excavations of Inka artefacts on Yumani and directing films about Aymara life and culture on the Island. Both attended

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<sup>40</sup> Loza, "El modelo de Max Uhle", 136-138.

<sup>41</sup> Carmen Perrin, personal communication, 2019.

the First and Second Round Tables of Bolivian Archaeology, exclusive events where fewer than two dozen people were invited.<sup>42</sup>

Tracing the khipus to Yumani and to Alberto Perrin is key because through his lineage we can—for the first time—demonstrate a direct historical link between a set of modern ethnographic khipus and a known khipu archive from the past. Alberto Perrin had inherited Yumani from his mother, Leonor Pando de Perrin Guarachi.<sup>43</sup> Her parents had been in turn the former president of Bolivia, Jose Manuel Pando, and Carmen Guarachi Sinchi Roca. Carmen Guarachi descended from the famed Guarachi *kurakas* (native lords) of Jesús de Machaca.<sup>44</sup> They had been “one of the richest and most powerful noble families of the Collao region during the colonial period”, managing to retain

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<sup>42</sup> Ponce Sangínes, Carlos, "Información antropológica de Bolivia, 1953-54", *Boletín Bibliográfico de Antropología Americana* 17, no. 1 (1954), 89-96.

<sup>43</sup> Peter Schmid, *Beggars on Golden Stools: Report on Latin America*. Transl. Meryn Savill, (New York, Praeger, 1956).

<sup>44</sup> Pilar Mendieta, *Entre la alianza y la confrontación: Pablo Zárate Willka y la rebelión indígena de 1899 en Bolivia*, (Lima, Instituto Francés de Estudios Andinos, 2010).

much of their power and wealth even during periods when the influence of the Inka nobility had been in decline.<sup>45</sup>

This branch of the Guarachi family were descended from Juan Colque Guarachi —the “lord of the Quillacas”—whose life spanned the Spanish invasion and the decades following it.<sup>46</sup> He had been “much favoured by the Spanish”, and his father had been closely allied with the Inka ruling elite in Cusco; a hereditary lord from Qullasuyu, the southern part of the Inka empire, he had served on Manco Inca Yupanqui’s (the half-brother of Inka Emperor Atahuallpa) war council, and submitted to Pizarro alongside him.<sup>47</sup> In the 1570s, Juan Colque Guarachi produced a series of *probanzas de servicios y meritos* (“proofs of services and merits”) where he laid out his genealogy, going back three generations before the Spanish invasion. He explained that his paternal great-great-grandfather had been a kuraka named Colque, who

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<sup>45</sup> Elena Phipps, Johanna Hecht, and Cristina Esteras Martín, *The Colonial Andes: Tapestries and Silverwork, 1530–1830*, (New York, The Metropolitan Museum of Art, 2004), 365.

<sup>46</sup> Ximena Medinaceli, 2004. “La ambigüedad del discurso político de las autoridades étnicas en el siglo XVI. Una propuesta de lectura de la probanza de los Colque Guarachi de Quillacas”, *Revista Andina* 38 (2004). 87-104.

<sup>47</sup> Thomas Abercrombie, *Pathways of Memory and Power*, (Madison, University of Wisconsin Press, 1988), 149-153.



after allying himself with the Inka Emperor Pachacuti in Cusco was awarded the honorific title of Inca Colque. Inca Colque's son, Inca Guarache, was rewarded for services to the Inka state by the gift of three shirts—of silver, of gold, and of precious stones. Inca Guarache's son, Colque, served during Huayna Capac's reign; and Colque's son, Guarache, was Juan Colque Guarachi's own father.

Such probanzas were subjective documents which were designed to put their subjects in the best possible light; Juan Colque Guarachi's probanzas thus showed off his illustrious ancestors, framed in ways that were acceptable and comprehensible to Spanish courts. While the probanzas demonstrated his indisputable influence and prominence, they also revealed his fluency and investment in the Andean ways of knowing -- especially through textiles-- that were a key aspect of his authority. Not only did he employ highly skilled artisans to weave *cumbi* cloth —a type of fine cloth that was rich in Andean symbolism and iconography— for him throughout his life, but his probanzas seem to have been based on his own khipu records.<sup>48</sup>

His khipus were stored in his famous archive in southern Bolivia. Juan Colque Guarachi's home was renowned in the 16th century for housing a

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<sup>48</sup> Medinaceli, "La ambigüedad".

substantial and significant collection of manuscripts and khipus.<sup>49</sup> This khipu archive was so well established that the Jesuit chronicler Blas Valera cited them in his *Relación* as evidence for his accounts of pre-Columbian history.<sup>50</sup> Indeed, Valera credited Juan Colque Guarachi with an extensive knowledge of history which he attributed to his mastery of khipus and his khipu archive.<sup>51</sup> Among Juan Colque Guarachi's archive would undoubtedly have been herding and produce khipus, quite possibly of the same genre as these five khipus from his descendants' estate on the Island of the Sun. Such a direct historical link is evidence of the historical interrelatedness between ethnographic and colonial khipus, emphasizing the potential continuities in Andean accounting practices.<sup>52</sup> It is tempting to speculate that the five khipus created under the

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<sup>49</sup> Thierry Saignes, 1999. "The Colonial Condition in the Quechua-Aymara Heartland", in: F. Salomon and S. Schwartz, eds, *The Cambridge History of the Native Peoples of the Americas*, (Cambridge, Cambridge University Press, 1999) 59-137.

<sup>50</sup> Blas Valera, *An Account of the Ancient Customs of the Natives of Peru*, Translated and Introduction by Sabine Hyland, (State College, Pennsylvania State University Press, 2011 [1594]), 54.

<sup>51</sup> Medinaceli, "La ambigüedad", 98.

<sup>52</sup> For colonial khipus from non-hacienda settings, see Curatola and Puente *E/ quipu colonial*.

auspices of Juan Colque Guarachi's descendants may have similar forms to those that he himself employed to account for his harvests and flocks.

In the late 19th and early 20th centuries, the main properties of this branch of the Guarachi family could be found in La Paz and its environs.

While the workers on the Challa hacienda performed their forced unpaid labour as "*pongos*" in the city of Puno on the shores of Lake Titicaca, those from Yumani travelled to La Paz to serve as *pongos* for the Guarachis.<sup>53</sup>

Likewise, when Island of the Sun hacienda workers delivered their shares of the harvest to the landowners, those from Challa went to Puno, while laborers from Yumani went to La Paz. As Bandelier wrote, "What the hacienda of Challa gives to its owners is sometimes carried to Puno by balsas in a three day voyage; and what the Guarachi family needs at La Paz is taken to that city on pack animals from [Yumani by way of] Yampupata".<sup>54</sup> Members of each hacienda maintained a relatively segregated network of interactions; the men and women of Challa formed part of a lacustrine network with strong ties to Puno and other communities along the shore, while the people of Yumani were oriented toward the capital region of La Paz. This lack of integration seems to be reflected in the highly divergent khipu traditions found on each hacienda. The Challa khipus share the Type A structure found elsewhere in

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<sup>53</sup> Bandelier, *The Islands of Titicaca and Koati*, 87.

<sup>54</sup> Bandelier, *The Islands of Titicaca and Koati*, 52.

Puno and Lake Titicaca, while the Yumani khipus are of Types B and C, normally found in Cusco, although the latter occurs in the La Paz area as well.

During his ethnographic fieldwork in Bolivia, Bandelier spent much time at the Llujo hacienda outside of La Paz, where he observed the use of khipus: "For keeping their accounts with the hacienda, the Indians ... still use a simple "*quippu*" or knotted string.... We have seen the former in use at Llujo".<sup>55</sup>

Adolph Bandelier donated three khipus from Lujó to the American Museum of Natural History. All three of these (#SAT/1079a; SAT/1079b; SAT/1079c) clearly conform to Mackey's Type C. Although the Llujo exemplars lack pieces of produce tied into the cords, their general structure is the same as the thunta khipu from Yumani, underscoring the relationship between Yumani and the La Paz area.

The sharply demarcated range of the different types of khipus on the Island of the Sun indicates how closely the use of these objects was linked to the haciendas. Presumably both Type A and Type B khipus encode detailed information about flocks and produce equally well; the use of one or the other on the Island of the Sun appears to have been determined primarily by the ties between the workers and the hacienda whose crops they produced and whose flocks they herded. Prior to the Agrarian Reform Law, all land on the island was owned by one of the two haciendas. Access to farm land for the

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<sup>55</sup> Bandelier, *The Islands of Titicaca and Koati*, 89.

indigenous inhabitants came through a type of sharecropping arrangement with the hacienda owner. Every year each family received usufruct rights in a small plot of land; in exchange the workers farmed the owners' fields most days of the week, and provided other forms of unpaid labour including personal attendance at the house of the owner in Puno or La Paz and transporting the owners' goods.<sup>56</sup> Khipus mediated the unequal economic and social relationships between peasant and landowner on the Island of the Sun, serving as the essential and tangible memorials of each time peasants had to hand crops and livestock over to the hacendados.

Bolivia's Agrarian Reform Law of 1953 abolished forced peasant labour, mandated the redistribution of land, and ultimately led to the disappearance of the hacienda system.<sup>57</sup> On the Island of the Sun, Challa and Yumani have been transformed into independent Aymara villages with their own land base.<sup>58</sup> The use of khipus, which were associated with the peonage, was abandoned at the same time the two estates were dissolved, and are no

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<sup>56</sup> Bandelier, *The Islands of Titicaca and Koati*, 78-79.

<sup>57</sup> Nicole Fabricant, "Mapping a New Geography of Space and Power", *Bolivian Studies Journal*, 15-17 (2010), 114-149.

<sup>58</sup> Mario Murillo Aliaga, Ruth Bautista Durán, and Violeta Montellano Loredó, *Paisaje, Memoria y Nación Encarnada: Interacciones ch'xiis en la Isla del Sol*, (La Paz, Fundación PIEB, 2014).

longer in active use on the island. Mackey has noted that khipu usage has gradually disappeared since the agrarian land reforms abolished the hacienda systems in Peru and Bolivia;<sup>59</sup> the same appears to be true for the Island of the Sun, where khipus were intimately tied to the history and economic functions of the two haciendas. While the cessation of khipu production could be viewed nostalgically as a cultural loss, it is important to recognise that the islanders' abandonment of khipu making was the result of a new political and economic self-determination brought about by the dismantling of the haciendas.

## V. Conclusion

The Yumani khipus endured a remarkable journey through multiple epistemes before they landed in the collections storage unit of the Smithsonian Museum. From the smoke-filled homes of the hacienda's Aymara-speaking *mayordomos* in charge of crop harvesting and sales, to an elite high school in La Paz, where they formed part of an ethnographic and archaeological melange inspired by Pope Pius XII's missionary museum, and finally to the Smithsonian, through the intervention of US embassy officials intent on fighting Marxism by hosting cultural exchanges, these five objects have reflected a series of shifting meanings over time. Additionally, these

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<sup>59</sup> Mackey, "The Continuing Khipu Tradition", 322-324.

kipus, prepared by the hacienda workers for the Guarachi landowners, represent an indigenous record-keeping tradition with direct historical links to a renowned colonial khipu expert, Juan Colque Guarachi; Guarachi kept exactly the kinds of khipu accounts that Durston has suggested precluded the development of a "mundane literacy" in Quechua in the Andes.

Our analysis, which expands the corpus of ethnographic khipus, demonstrates the degree to which the circulation of khipu styles within the economic system on the Island of the Sun was linked to hacienda production. Prior to agrarian reform on the Island of the Sun, khipu styles adhered closely to the haciendas where they were created, underscoring the intimate relationship between these knotted cords and the institution of the hacienda, and demonstrating the historical and social factors that determined their stylistic distribution. The Yumani khipus reveal how an accounting system based on cords and knots, rather than ledgers and Arabic numerals, continued to serve as an integral part of hacienda economics well into the 20th century.

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Bibliography:

--Abercrombie, Thomas. 1998. *Pathways of Memory and Power*.

Madison: University of Wisconsin Press.

--Aigner, Katherine and Nicola Mapelli. 2015. *The Americas: Collections from the Vatican Ethnology Museum*. Vatican City: Edizioni Musei Vaticani.

--Arnold, Denise. 2006. *The Metamorphosis of Heads: Textual Struggles, Education, and Land in the Andes*. Pittsburgh PA: The University of Pittsburgh Press.

--Bandalier, Adolph. 1910. *The Islands of Titicaca and Koati*. New York: The Hispanic Society of America.

--Bauer, Brian and Charles Stanish. 2001. *Ritual and Pilgrimage in the Ancient Andes*. Austin: University of Texas Press.

--Brokaw, Galen. 2010. *A History of the Khipu*. Cambridge UK: Cambridge University Press.

--Burns, Kathryn. 2011. "Making Indigenous Archives: The Quilcacamayoc of Colonial Cuzco", *Hispanic American Historical Review*. 91:4, pp. 665-689.

--Castro de Trelles, Lucila. 2013. "Quipus coloniales para el conteo del ganado: el caso de la hacienda Tulpo". In: *El Quipu colonial: Estudios y materiales*. Ed by Marco Curatola Petrocchi and José Carlos de la Puente. Lima: PUCP, 349-377.



- Curatola Petrocchi, Marco and José Carlos de la Puente. 2013. *El quipu colonial: estudios y materiales*. Lima: Fondo Editorial.
- Dransart, Penelope Z. 2002. *Earth, Water, Fleece and Fabric: An Ethnography and Archaeology of Andean Camelid Herding*. London: Routledge.
- Durston, Alan. 2008. "Native-Language Literacy in Colonial Peru: The Question of Mundane Quechua Writing Revisited". *Hispanic American Historical Review*, 88:1, pp. 41-70.
- Fabricant, Nicole. 2010. "Mapping a New Geography of Space and Power", *Bolivian Studies Journal*, 15-17: 114-149.
- Gonzales, Donato Amado. 2013. "Los quipucamayos contadores de hacienda y de los mitayos de plaza y de tambos del Cuzco", In: *El Quipu colonial: Estudios y materiales*. Ed by Marco Curatola Petrocchi and José Carlos de la Puente. Lima: PUCP, 307-324.
- Gänger, Stefanie. 2014. *Relics of the Past: The Collecting and Study of Pre-Columbian Antiquities in Peru and Chile, 1837-1911*. Oxford: Oxford University Press.
- Hopwood, Anthony and Peter Miller. 1994. *Accounting as Social and Institutional Practice*. Cambridge UK: Cambridge University Press.
- Hyland, Sabine 2014. "Ply, Markedness, and Redundancy: New Evidence for How Andean Khipus Encoded Information". *American Anthropologist*. 116(3), 1-6.

--Hyland, Sabine. 2016. "How Khipus Indicated Labour Contributions in an Andean Village: An Explanation of Seriation, Colour Banding and Ethnocategories", *Journal of Material Culture*, 21(4): 490-509.

--Hyland, Sabine. Forthcoming. "Festival Threads: Khipu Calendars and Mercedarian Missions in Rapaz, Peru (c1565-1825)". *Catholic Historical Review*.

--Hyland, Sabine, Sarah Bennison, and William P Hyland. 2021. "Khipus, Khipu Boards and Sacred Texts: Toward a Philology of Andean Knotted Cords", *Latin American Research Review*, 56(2).

--Hyland, Sabine, Gene A Ware and Madison Clark. 2014. Knot Direction in a Khipu/Alphabetic Text from the Central Andes. *Latin American Antiquity*, 25(2): 189-197.

--Lira, Jorge A. 1953. "Puhllay, fiesta india", *Perú Indígena*, 4:9, 125-134

--Loza, Carmen Beatriz. 2001. "El modelo de Max Uhle para el estudio de los quipus". In: *Max Uhle y el Perú antiguo*. Peter Kaulicke, ed. Lima: PUCP, pp. 123-158.

--Mackey, Carol. 1990b. "Nieves Yucra Huatta y la continuidad en la tradición del uso del quipu", In: *Quipu y yupana*, ed by Carol Mackey et al. Lima: Consejo Nacional de Ciencia y Tecnología, pp. 157-164.

--Mackey, Carol. 2002. "The Continuing Khipu Tradition: Principles and Practices". In: *Narrative Threads: Accounting and Recounting in Andean*

*Khipu*. Jeffrey Quilter and Gary Urton, eds. Austin: University of Texas Press, pp. 321-347.

--Medinaceli, Ximena. 2004. "La ambigüedad del discurso político de las autoridades étnicas en el siglo XVI. Una propuesta de lectura de la probanza de los Colque Guarachi de Quillacas". *Revista Andina* 38: 87-104.

--Mendieta, Pilar. 2010. *Entre la alianza y la confrontación: Pablo Zárate Willka y la rebelión indígena de 1899 en Bolivia*. Lima: Instituto Francés de Estudios Andinos.

--Miller, Peter, Trevor Hopper and Richard Laughlin. 1991. "The New Accounting History", *Accounting, Organizations and Society*, 16 (5-6): 395-403.

--Murillo Aliaga, Mario, Ruth Bautista Durán, and Violeta Montellano Loredo. 2014. *Paisaje, Memoria y Nación Encarnada: Interacciones ch'xiis en la Isla del Sol*. La Paz, Fundación PIEB.

--Neu, D. 2000. "'Presents' for the 'Indians': land, colonialism and accounting in Canada. *Accounting, Organizations and Society*, 25 (2): 163-84.

--Núñez del Prado, Oscar. 1950. "El kipu moderno", *Tradición: Revista Peruana de Cultura* (Cusco), 1(2), no. 3-6.

--Pärssinen, Martti and Jukka Kiviharju. 2004. *Textos andinos: corpus de textos khipu incaicos y coloniales*. Vol. 1. Instituto Iberoamericano de Finlandia, Universidad Complutense de Madrid.

- , 2010. *Textos andinos: corpus de textos khipu incaicos y coloniales*. Vol. 2. Instituto Iberoamericano de Finlandia, Universidad Complutense de Madrid.
- Perrin, Carmen. 2019, Personal communication.
- Phipps, Elena, Johanna Hecht, and Cristina Esteras Martín. 2004. *The Colonial Andes: Tapestries and Silverwork, 1530–1830*. New York: The Metropolitan Museum of Art.
- Pimentel, Nelson. 2005. *Amarrando colores: La producción del sentido en khipus aymaras*. La Paz: CEPA, Latinas Editores.
- Piñero, Eugenio. 1988. "The Cacao economy of the eighteenth century province of Caracas and the Spanish Cacao Market", *Hispanic American Historical Review*, 68, 1, 75-100.
- Ponce Sangínes, Carlos. 1954. Información antropológica de Bolivia, 1953-54. *Boletín Bibliográfico de Antropología Americana* 17(1): 89-96.
- Prochaska, Rita. 1990. *Taquile y sus tejidos*. Lima: Arius, SA.
- Puente Luna, José Carlos de la. 2015. "That Which Belongs to All: Khipus, Community and Indigenous Legal Activism in the Early Colonial Andes", *The Americas*. 72:1, 19-54.
- Puente Luna, José Carlos de la. 2019. "Calendars in Knotted Cords: New Evidence on How Khipus Captured Time in Nineteenth Century Cuzco", *Ethnohistory*, 66(3): 437-464.

- Robles Mendoza, Román. 1982. "*Quipu y Masha en la Comunidad de Mangas*". Thesis, University of San Marcos: Lima.
- Ruiz Estrada, Arturo. 1981. *Los quipus de Rapaz*. Huacho, Peru: Centro de Investigación de Ciencia y Tecnología de Huacho, Universidad Nacional.
- Ruiz Estrada, Arturo 1988 . "Los quipus funerarios de Cuspón". *Boletín del Museo de Arqueología y Antropología de la Universidad NMSM*, 1(8): 12-18.
- Saignes, Thierry. 1999. "The Colonial Condition in the Quechua-Aymara Heartland", In: F. Salomon and S. Schwartzs, eds, *The Cambridge History of the Native Peoples of the Americas*, Cambridge: Cambridge University Press, 59-137.
- Salomon, Frank. 2004. *The Cord Keepers: Khipus and Cultural Life in a Peruvian Village*. Durham: Duke University Press.
- Salomon, Frank. 2017. *At the Mountain's Altar: Anthropology of Religion in an Andean Community*. Routledge/Taylor and Francis.
- Schmid, Peter. 1956. *Beggars on Golden Stools: Report on Latin America*. Transl. Meryn Savill. New York: Praeger.
- Sempere, Antonio. 1956. "Un Colegio Paceño: Algo sobre la actividad cultural de 'San Calixto'", *Cordillera*, no. 1, pp 109-111. Smithsonian National Museum of the American Indian, papers relating to donations by Antonio Sempere.

--Soto Flores, Froilán. 1950-1951. "Los kipus modernos de la comunidad de Laramarca", *Revista del Museo Nacional (Lima)*, 19-20: 299-306.

--Stewart, Ross. 1992. "Pluralizing our Past: Foucault in Accounting History", *Accounting, Auditing and Accountability Journal*, 5(2): 57-73.

--Tschudi, J J von. 1825. *Travels in Peru during the years 1838-1842*. Translated from the German by Thomasina Ross, New York: Putnam.

--Tun, Molly and Filomeno Zubieta Núñez. 2016. "Los Quipus funerarios y tributarios de Cuspón y Chiquián", *Arqueología y Sociedad*, 31: 403-421.

--Uhle, Max. 1897. "A Modern Kipu from Cutusuma, Bolivia". *Bulletin of the Free Museum of Science and Art* 1 (2): 51-63.

--United States Congress, House Committee on Government Operations. 1956. *United States Technical Assistance and Related Activities in Latin America*. Washington DC: US Government Printing Office.

--Urton, Gary. 2017. *Inka History in Knots: Reading Khipus as Primary Sources*. Austin: University of Texas Press.

--Valera, Blas. 2011 [1594]. *An Account of the Ancient Customs of the Natives of Peru*. Translated and Introduction by Sabine Hyland. State College PA: The Pennsylvania State University Press.

--Zorn, Elayne and Sue Leslie Lieberman. 2004. "Freeze-dried but always peeled: anthropological approaches to food processing preparation, and consumption of the Andean potato." In: *Proceedings of the Conference*

on *"Indigenous Knowledges: Transforming the Academy"*. State College:  
University of Pennsylvania State Press.