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A Modern Kipu from Cutusuma, Bolivia

By Dr. Max Uhle

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A MODERN KIPU FROM CUTUSUMA, BOLIVIA.

At the time I was making preparations for my travels in South America, I came across a passage in the works of the distinguished traveler, J. J. von Tschudi, in which he remarks that the kipu, that famous instrument which held so important a position in the days of the ancient civilizations of Peru, was still to be found in use among the Indians of Northern Bolivia and Southern Peru. It is to be regretted that so expert a traveler did not bring any of these modern kipus back to Europe. So many objects, remains of the civilization of the ancient Indians, have vanished since the time of the travels of Tschudi, that I had reason to fear that the use of the kipu might also have terminated. Fortunately, I found this was not the case. The kipu, indeed, survives in the interior of Peru and Bolivia, and this is not to be wondered at; where the Indians have not been taught reading and writing, an instrument for counting, that had proved so useful that an entire high civilization, that of the Incas, was based upon it, was not to be readily given up.

Being aware of the importance of this instrument as a medium of civilization, I missed no opportunity in Northern Bolivia of asking the people, Spanish as well as Indian, if they had any knowledge of the use of curious knotted strings for purposes of counting. Not discouraged by many negative replies, I succeeded at last in obtaining two modern representatives of the ancient kipus, the first at Challa, on the Island of Titicaca, which I sent directly to Professor Bastian, at Berlin, who esteemed it so highly that he was kind enough to publish an account of it, together with my notes, almost immediately (*Ethnologisches Notizblatt*, 1895, *Heft* 2, page 80, with plate III), and the second at Cutusuma[1], on the southeastern shore of the

[1] Manuel V. Ballivian, *Diccionario Geográfico de la República de Bolivia*, 1890, I p. 35.

Lake of Titicaca, not far from the road leading from Chililaya to Aigachi, about two leagues from the former village and about one league and a half from the latter.

The second of these kipus, which I handed to the Department of Archæology of the University of Pennsylvania, is the one which I intend making the special subject of the following pages, in which I shall at the same time present some further notes on the subject of the modern and ancient kipus. I propose, in this paper, to clear the question of the ancient kipus as far as is possible, principally for the purpose of opening a somewhat broader field for future inquiries.

I obtained my second kipu from a common Indian, during an excursion in April, 1895, together with the friendly corregidor of the village of Aigachi, to the other side of the hills separating the plain of Aigachi from a more eastern plain that stretches from the Lake of Titicaca far toward the south to the so-called "Alto de La Paz." Cutusuma is a small hacienda in that plain, distant only a few minutes from the shores of the lake. The Indian who gave me the kipu had been alcalde (a kind of officer among the Indians) during the year 1894. As alcalde he had been responsible for keeping in order the flocks of the farm, and at the end of the year of his office he was obliged to deliver to another Indian who succeeded him as alcalde, among other things, the command of all the sheep and shepherds of the farm. This was done in accordance with the numbers indicated by the kipu that he then held, and which he retained when we visited him. It is improbable that I should have succeeded in securing this interesting specimen, had it not been for the intervention of the corregidor, the authority of the village to which Cutusuma belonged. In a similar manner I obtained the first of my kipus at Challa, through the kind assistance of Sr. Machicado, the administrator of the farm. During my travels on the shores of the Lake of Titicaca I was promised several others, which, however, I did not receive. The wife of the sub-prefect of the province of Omasuyu, when I showed her the first I obtained, told me of more specialized forms that served for keeping harvest accounts on farms, and promised to procure me one. But she failed to obtain it. The

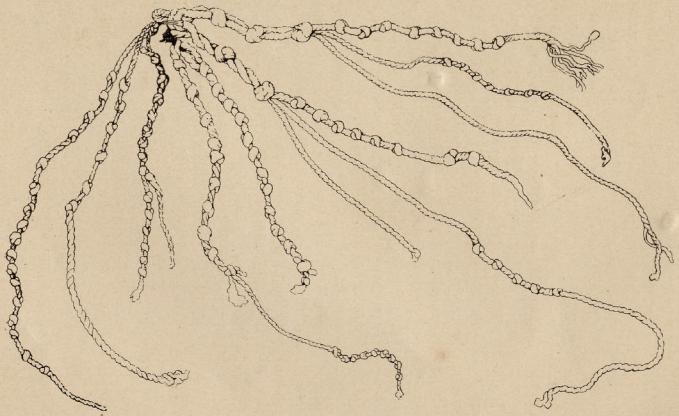

Plate 1. Kipu from Cutusuma, Bolivia. Museum of Science and Art, University of Pennsylvania, 36,392.

tenant of the hacienda of Chinchaya, which lies between Achacache and Ancoraimes in Omasuyu, was aware that one of his Indians preserved a kipu. The Indian, on being questioned, did not deny the fact, but, instead of delivering it for the money which we offered, returned later with the news that the rats had eaten it. Of course, this was an absurd excuse, but as the Indian was not willing to give up the kipu, it was impossible to force him. All of which goes to show that a traveler depends much upon the good-will of the Indians, and that many things are not obtained by a white man and a traveler simply because he is a white man and a foreigner. As such he is unable to surmount the instinctive distrust and mental opposition the Indian has for him.

The kipu of Cutusuma, Plate I, is not colored. It consists of white strings of sheep wool. Four divisions of strings are to be distinguished and in each of these, threads of different thicknesses and knots of different sizes are found together. There are strings of two threads, others, also, of four or six threads, and some formed by twisting together two parallel strings of the latter kind. By making knots in the strings of different thicknesses the knots become of different sizes, and so we find knots of three different kinds.

The system of reading or interpreting the kipu, is as follows :

Each division of strings represents a different kind of animals (the flocks of the farms are always of four kinds, consisting of ordinary female sheep, rams, lambs, and milking sheep).

"The number of female animals is always indicated on the border of the kipu, and that of the males in the centre" (information given by the Indian).

.The three kinds of knots express respectively, according to their size, hundreds, tens, and units.

With these facts in mind, we may proceed to read the kipu.

The alcalde of Cutusuma delivered at the close of the year 1894 to his successors :

387 sheep

285 rams

121+99 lambs. These are the lambs of the second and third

set of the year, the lambs of the first set having been joined as is the custom to the rams of the same year.

86+60+170 milking sheep (of the three sets of lambs for the year).

My two modern kipus answer the description of the ancient kipus as given by Inca Garcilaso.

These and others of which I heard were used, like a large part of the ancient ones, for the purpose of counting the harvest and other agricultural productions [1], and served especially for making annual accounts [2].

The distinction of different kinds of knots, expressing by their size, hundreds, tens, and units, and arranged in series so that the knots expressing the highest numbers are found uppermost, accords with what Garcilaso tells us of the ancient kipus [3].

A main string, to which the strings of the knots were attached, as Garcilaso describes of the ancient kipus, is also a feature of the tripartite modern kipu from Challa, now in the Berlin Museum.

The distinction of the counted objects by the colors of the strings expressive of them, as used in ancient times, is still in use in many places, as on the eastern side of the Lake of Titicaca, where yellow stands for barley and so forth. The memory of it also was still kept alive on the Island of Titicaca, although it had fallen into disuse there on account of lack of colored string among the Indians.

The objects on the uncolored ancient kipus were arranged ac-

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[1] Garcilaso de la Vega, *Comentarios Reales*, Pt. I, B. VI., Ch. 8.

[2] Garcilaso l. c.:—porque estas cuentas eran anales, y no daban razon mas que de un año solo.

[3] Garcilaso l. c.: Los nudos se daban por su orden de unidad, decena, centena, millar, decena de millar, y pocas veces ó nunca, pasaban a la centena de millar. . . . Estos numeros contaban por nudos dados en aquellos hilos, cada numero dividido del otro: empero los nudos de cada numero estaban dados todos juntos debajo de una vuelta, a manera de los nudos que se dan en el cordon del bienaventurado Patriarca San Francisco, y podiase hacer bien porque nunca pasaban de nueve como no pasan de nueve las unidades y decenas, etc.

cording to their values,[1] and the same applies to the modern ones.

The most conclusive evidence that the modern kipus are the direct descendants of the ancient ones lies in a significant peculiarity common to both. Garcilaso tells us that there were, in addition, certain strings attached to the main strings, which served no other purpose than to indicate certain exceptional numbers disturbing the final total of the main strings.[2] On the kipu from Challa (now in the Museum of Berlin) two separate strings attached to the main ones indicate the number of rams consumed in the kitchen of the owner of the hacienda on the one, and the other the number of sheep eaten by the shepherd himself. Both numbers are to be subtracted from the respective totals to which they are subordinate. The modern kipu from Challa thus serves to illustrate the detail related by Garcilaso of the ancient kipus, which otherwise, perhaps, would have been unintelligible.

The general analogy between my two modern kipus and the ancient specimens of our archæological museums[3] seems very clear.

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[1] Garcilaso l. c.: Las cosas que no tenian colores iban puestas por su orden empezando de las de mas calidad, y procediendo hasta las de menos, cada cosa en su genero, como en las miesses y legumbres. Pongamos por comparacion las de España, primero el trigo, luego la cebada, luego el garbanzo, haba, mijo, etc. Y asi tambien cuando daban cuenta de las armas, primero ponian las que tenian por mas nobles, como lanzas, y luego dardos, arcos y flechas, porras y hachas, hondas y las demas armas que tenian, etc.

[2] L. c.: Algunos destos hilos tenian otros hilitos delgados del mismo color como hiuelas, o eccepciones de aquellas reglas generales, como digamos en el hilo de los hombres o mugeres de tal edad, que se entendian ser casados, los hilitos significaban el numero de los viudos, o viudas que de aquella edad habia aquel año. . . .

[3] Some of the latter have already been reproduced in publications usually more for the sake of curiosity than with any intention of explaining them. J. J. v. Tschudi, *Peru, Reiseskizzen*, 1846, II p. 384, represents one of these. The same has been reproduced in Rivero y de Tschudi, *Antiguedades peruanas*, 1851, p. 106. Another, in the Museum of Berlin, was published in the *Archiv für Post und Telegraphie*, Berlin, Erg.-Heft, Sept. 1888, and this last gives us, up to the present time, the best idea of an ancient kipu. A drawing from this picture, evidently made without due appreciation of the significant details, is given by F. Ratzel, *History of Mankind*, translated by Butler, London, 1897,

If the description of the ancient kipus in the work of Garcilaso, the modern specimens and the ancient kipus of the museums are in perfect harmony, now that we have obtained the clue for understanding the modern ones, should it not be as easy to explain the ancient as the modern ones?

I venture to remark that the analogy between the existing ancient kipus and Garcilaso's description of them bears a still closer similarity than that between the latter and the modern examples. Garcilaso states that kipus of his time had the length of about a foot and a half. This, I believe, is generally the length of the ancient kipus, but the two modern ones obtained by me are much shorter.[1]

Garcilaso does not speak of different kinds of knots being found on different strings knotted together, but lets us understand that all the different kinds of knots existed on each single string, as is the case with the existing ancient specimens, but not on the modern ones.[2]

And, lastly, he makes mention of the knots being so well arranged on the strings that the knots of the same kind or equal denominations corresponded in their height with each

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II, 167. The one reproduced in Lord Kingsborough's *Antiquities of Mexico*, 1832, vol. IV, seems to be apochryphal, especially when we consider that the wooden box in which it was long preserved is not, as related, of pre-Spanish, but of later origin. A picture of the same kipu, taken from a work of Perez, was also reproduced by Andree in his article on knotted strings, *Ethnograph. Parallelen*, as well as in the Tenth Annual Report of the Bureau of Ethnology, 1888–89, Pl. XVI. The statement that this kipu was excavated and immediately drawn, is paralleled by so many similar statements on the part of owners of modern and forged objects that we are justified in forming our own conclusions. The method of its preservation, as described by Lord Kingsborough, favors rather than opposes its posthumous origin. The kipu represented by Mon. de Nadaillac in his work, *L'Amérique Préhistorique*, p. 459, cannot be brought into accordance with Garcilaso's description of the ancient kipus, and must, therefore, be likewise considered as doubtful.

[1] That of Challa has a length of about half a foot, that from Cutusuma is a little longer (about one foot in length).

[2] Though Cieza was perhaps acquainted with kipus of a similar ramification of the strings as the modern one from Cutusuma, Crónica, II p. 41: y en estos nudos contaban de una hasta diez, y de diez hasta ciento, y de ciento hasta mill y en uno destos ramales está la cuenta del uno, y en otro la del otro.

other on the different strings, "as a good accountant brings his figures under each other to make the total at the present day".[1]

This feature has evidently been lost in the modern kipus. We find on them no intentional parallelism of similar kinds of knots on the different strings. But on looking at the ancient kipu of the Berlin Museum, as reproduced in the *Archiv für Post und Telegraphie*, we recollect Garcilaso's nice description of the proper order of knots on the strings.

On the modern kipus the value of the different kinds of knots is shown by their different sizes, while on the ancient kipus this is indicated by the various heights of their position on the strings. If we look at the kipus as reproduced in the *Archiv für Post und Telegraphie*, we see that the knots crowded together in small series on higher portions of the strings represent a higher decimal system of figures than those at the lower end. The latter are of a different shape. They are formed by a number of spiral twists of the string, and are held together by the ends of the string passing through them in either way. Their general appearance is shown in Fig. II.

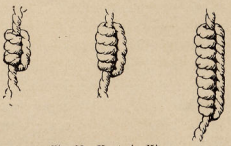

Fig. II. Knots in Kipus.

There is no doubt that they represent the smallest numbers in the decimal system of counting. Each special turn of the string apparently signifies a unit, and, although the number of the spiral twists varies greatly on the last knots of every string, the number of turns is, I believe, never more than nine. Mr. Frank H. Cushing observed the general resemblance that they bear to the hand, so frequently used for counting purposes, when closed, and I do not hesitate to refer to this comparison as an interesting idea.

But when we have arrived at a satisfactory understanding of

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[1] Los nudos de cada numero y de cada hilo, iban parejos unos con otros, ni mas ni menos que los pone un buen contador para hacer una suma grande.

the number as counted on the knots, we have not yet reached a complete comprehension of the kipus. Many of the ancient kipus were of the same kind as the kipu from Cutusuma, which, though readable enough as far as the arithmetical part was concerned, still required some information—perhaps a single word would have sufficed—to indicate the kind of objects to which it belonged. Without this it will be hopeless to arrive at a full understanding of them.

On the other hand, there were many kipus legible to everybody because their colors indicated the kind of objects to which they referred. We are told that in the empire of the Incas a class of learned men understood by help of the colors the interpretation of the kipus, as we understand the contents of books in the present day.[1] Many of the ancient kipus in the museums are colored. It must be admitted that we could understand their contents if we possessed a broader knowledge of the rules relating to the meanings of the colors. The acquisition of this must be our aim in the future.

The discovery of the color values in ancient times is to be obtained in two ways: first, by a careful study of the oldest works treating of the civilization of the Incas, as it is probable that we shall find passages explaining the value of the colors on the kipus, as for instance, Garcilaso tells us: white stands for silver, yellow for gold, and red for warriors. Professor Bastian has made some important citations[2] from the rare work of

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[1] Zárate, *Historia del descubrimiento*, 1557, I cap. 5: Assi se hallan las casas publicas llenas de estas cuerdas, las quales con gran facilidad da à entender el que las tiene à cargo, aunque sean de muchas edades, antes de èl.

[2] *Die Culturländer des Alten America*, 1889, III, p. 74:—Aora pues los que viesen este cordon de la mitad par abajo con hilos de tantos colores, nudos y nuditos, y la otra mitad antecedente con solo hilos pagiços y millares de nudos sin colores, dirian: Esta gente que avia antes deste Rey Mancocapac no tenia Rey, pues no ay hilo carmesi, ni tenia señor, ni cabeça que los governase, pues no ay hilo morado, ni tenian policia, pues no hay torçales de diferentes colores, ni tenian guerra, pues no ay hilo colorado, ni se les dava del oro y plata, pues no hay hilo blanco, ni amarillo, ni tenian as (?) culto, adoracion, ni sacrificios, pues no hay torçal de azul, amarillo y blanco, barbaros eran antes que uviese Reyes.—Pondria el Quipucamayoc en esta forma los hilos y los nudos en un cordon negro, que significava el tiempo, muchos hilos pagiços, y millares de

Calancha and others in this respect, and in the same manner more will eventually be discovered. Mon. de Nadaillac mentions a kipu used during a revolution of the Indians near Valdivia in Chile, in 1792.[1] This notice, again, assists our knowledge of the significance of the colors, so that we may give the following small table of the value of the colors on the kipus as probably correct :

	Garellaso	First Citation given by Bastian	Second Citation	Third Citation	Araucanians according to Mon. de Nadaillac
White	Silver	Silver			Time (coming days)
Black			Time		Time (passed nights)
Yellow	Gold	Gold			
Red	Warriors	War			Persons invited to war*
Green				Killed in war	
Blue					Persons invited to war and refusing†
Carmine		The Inca	The Inca		
Brown		The Curaca			
Gray				Provinces	
Variegated		Government			
Twisted of blue, yellow, and white		Religion			

* The Pehuenches signify the amount of the blood-money by kipus and declare by the red color of the strings their resolution to take vengeance immediately, if the price is not paid. Pöppig, *Reisen in Chile* etc. 1835, I, 386.

† There are four threads which are blue on the modern kipu from Challa, two of which, perhaps by chance, are also those that indicate the exception from the main count.

nuditos sin color diferente, y en medio del un gran nudo, y atravesado un hilo de color carmesi finisimo, que este significava el Rey.—Para dezir que sujetó diez provincias, saldria deste nudo otro hilo pardo con diez hilos y en cada uno atado un hilo verde con los millares de Indios que murieron de los contrarios, los principes (?) los de sesenta años arriba.

[1] De Nadaillac, l. c. p. 459: Une grande révolte contre les Espagnols fut organisée en 1792. Elle avait été préparée, ainsi qu' on l' apprit plus tard, par des messagers portant un morceau de bois dans lequel étaient renfermés des fils, dont les extrémités formaient des franges rouges, noires, bleues ou blanches. Le fil noir portait quatre noeuds qui signifiaient que le messager était parti de Valdura, la résidence du chef de la conspiration, quatre jours

The second way in which we may hope to increase our knowledge of the values formerly set on the colors is by a closer study of the kipus now in use among the Indians.

We may suppose that they are in use throughout a large area in Northern Bolivia and Southern Perú (compare J. J. von Tschudi), Northern Perú and also perhaps in Ecuador.

I was informed by persons acquainted with the interior of Northern Perú, that in the elevated valleys of the mountains the Indian herdsmen make up their accounts by kipus very similar to those of ancient times. In Ecuador the use of kipus was in vogue in many parts of the mountains in the seventeenth century,[1] and it was also observed by the traveler Stevenson at Riobamba in 1823.[2] It is my opinion, that proof that it has since become obsolete is necessary. The use of the colors to indicate the kind of objects to which the kipus belong, survives in many parts of this large area, especially in Northern Bolivia and Northern Perú, as I myself verified. Though it is improbable that by the study of the modern kipus of these regions we shall be able to construct the whole system of the values assigned to the colors of the kipus by the ancient Indians—as they had to distinguish a greater variety of objects in their highly-developed civilization[3] than the poor Indians of to-day—

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aprés la pleine lune. Le fil blanc portait dix nœuds, ce qui voulait dire que la révolte éclaterait dix jours après l'arrivée de ce messager. La personne à qui le quipo était remis devait a son tour faire un noeud au fil rouge, s' il acceptait de se joindre aux conjurés, aux fils rouges et bleus, si au contraire il s'y refusait.

Instead of Valdura should be read Valdivia (Chile), because, according to the annals of the Virreys, there was no other rebellion in the year 1792 in Perú, except a rebellion of Araucanians in Valdivia.

[1] *Docum. inéditos de Indias*, IX, 378, 469, 471, 495.

[2] W. B. Stevenson, *Twenty Years' Residence in South America*, 1829, II, 269.

[3] Acosta, *Historia general y moral de las Indias*, 1590, VI cap. 8: Porque para diversos generos como de guerra, de gobierno, de tributos, de cerimonias, de tierras, habia diversos quipos o ramales. Y en cada manojo destos tantos nudos, y nudicos, y hilillos atados: unos colorados: otros verdes: otros azules: otros blancos: y finalmente tantas diferencias que asi como nosotros de veinte y cuatro letras guisandolas en diferentes maneras sacamos tanta infinidad de vocablos, asi estos de sus nudos, y colores sacaban inumerables significaciones de cosas.

no one can safely say that we shall not in time greatly increase our knowledge of the ancient values of the colors by a closer study of the existing kipus.

I do not deny that the explanation of the ancient kipus is one of the most difficult questions in Peruvian archæology and it is uncertain that we are likely to advance rapidly in this direction, but the matter is so important that we are not justified in neglecting the last opportunities of saving all possible knowledge of the ancient kipus, that will have disappeared when the light shed by modern schools shall have in time extinguished the simpler though effective means of ancient civilization.

It would serve to advance the question if museums that possess ancient kipus would publish them. We would then clearly see what details remain to be explained, and further inquiries could be proceeded with accordingly.