QUIPU AS66

Museum identification: No. 2a (O. Núñez del Prado, Cuzco, Peru)

Main cord: color MB:W

¢$ 2.5 cm: group of 1 pendant cord, top cord, 2 pendant cords (1, T1, 2-3), then space of 5.0 cm.

8.5 cm: group of 1 pendant cord, top cord, 4 pendant cords (4, T2, 5-8), then space of 2.0 cm.

11.5 cm: group of 2 pendant cords, top cord, 3 pendant cords (9-10, T3, 11-13), then space of 2.0 cm.

14.5 cm: group of 4 pendant cords, top cord, 2 pendant cords (14-17, T4, 18-19), then space of 2.0 cm.

18.0 cm: group of 1 pendant cord, top cord (20, T5), then space of 2.0 cm.

20.0 cm: top cord (T6), then space of 4.0 cm.

24.0 cm: group of 1 pendant cord, top cord (21, T7), then space of 3.5 cm.

28.0 cm: group of top cord, 3 pendant cords (T8, 22-24), then space of 1.0 cm.

29.5 cm: group of 4 pendant cords, top cord, 2 pendant cords (25-28, T9, 29-30), then space of 2.0 cm.

32.5 cm: group of 1 pendant cord, top cord, 4 pendant cords (31, T10, 32-35), then space of 1.5 cm.

35.0 cm: group of 4 pendant cords, top cord, 4 pendant cords (36-39, T11, 40-43), then space of 1.0 cm.

37.5 cm: group of 4 pendant cords, top cord, 4 pendant cords (44-47, T12, 48-51), then space of 1.0 cm.

40.0 cm: group of 4 pendant cords, top cord, 4 pendant cords (52-55, T13, 56-59), then space of 1.0 cm.

43.0 cm: group of 4 pendant cords, top cord, 4 pendant cords (60-63, T14, 64-67), then space of 1.0 cm.

45.5 cm: group of 4 pendant cords, top cord, 4 pendant cords (68-71, T15, 72-75), then space of 0.5 cm.

48.0 cm: group of 4 pendant cords, top cord, 4 pendant cords (76-79, T16, 80-83), then space of 0.5 cm.

50.5 cm: group of 4 pendant cords, top cord, 4 pendant cords (84-87, T17, 88-91), then space of 1.5 cm.

54.0 cm: group of 8 pendant cords tied with top cord (92-99, T18), then space of 0.5 cm.

55.5 cm: group of 8 pendant cords tied with top cord (100-107, T19), then space of 1.0 cm.

58.0 cm: group of 4 pendant cords, (top cord), 4 pendant cords (108-111, T20, 112-115), then space of 2.0 cm.

62.0 cm: group of 8 pendant cords tied with top cord (116-123, T21), then space of 0.5 cm.

64.0 cm: group of 8 pendant cords tied with top cord (124-131, T22), then space of 1.5 cm.

67.0 cm: group of 8 pendant cords tied with top cord (132-139, T23), then space of 1.0 cm.

69.0 cm: group of 8 pendant cords tied with top cord (140-147, T24), then space of 53.5 cm.

124.0 cm: end ¢

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
1	6L(21.0)	58.0¢	W	6	
T1	--	1.0b	KB	?	
2	1s(5.0); 6s(16.0)	38.0¢	W	160	
3	1s(5.0); 1E(26.0)	37.5¢	W	101	
4	2s(11.0); 4L(21.0)	34.5¢	KB	24	
T2	1s(4.0); 9s(16.0); 2L(23.0)	27.0¢	KB	192	
5	2s(9.0); 4L(19.0)	37.0¢	KB	24	
6	2s(10.0); 4L(20.5)	38.5¢	KB	24	
7	2s(11.0); 4L(21.0)	40.5¢	KB	24	
8	2s(10.0); 4L(20.5)	39.0¢	KB	24	
9	2s(11.0); 4L(20.5)	39.5¢	W	24	
10	2s(11.0); 1s(21.0)	47.0¢	W	21	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
T3	1s(9.0); 7s(18.0)	31.5¢	KB	170	
11	1s(11.0); 6L(19.0)	39.0¢	W	16	
12	1s(10.5); 5L(19.0)	44.0b	W	15	
13	2s(11.0); 4L(19.0)	45.0¢	W	24	
14	9L(18.0)	37.0¢	W	9	
15	7s(20.5); 2L(27.5)	34.5¢	W	72	
16	9L(18.0)	38.0¢	W	9	
17	9L(17.0)	36.0¢	W	9	
T4	--	1.5b	KB	?	
18	6L(17.0)	33.0¢	W	6	
19	8L(16.5)	34.5¢	W	8	
20	1s(9.5); 6L(17.5)	33.0¢	W	16	
T5	1s(9.0)	9.0b	KB	(1+)?	
T6	3s(10.0)	12.5b	KB	3?	
21	8L(17.5)	33.0¢	MB	8	
T7	5s(10.0)	30.0¢	KB	50	
T8	--	0.5b	KB	?	
22	3L(18.5)	48.0¢	MB	3	
23	2L(19.0)	48.0¢	MB	2	
24	2L(18.0)	49.0¢	MB	2	
25	4s(8.0)	39.0¢	MB	40	
26	4s(7.0)	38.0¢	MB	40	
27	4s(7.5)	37.5¢	MB	40	
28	3s(7.0)	38.0¢	MB	30	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
T9	3s(3.0)	37.0¢	W	300	
29	4s(8.0)	38.0¢	MB	40	
30	4s(8.0)	38.0¢	MB	40	
31*	1s(6.5); 1E(18.5)	37.5¢	MB	11	
T10	1s(4.0); 1s(14.5)	36.5¢	KB	110	
32	1s(6.5); 3L(18.5)	34.5¢	MB	13	
33	1s(7.0); 7L(17.0)	26.0¢	MB	17	
34	8L(17.5)	28.5¢	MB	8	
35	1s(6.0); 7L(16.5)	31.0¢	MB	17	
36	--	5.0b	MB	?	
37	--	7.0b	MB	?	
38	--	6.0b	MB	?	
39	--	6.5b	MB	?	
T11	5s(15.0)	36.0¢	W	50	
40	6L(9.5)	31.5¢	MB	6	
41	7L(9.5)	32.5¢	MB	7	
42	6L(10.0)	31.0¢	MB	6	
43	6L(10.0)	30.0¢	MB	6	
44	6L(15.0)	47.0¢	MB	6	
45	6L(16.0)	42.0¢	MB	6	
46	7L(16.5)	44.5¢	MB	7	
47	6L(17.0)	45.0¢	MB	6	
T12*	--	0.5b	KB	?	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
48	6L(16.5)	43.0¢	MB	6	
49	6L(17.0)	47.0¢	MB	6	
50	7L(18.0)	34.0¢	MB	7	
51	6L(18.5)	33.5¢	MB	6	
52	1s(6.0); 5L(15.5)	25.5¢	MB	15	
53	1s(6.5); 5L(16.0)	33.5¢	MB	15	
54	1s(6.5); 5L(15.0)	30.0¢	MB	15	
55	6L(15.5)	25.5¢	MB	6	
T13	1s(4.0); 2L(17.0)	45.0¢	W	102	
56	1s(6.5); 3L(14.0)	23.0¢	MB	13	
57	1s(7.0); 3L(14.5)	28.0¢	MB	13	
58	1s(7.0); 2L(14.5)	24.5¢	MB	12	
59	1s(7.0); 3L(14.0)	26.0¢	MB	13	1:1.0
59s1	4s(7.5)	26.5¢	MB	40	
60	1s(7.0); 3L(15.5)	41.5¢	W	13	
61	1s(7.0); 3L(15.5)	41.5¢	W	13	
62	1s(7.0); 3L(15.5)	39.5¢	W	13	
63	1s(7.0); 1EE(15.5)	41.5¢	W	11	
T14	1s(3.5)	14.0b	KB	10?	
64	1s(7.5); 3L(13.5)	38.5¢	W	13	
65	1s(7.0); 2L(13.0)	39.0¢	W	12	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
66	1s(7.0); 3L(12.5)	32.5¢	W	13	
67	1s(7.0); 2L(13.0)	44.0¢	W	12	
68	1s(12.5); 3L(27.0)	46.0¢	W	13	
69	1s(12.0); 3L(26.0)	46.5¢	W	13	
70	1s(12.0); 3L(26.5)	45.0¢	W	13	
71	1s(12.0); 3L(25.0)	44.5¢	W	13	
T15	1s(3.0); 4L(21.0)	35.0¢	W	104	
72	1s(12.0); 3L(26.0)	47.0¢	W	13	
73	1s(11.5); 3L(25.5)	48.5¢	W	13	
74	1s(12.0); 3L(25.5)	46.5¢	W	13	
75	1s(12.5); 3L(23.5)	30.0¢	W	13	
76	7L(23.5)	43.5¢	W	7	
77	6L(22.5)	46.5¢	W	6	
78	6L(22.0)	46.0¢	W	6	
79	6L(21.0)	45.0¢	W	6	
T16	5s(12.0)	39.0¢	W	50	
80	7L(21.5)	37.5¢	MB	7	
81	6L(19.0)	36.0¢	MB	6	
82	6L(21.5)	35.5¢	MB	6	
83	6L(21.0)	38.5¢	MB	6	
84	2s(12.5); 8L(21.0)	34.0¢	MB	28	
85	2s(12.5); 8L(20.5)	33.0¢	MB	28	
86	2s(12.0); 9L(20.5)	32.5¢	MB	29	
87	1s(11.5); 5L(19.5)	41.5¢	MB	15	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
T17	2s(3.5)	48.5¢	MB	200	
88	2s(11.0); 5L(19.0)	37.0¢	MB	25	
89	2s(10.5); 5L(18.5)	36.5¢	MB	25	
90	2s(10.0); 5L(18.5)	36.5¢	MB	25	
91	2s(11.5); 5L(19.0)	37.0¢	MB	25	
92	4L(19.0)	40.0¢	KB	4	
93	4L(18.0)	41.0¢	MB	4	
94	4L(18.0)	40.0¢	MB	4	
95	4L(17.0)	38.0¢	MB	4	
96	4L(17.0)	38.0¢	MB	4	
97	4L(18.0)	38.0¢	MB	4	
98	4L(17.5)	38.5¢	MB	4	
99	4L(17.5)	39.0¢	MB	4	
T18	3s(10.0); 2L(17.0)	20.5¢	MB	32	
100	3s(10.5); 1E(19.5)	44.0¢	W	31	
101	3s(10.0); 1E(19.5)	44.0¢	W	31	
102	3s(10.0); 2L(19.5)	45.0¢	W	32	
103	1s(10.5); 8L(19.5)	39.5¢	W	18	
104	3s(10.5); 1E(19.0)	46.0¢	W	31	
105	3s(10.0); 1E(20.0)	45.0¢	W	31	
106	3s(10.5); 2L(22.0)	45.0¢	W	32	
107	3s(10.5); 1E(18.5)	40.5¢	W	31	
T19	2s(3.0; 3s(13.0); 7L(23.0)	29.0¢	MB	237	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
108	1s(11.0)	18.5b	MB	1?	
109	--	10.0b	MB	?	
110	1s(10.5); 4L(17.5)	29.5¢	MB	14	
111	1s(11.5); 2L(19.0)	33.0¢	MB	12	
T20	Missing				
112	1s(11.5); 3L(19.5)	34.5¢	W	13	
113	1s(11.0); 3L(19.0)	35.5¢	W	13	
114	1s(11.0); 4L(19.0)	19.5b	W	14	
115	1s(11.0); 2L(18.5)	29.0¢	W	12	
116	5L(18.0)	39.0¢	MB	5	
117	5L(17.5)	40.0¢	MB	5	
118	5L(17.5)	39.5¢	MB	5	
119	5L(17.0)	40.0¢	MB	5	
120	5L(18.5)	40.5¢	MB	5	
121	5L(18.5)	40.5	MB	5	
122	5L(17.5)	39.0¢	MB	5	
123	5L(17.0)	41.5¢	MB	5	
T21	4s(12.0)	27.5¢	MB	40	
124	2s(10.0); 5L(18.0)	37.0¢	MB	25	
125	2s(11.0); 5L(20.0)	39.0¢	MB	25	
126	3s(9.5); 1E(18.0)	38.0¢	MB	31	
127	1s(11.0); 9L(21.0)	34.0¢	MB	19	
128	2s(10.0); 5L(19.0)	36.0¢	MB	25	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
129	2s(10.0); 5L(18.0)	37.5¢	MB	25	
130	2s(11.0); 5L(19.0)	38.0¢	MB	25	
131	2s(10.0); 5L(18.5)	39.0¢	MB	25	
T22	2s(4.0)	38.0¢	KB	200	
132	6L(18.5)	40.0¢	KB	6	
133	6L(18.5)	40.5¢	KB	6	
134	7L(19.0)	42.0¢	KB	7	
135	6L(18.0)	37.5¢	KB	6	
136	6L(17.0)	47.0b	W	6	
137	6L(17.0)	46.0¢	W	6	
138	7L(16.0)	43.0¢	W	7	
139	6L(16.5)	44.5¢	W	6	
T23	5s(13.0)	22.0b	KB	50	
140	4L(16.0)	41.0¢	W	4	
141	4L(16.5)	46.5¢	W	4	
142	4L(16.5	47.0¢	W	4	
143	4L(16.0)	43.5¢	W	4	
144	4L(17.0)	46.5¢	W	4	
145	4L(15.0)	37.0¢	W	4	
146	4L(16.0)	46.0b	W	4	
147	4L(17.0)	47.0¢	W	5	
T24	3s(12.0); 2L(17.0)	22.0¢	W	32	

Observations

1. This quipu is associated with AS59-AS67. See discussion under AS59.

*2. From the discoloration of the main cord, and by extrapolation based on the spacing of the complete groups, we hypothesize that this quipu contained 24 groups of 8 pendants. Each of the groups had a top cord. Of the original 80 pendants of the first 10 groups, only 35 remain and so the first complete group starts with pendant 36. Of the last 14 groups, no pendants are missing.

3. Two loose broken cords were associated with this quipu: one, colored DB, had a value of 50; the other, colored AB, had a value of 14.

4. Both common forms of top cord attachment are present on this quipu. In groups 18, 19, and 21-24, the top cord unites the pendants. In the remaining groups, the top cord is attached to the main cord in the center of the group. The first pendant of the 18th group (P92) is a different color than the rest of the group reinforcing the idea that this is a place where a change occurs.

5. All pendant cords within a group are the same color with the exception of group 18 noted above and groups 16, 20, and 23 in which the first 4 pendants are one color and the last 4 another color. In 2 of these groups the top cord is the same color as the first 4 pendants in the group. The third group has the top cord missing so its color is unknown.

6. Only 6 groups have the top cord the same color as all the pendants in the group. Five of these groups are the only groups for which all pendants in the group have the same value.

7. The color of the top cords for groups 8-11 (BB, W, DB, W) are repeated for the next 4 groups (12-15).

8. With the exception of group 19, all groups that have all pendant values and top cord value present show the following relationship:

$$\sum_{j=1}^{4} P_{ij} = \sum_{j=5}^{8} P_{ij} = \frac{\text{top value}}{2} \qquad (i=13,15,16,17,18,21,22,23,24)$$

Where one of the three parts of the relationship is unknown due to breakage, the other two still appear:

$$\sum_{j=1}^{4} P_{ij} = \sum_{j=5}^{8} P_{ij} \qquad (i=12,14,17)$$

$$\sum_{j=1}^{4} P_{ij} = \frac{\text{top value}}{2} \qquad (i=9)$$

$$\sum_{j=5}^{8} P_{ij} = \frac{\text{top value}}{2} \qquad (i=2,10,11)$$

[Note: P_{ij} is the value of the j^{th} pendant in the i^{th} group.]

9. As noted in observation 6, five groups have all pendant values equal. The sum value on the top cord must, therefore, be a multiple of 8. In some cases where the top value is not a multiple of 8, the pendant values can be viewed as top value/8 rounded to the nearest integers. This is seen in groups 11,12,16,23 where the sums are 50. The pendant values are 6x6 + 2x7. Similarly in group 9, the pendant values can be viewed as rounded to the nearest multiple of 10. That is 150 = 3x40 + 1x30.

10. Groups 17 and 19 both have the same relationship among the first 4 pendants:

$$P_1=P_2=\frac{X}{4}+3 \qquad P_3=\frac{X}{4}+4 \qquad P_4=\frac{X}{4}-10$$

and as a result

$$P_1+P_2=\frac{X}{2}+6 \qquad P_3+P_4=\frac{X}{2}-6$$

For group 17, X=100 and for group 19, X=112.

Since group 19 is the only group for which $P_1+P_2+P_3+P_4 \neq P_5+P_6+P_7+P_8$, it is

interesting to note that also

$$P_1+P_2+P_3+P_4 = \left\lfloor \frac{\text{top value}}{2} \right\rfloor - 6$$

(rounded down)

$$P_5+P_6+P_7+P_8 = \left\lceil \frac{\text{top value}}{2} \right\rceil + 6$$

(rounded up)