

QUIPU AS131

Museum identification: VA42510 (Museum Für Völkerkunde, Berlin)

Main cord: color W

- \$ 41.5 cm: group of 10 pendant cords (1-10), then space of 1.0 cm.
- 44.5 cm: group of 2 pendant cords (11-12), then space of 1.0 cm.
- 46.0 cm: group of 10 pendant cords (13-22), then space of 1.0 cm.
- 49.0 cm: pendant cord (23), then space of 1.0 cm.
- 50.0 cm: group of 10 pendant cords (24-33), then space of 1.0 cm.
- 53.0 cm: pendant cord (34), then space of 1.5 cm.
- 54.5 cm: group of 10 pendant cords (35-44), then space of 0.5 cm.
- 57.0 cm: pendant cord (45), then space of 1.0 cm.
- 58.0 cm: group of 10 pendant cords (46-55), then space of 1.5 cm.
- 62.0 cm: group of 10 pendant cords (56-65), then space of 1.5 cm.
- 66.0 cm: group of 10 pendant cords (66-75), then space of 6.5 cm.
- 74.5 cm: group of 11 pendant cords (76-86), then space of 1.5 cm.
- 78.0 cm: group of 10 pendant cords (87-96), then space of 2.0 cm.
- 82.0 cm: group of 10 pendant cords (97-106), then space of 1.5 cm.
- 85.5 cm: group of 10 pendant cords (107-116), then space of 1.5 cm.
- 89.5 cm: group of 10 pendant cords (117-126), then space of 1.5 cm.
- 93.0 cm: group of 10 pendant cords (127-136), then space of 2.0 cm.
- 97.0 cm: group of 10 pendant cords (137-146), then space of 101.5 cm.
- 200.5 cm: end ϕ

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
1	4s(14.5); 4L(21.5)	41.0¢	W	44	1:1.0
1s1	--	52.5¢	R:NB	0	
2	3s(13.5); 8L(21.0)	41.5¢	W	38	1:1.0
2s1	--	50.5¢	R:NB	0	
3	3s(14.5); 3L(22.0)	57.0¢	W	33	1:1.0
3s1	3L(21.0)	50.5b	R:NB	3	
4	2s(15.5); 6L(22.5)	29.0b	W	26	1:1.0
4s1	9L(20.5)	43.0¢	R:NB	9	
5	1s(16.0); 8L(23.0)	59.5¢	W	18	1:1.0
5s1	--	12.5b	R:NB	?	
6	1s(16.5); 8L(24.0)	44.5	W	18	1:1.0
6s1	2s(15.0); 2L(22.0)	46.0b	R:NB	22	
7	--	25.0b	KB:NB	?	1:1.0
7s1	2L(24.5)	32.0b	R:NB	2	
8	1s(17.5); 3L(24.5)	54.0¢	NB:W	13	1:1.0
8s1	2s(16.5); 1E(23.5)	50.5¢	R:NB	21	
9	7L(24.5)	49.0¢	W	7	1:1.0
9s1	2s(17.0)	50.5¢	R:NB	20	
10	1s(9.0); 3s(14.0); 6L(20.5)	33.5¢	W	136	1:1.0
10s1	7s*	9.0b	R:NB	?	
11	3L(23.0)	48.5¢	NB:W/W (17.0/48.5)	3	1:1.0
11s1	2L(20.5)	46.5¢	DB:W/W (7.5/46.5)	2	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
12	8L(22.5)	44.0φ	NB:W/W (18.0/44.0)	8	1:1.0
12s1	2L(22.5)	55.5φ	DB:W/W (16.5/55.5)	2	
13	4s(15.5); 6L(21.5)	35.0φ	W	46	1:1.0
13s1	--	41.5	NB	0	
14	3s(16.0); 3L(23.0)	39.5φ	W	33	1:1.0
14s1	--	51.5φ	NB	0	
15	4s(16.5); 3L(23.5)	41.5φ	W	43	1:1.0
15s1	--	45.0φ	NB	0	
16	5s(16.5); 2L(23.0)	39.0φ	W	52	1:1.0
16s1	7L(21.5)	43.0φ	R:NB	7	
17	4s(16.0); 4L(22.5)	34.0φ	W	44	1:1.0
17s1	3s(14.0); 5L(20.0)	42.5φ	R:NB	35	
18	4s(16.5); 7L(24.0)	46.5φ	W	47	1:1.0
18s1	3s(15.0)	45.0φ	R:NB	30	
19	2s(16.0); 6L(24.0)	44.5φ	KB:NB	26	1:1.0
19s1	1E(22.5)	51.0φ	R:NB	1	
20	3s(16.5); 4L(22.5)	43.0φ	NB:W	34	1:1.0
20s1	2s(14.5); 5L(21.0)	40.5φ	R:NB	25	
21	4s(15.5); 7L(22.5)	50.0φ	W	47	1:1.0
21s1	2s(14.5); 6L(21.0)	41.5φ	R:NB	26	
22	1s(10.0); 7s(17.0); 5L(23.0)	30.5φ	W	175	1:1.0
22s1	1s(10.0); 7L(22.0)	45.5φ	R:NB	107	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
23	3L(23.5)	47.5 ϕ	NB:W/W (16.0/47.5)	3	1:1.0
23s1	--	54.5 ϕ	DB:W/W (9.5/54.5)	0	
24	5s(15.5); 3L(22.0)	34.5 ϕ	W	53	1:1.0
24s1	--	41.5 ϕ	NB	0	
25	5s(16.5); 5L(23.5)	43.0 ϕ	W	55	1:1.0
25s1	--	49.5 ϕ	NB	0	
26	4s(15.5); 2L(21.0)	30.5 ϕ	W	42	1:1.0
26s1	--	46.5 ϕ	NB	0	
27	2s(14.0); 9L(20.5)	27.0 ϕ	W	29	1:1.0
27s1	1s(14.0)	51.5 ϕ	R:NB	10	
28	2s(16.5)	58.0 ϕ	W	20	1:1.0
28s1	1s(15.0); 5L(22.0)	35.5 ϕ	R:NB	15	
29	2s(16.5); 8L(21.0)	26.0 ϕ	W	28	1:1.0
29s1	2s(13.0); 4L(20.0)	41.0 ϕ	R:NB	24	
30	--	0.5b	KB:NB	?	
31	1s(15.0); 4L(21.0)	31.5 ϕ	NB:W	14	1:1.0
31s1	6L(21.0)	42.5 ϕ	R:NB	6	
32	8s(16.5); 6L(22.5)	37.0 ϕ	W	86	1:1.0
32s1	2s(14.0); 1E(21.5)	44.0 ϕ	R:NB	21	
33	1s(10.5); 5s(16.0); 7L(23.0)	39.5 ϕ	W	157	1:1.0
33s1	1s(9.5); 7L(20.0)	42.5 ϕ	R:NB	107	
34	7L(23.0)	45.5 ϕ	W	7	1:1.0

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
34s1	8L(22.5)	42.0φ	LC:W/W (11.0/42.0)	8	
35	5s(17.5); 2L(23.0)	43.0φ	W	52	1:1.0
35s1	--	48.5φ	R:NB	0	
36	8s(17.0); 7L(24.5)	37.5φ	W	87	1:1.0
36s1	--	42.5φ	R:NB	0	
37	6s(17.5); 5L(24.5)	36.0φ	W	65	1:1.0
37s1	--	47.5φ	R:NB	0	
38	4s(18.0); 5L(24.0)	31.5φ	W	45	1:1.0
38s1	--	46.0φ	R:NB	0	
39	1s(10.5); 9s(18.0); 2L(25.5)	36.5φ	W	192	1:1.0
39s1	--	12.0b	R:NB	?	
40	8s(19.0); 4L(25.5)	44.0φ	W	84	1:1.0
40s1	--	0.5b	R:NB	?	
41	3s(17.5); 5L(24.5)	39.0φ	KB:NB	35	1:1.0
41s1	--	47.5φ	R:NB	0	
42	1s(17.0); 4L(22.5)	33.5φ	NB:W	14	1:1.0
42s1	1s(15.5)	17.5b	R:NB	1?	
43	2s(11.0); 4s(17.5); 3L(23.0)	33.0φ	W	243	1:1.0
43s1	7s(15.5)	40.5φ	R:NB	70	
44	7s(19.0); 8L(27.0)	36.0φ	W	78	1:1.0
44s1	1s(10.0); 4s(15.0); 3L(21.0)	40.0φ	R:NB	143	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
45	5L(22.5)	46.0φ	W	5	1:1.0
45s1	4L(22.5)	51.0φ	DB:W/W (18.0/51.0)	4	
46	--	12.0b	W	0	1:1.0
46s1	--	48.5φ	R:NB	0	
47	--	59.0φ	W	0	1:1.0
47s1	--	50.0φ	R:NB	0	
48	--	56.0φ	W	0	1:1.0
48s1	--	45.0φ	R:NB	0	
49	--	60.0φ	W	0	1:1.0
49s1	--	49.0φ	R:NB	0	
50	--	55.5φ	W	0	1:1.0
50s1	--	34.5φ	R:NB	0	
51	--	62.0φ	W	0	1:1.0
51s1	--	47.5φ	R:NB	0	
52	missing				
53	--	48.5φ	NB:W	0	1:1.0
53s1	--	45.5φ	R:NB	0	
54	--	65.5φ	W	0	1:1.0
54s1	--	46.5φ	R:NB	0	
55	--	44.5b	W	0	1:1.0
55s1	--	51.0φ	R:NB	0	
56	6s(14.0); 3L(20.0)	35.5φ	W	63	1:1.0
56s1	--	46.5φ	NB	0	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
57	2s(13.0); 7L(20.5)	39.5¢	W	27	1:1.0
57s1	--	36.5¢	NB	0	
58	3s(13.5); 4L(20.5)	43.5¢	W	34	1:1.0
58s1	--	46.5¢	NB	0	
59	3s(13.5); 4L(20.0)	41.5¢	W	34	1:1.0
59s1	1s(12.0); 1E(19.0)	44.5¢	R:NB	11	
60	3s(13.5); 3L(19.5)	41.0¢	W	33	1:1.0
60s1	1s(11.5); 6L(17.0)	37.0¢	R:NB	16	
61	4s(14.0); 4L(21.5)	41.0¢	W	44	1:1.0
61s1	1s(12.0); 8L(19.0)	29.5¢	R:NB	18+1	
62	missing				
63	4s(14.0)	47.5¢	NB:W	40	1:1.0
63s1	3s(13.0); 3L(20.0)	34.5¢	R:NB	33	
64	4s(13.5)	41.5¢	W	40	1:1.0
64s1	3s(13.0); 3L(20.5); 1E(21.0)	32.5¢	R:NB	33+1	
65	1s(7.0); 7s(15.0) 4L(20.5)	28.0¢	W	174	1:1.0
65s1	3s(5.5); 5s(13.0)	31.5¢	R:NB	350	
66	7s(13.5); 1E(19.5)	39.5¢	W	71	1:1.0
66s1	--	18.0b	NB	?	
67	1s(12.5); 5L(21.5)	43.0¢	W	15	1:1.0
67s1	--	43.0¢	NB	0	
68	1s(12.0); 6L(21.5)	39.5¢	W	16	1:1.0
68s1	--	59.0¢	NB	0	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
69	4s(12.0); 7L(21.5)	51.5¢	W	47	1:1.0
69s1	--	61.0¢	R:NB	0	
70	2s(12.0); 3L(21.5)	41.5¢	W	23	1:1.0
70s1	1s(11.0)	47.5¢	R:NB	10	
71	2s(12.0); 1E(23.5)	46.0¢	W	21	1:1.0
71s1	3s(10.5); 4L(17.5)	46.5¢	R:NB	34	
72	missing				
73	1s(12.0); 2L(17.5)	49.0¢	NB:W	12	1:1.0
73s1	1s(11.0); 2L(18.5)	48.0¢	R:NB	12	
74	1s(13.0); 9L(21.0)	32.5¢	W	19	1:1.0
74s1	2s(11.0); 7L(17.5)	45.0¢	R:NB	27	
75	1s(7.0); 1s(12.5); 1E(21.5)	57.0¢	W	111	1:1.0
75s1	2s(6.0); 8s(10.0)	44.5¢	R:NB	280	
76	--	63.0¢	W	0	1:1.0
76s1	--	64.0¢	R:NB	0	
77	4s(16.5)	43.5¢	W	40	1:1.0
77s1	--	35.0¢	R:NB	0	
78	4s(17.5); 5L(24.0)	32.5¢	W	45	1:1.0
78s1	--	50.0¢	R:NB	0	
79	3s(17.5); 3L(24.0)	37.5¢	W	33	1:1.0
79s1	--	50.0¢	R:NB	0	
80	3s(18.0); 4L(24.0)	39.5¢	W	34	1:1.0
80s1	--	60.0¢	R:NB	0	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
81	5s(18.5)	45.5¢	W	50	1:1.0
81s1	--	49.0¢	R:NB	0	
82	6s(19.0); 5L(24.0)	37.0¢	W	65	1:1.0
82s1	--	49.5¢	R:NB	0	
83	--	1.5b	KB:NB	?	1:1.0
83s1	--	48.5¢	R:NB	0	
84	2s(18.5); 9L(25.0)	38.5¢	NB:W	29	1:1.0
84s1	--	49.5¢	R:NB	0	
85	4s(19.0); 7L(25.5)	36.0¢	W	47	1:1.0
85s1	--	48.5¢	R:NB	0	
86	1s(12.5); 7s(20.0); 4L(25.5)	32.5¢	W	174	1:1.0
86s1	1s(10.5); 6s(17.5)	41.0¢	R:NB	160	
87	3s(18.5); 4L(25.5)	41.0¢	W	34	1:1.0
87s1	--	54.5¢	R:NB	0	
88	1s(18.0); 6L(25.5)	39.0¢	W	16	1:1.0
88s1	--	54.5¢	R:NB	0	
89	2s(18.5); 3L(26.0)	38.5b	W	23	1:1.0
89s1	--	49.5¢	R:NB	0	
90	2s(18.5); 6L(26.0)	36.5¢	W	26	1:1.0
90s1	--	53.5¢	R:NB	0	
91	3s(18.5); 6L(26.0)	38.5¢	W	36	1:1.0
91s1	1s(15.0); 2L(21.5)	44.0¢	R:NB	12	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
92	2s(18.5); 1E(25.5)	45.0¢	W	21	1:1.0
92s1	1s(15.5); 5L(22.0)	44.5¢	R:NB	15	
93	--	0.5b	KB:NB	?	
94	4s(18.5); 2L(25.5)	46.0¢	NB:W	42	1:1.0
94s1	2s(16.0); 5L(22.5)	43.0¢	R:NB	25	
95	3s(19.0); 2L(25.0)	38.0¢	W	32	1:1.0
95s1	4s(17.0); 5L(24.0)	43.5¢	R:NB	45	
96	1s(13.0); 2s(20.0); 3L(27.0)	43.0¢	W	123	1:1.0
96s1	8s(17.5); 4L(25.0)	41.5¢	R:NB	84	
97	7s(18.5); 6L(25.5)	39.0¢	W	76	1:1.0
97s1	--	48.5¢	R:NB	0	
98	3s(18.5); 3L(25.5)	53.5¢	W	33	1:1.0
98s1	--	54.5¢	R:NB	0	
99	5s(17.5); 9L(24.5)	44.0¢	W	59	1:1.0
99s1	1s(16.0); 2L(22.0)	52.0¢	R:NB	12	
100	3s(17.0); 9L(24.5)	46.0¢	W	39	1:1.0
100s1	3s(16.5)	46.0¢	R:NB	30	
101	2s(16.5); 7L(24.5)	49.0¢	W	27	1:1.0
101s1	3s(16.0); 5L(22.5)	40.0¢	R:NB	35	
102	3s(17.5); 7L(24.5)	47.5¢	W	37	1:1.0
102s1	2s(17.0); 8L(24.0)	37.5¢	R:NB	28	
103	--	2.0b	KB:NB	?	1:1.0
103s1	1s(17.0); 3L(24.0)	46.0¢	R:NB	13	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
104	1s(17.5); 8L(25.0)	40.0φ	NB:W	18	1:1.0
104s1	1s(16.0); 8L(23.0)	41.0φ	R:NB	18	
105	4s(19.0); 4L(25.5)	46.0φ	W	44	1:1.0
105s1	2s(18.0); 6L(26.0)	43.5φ	R:NB	26	
106	1s(12.0); 1s(18.5); 2L(25.5)	56.5φ	W	112	1:1.0
106s1	2s(12.0); 2s(19.0); 7L(25.0)	38.0φ	R:NB	227	
107	1s(13.0); 1s(20.0); 1E(25.5)	51.0φ	W	111	1:1.0
107s1	--	54.5φ	R:NB	0	
108	5s(19.0)	57.5φ	W	50	1:1.0
108s1	--	50.5φ	R:NB	0	
109	5s(18.5); 4L(26.0)	41.0φ	W	54	1:1.0
109s1	3L(22.5)	45.0φ	R:NB	3	
110	5s(19.0); 9L(24.0)	27.5b	W	59	1:1.0
110s1	3L(22.5)	49.0φ	R:NB	3	
111	6s(19.5); 6L(26.0)	35.5φ	W	66	1:1.0
111s1	7L(23.5)	39.5φ	R:NB	7	
112	6s(19.0)	37.5φ	W	60	1:1.0
112s1	1s(16.5); 4L(22.5)	48.0φ	R:NB	14	
113	--	1.5b	KB:NB	?	1:1.0
113s1	1s(17.0); 4L(23.5)	42.0φ	R:NB	14	
114	5s(19.5); 9L(26.0)	35.5φ	NB:W	59	1:1.0
114s1	2s(16.0); 3L(22.5)	44.0φ	R:NB	23	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
115	6s(20.5); 3L(27.0)	39.5¢	W	63	1:1.0
115s1	5s(18.0); 5L(24.5)	42.0¢	R:NB	55	
116	3s(13.0); 4s(19.5); 3L(26.0)	44.5¢	W	343	1:1.0
116s1	3s(12.0); 9s(19.0); 5L(21.0)	23.0¢	R:NB	395**	
117	3s(18.5); 1E(24.5)	43.0¢	W	31	1:1.0
117s1	--	53.0¢	R:NB	0	
118	3s(18.5); 3L(25.0)	42.5¢	W	33	1:1.0
118s1	--	49.5¢	R:NB	0	
119	4s(19.0); 3L(26.5)	41.0¢	W	43	1:1.0
119s1	2L(20.5)	46.0¢	R:NB	2	
120	3s(18.0); 9L(24.5)	36.0¢	W	39	1:1.0
120s1	8L(21.5)	39.5¢	R:NB	8	
121	2s(18.0); 9L(25.0)	33.0¢	W	29	1:1.0
121s1	2s(15.5); 4L(21.5)	40.0¢	R:NB	24	
122	2s(18.0); 6L(24.5)	34.0¢	W	26	1:1.0
122s1	2s(16.5); 5L(23.5)	44.0¢	R:NB	25	
123	--	2.5b	KB:NB	?	1:1.0
123s1	2s(14.5); 2L(21.0)	47.5¢	R:NB	22	
124	1s(18.5); 1E(26.0)	46.5¢	NB:W	11	1:1.0
124s1	2s(15.5); 7L(22.0)	40.5¢	R:NB	27	
125	4s(18.5); 8L(25.0)	35.5¢	W	48	1:1.0
125s1	3s(16.0); 4L(22.0)	44.0¢	R:NB	34	

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
126	1s(12.0); 1s(19.0); 2L(25.5)	47.0φ	W	112	1:1.0
126s1	2s(10.0); 8s(17.0); 3L(22.5)	31.0φ	R:NB	283	
127	2s(16.0); 7L(22.0)	36.0φ	W	27	1:1.0
127s1	--	52.5φ	R:NB	0	
128	3s(16.5); 1E(23.0)	40.5b	W	31	1:1.0
128s1	--	47.5φ	R:NB	0	
129	3s(16.5); 5L(23.0)	36.5φ	W	35	1:1.0
129s1	--	50.5φ	R:NB	0	
130	2s(16.5); 6L(23.0)	37.5φ	W	26	1:1.0
130s1	1s(15.0)	48.5φ	R:NB	10	
131	4s(17.5); 1E(24.5)	43.0φ	W	41	1:1.0
131s1	1s(14.5); 2L(20.5)	45.0φ	R:NB	12	
132	1s(17.0); 6L(23.5)	42.0φ	W	16	1:1.0
132s1	2s(16.0)	51.5φ	R:NB	20	
133	--	2.0b	KB:NB	?	1:1.0
133s1	--	49.5φ	R:NB	0	
134	1s(17.0); 9L(24.5)	39.0φ	NB:W	19	1:1.0
134s1	--	47.5φ	R:NB	0	
135	2s(17.0); 8L(23.5)	36.0φ	W	28	1:1.0
135s1	6s(15.0); 1E(21.0)	41.5φ	R:NB	61	
136	1s(11.5); 1s(17.5); 3L(24.5)	43.5φ	W	113	1:1.0

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
136s1	2s(10.5); 3s(16.0); 2L(22.0)	39.0¢	R:NB	232	
137	7s(19.0); 5L(24.0)	31.5¢	W	75	1:1.0
137s1	--	52.5¢	R:NB	0	
138	3s(18.0); 4L(25.5)	44.5¢	W	34	1:1.0
138s1	--	52.5¢	R:NB	0	
139	3s(18.0); 2L(25.0)	47.5¢	W	32	1:1.0
139s1	4L(24.0)	49.0¢	R:NB	4	
140	3s(18.0); 2L(24.5)	43.0¢	W	32	1:1.0
140s1	6L(23.5)	45.5¢	R:NB	6	
141	4s(18.0); 4L(24.5)	34.0¢	W	44	1:1.0
141s1	2s(16.5); 6L(24.0)	44.0¢	R:NB	26	
142	5s(18.5)	43.0¢	W	50	1:1.0
142s1	1s(16.0); 3L(23.5)	41.5¢	R:NB	13	
143	--	4.5b	KB:NB	?	1:1.0
143s1	4L(24.0)	44.5¢	R:NB	4	
144	2s(17.5); 9L(24.0)	40.0¢	NB:W	29	1:1.0
144s1	3L(21.0)	44.5¢	R:NB	3	
145	4s(18.0); 1E(26.0)	42.5¢	W	41	1:1.0
145s1	3s(16.5); 3L(22.5)	40.0¢	R:NB	33	
146	3s(12.0); 1s(18.5); 2L(24.5)	53.0¢	W	312	1:1.0
146s1	1s(9.0); 7s(15.5); 5L(22.5)	38.0¢	R:NB	175	

Observations

- 1.* A fragment stored with the quipu was associated with 10s1. The subsidiary is broken at 9.0 cm. and the fragment is 5.0 cm. long, broken at both ends, and has a cluster of 7s knots.
- 2.** The last knot cluster on 116s1 contains 5L or 6L knots.
3. This is one of several quipus acquired by the Museum in 1907 with provenance Pachacamac. For a list of them, see AS97.
4. Although there are some additional cords between groups, by spacing, the quipu is separated into 14 groups of 10 pendants each. A larger space on the main cord separates the quipu into 2 parts of 7 groups each.
5. All groups have the same color pattern: 6 W, 1 KB:NB, 1 NB:W, 2 W. In all groups in part 2, and in groups 1, 4, and 5 of part 1, each pendant has one subsidiary of color R:NB. In groups 2, 3, 6, and 7 of part 1, subsidiaries on the first 3 pendants are NB and those on the last 7 pendants are R:NB.
6. In all groups, subsidiaries on positions 1 and 2 are zero-valued (or blank). Also, all pendants and subsidiaries in the fifth group of part 1 are zero-valued (or blank).
7. In all groups (except for group 4 in part 1), the 10th position has the maximum value in the group.
8. In part 2, there is some symmetry of values around the center group (group 4). Specifically, values are the same in: positions 2, 4, and 10 of groups 5 and 3; position 4 and the subsidiary on position 5 of groups 2 and 6; and in position 8 of groups 1 and 7.
9. Within part 1, the sum of values on pendant 3 of all groups is the same as the sum for all pendant 4 values. That is,

$$\sum_{j=1}^7 P_{1j3} = \sum_{j=1}^7 P_{1j4}$$

Similarly, all values on pendant 2 of the groups of part 1 have the same sum as pendant 4 values of part 2, and values on pendant 6 of the groups of part 1 have the same sum as the pendant 2 values in part 2. That is,

$$\sum_{j=1}^7 P_{1j2} = \sum_{j=1}^7 P_{2j4}$$

$$\sum_{j=1}^7 P_{1j6} = \sum_{j=1}^7 P_{2j2}$$