QUIPU AS192

Museum identification: No. 41.2/6701 (American Museum of Natural History, N.Y.)

Main cord: color BB-W

$ 6.0 cm: group of 10 pendant cords (1-10), then space of 24.5 cm.

33.0 cm: end ¢

Cord	Knots (no., type, position)	Length	Color	Value	Subsidiaries (no., position)
1	1s(4.0);1s(10.0)	47.0¢	B	110	3:5.0-6.0
1s1	4s(4.5);9L(12.5)	26.0¢	B:W	49	
1s2	3s(4.5);9L(11.5)	27.5¢	BB:W	39	
1s3	6s(4.5);4L(12.0)	20.5¢	B	64	
2	3s(10.0);5L(18.0)	25.5¢	B	35	
3	1s(9.5);6L(17.5)	28.5¢	B	16	
4	1s(9.5)	26.5¢	B	10	
5	1s(9.0);3L(16.0)	26.0¢	B	13	
6	1s(9.5)	31.5¢	B	10	
7	1s(9.0);1E(16.0)	27.5¢	B	11	
8	7L(17.0)	27.5¢	B	7	
9	7L(17.0)	38.0¢	B	7	
10	3s(9.5);6L(17.0)	31.0¢	B	36	

Observations

1. AS190-AS197 were purchased by the Museum in 1969 from Louis Slavitz. Their provenance is near Callengo, Ica Valley. They are compared following AS190.

2. Pendant 1 is a sum cord for the group since the value on it and on its 3 subsidiaries all can be obtained by summing other pendant values in the group.

$$P1 = \sum_{i=3}^{10} P_i;\ P1s1 = \sum_{i=3}^{6} P_i;\ P1s2 = \sum_{i=3}^{5} P_i;\ P1s3 = \sum_{i=3}^{5} (P_i + P_{12-i})$$

3. An unusual number of perfect squares are values on the cords: $P1s1=49=7^2$, $P1s3=64=8^2$; $P3=16=4^2$; $P10=36=6^2$.

4. In keeping with observations 2 and 3, additional perfect squares can be found by summing cord values. The number of them and their patterned appearance seem to be more than chance.

   A. Separating the 9 pendants (P2-P10) into subgroups of 1, 3, 1, 3, 1 pendants each and calling them Y_i $i=1,\ldots,5$ (i.e., $Y_1=P_2$; $Y_2=P_3+P_4+P_5$; $Y_3=P_6$; $Y_4=P_7+P_8+P_9$; $Y_5=P_{10}$), the following hold:

   1) $Y_1 + Y_3 + Y_5 = 9^2$

      $Y_2 + Y_4 = 8^2$

   2) $Y_4 = 5^2$; $Y_5 = 6^2$

      $Y_2 + Y_3 = 7^2$; $Y_2 + Y_4 = 8^2$

      $Y_1 + Y_3 + Y_5 = 9^2$; $Y_2 + Y_4 + Y_5 = 10^2$

   3) $Y_2 + Y_3 = \sum_{i=3}^{6} P_i = 7^2$ and $\sum_{i=3}^{6} (P_i)^2 = (25)^2$.

   4) The values on P1 and its subsidiaries can also be expressed in terms of these subgroups:

      $P1=Y_2+Y_3+Y_4+Y_5$

$P1s1=Y_2+Y_3$

$P1s2=Y_2$

$P1s3=Y_2+Y_4$

B. An alternate separation into subgroups of 3, 1, 1, 1, 3 pendants such that $Y_1=P_2+P_3+P_4$; $Y_2=P_5$; $Y_3=P_6$; $Y_4=P_7$; $Y_5=P_8+P_9+P_{10}$ gives: $Y_1+Y_3+Y_5=11^2$.

C. Finally, the sum cord P1 and its subsidiaries can be viewed in terms of squares.

P1	$=5^2+6^2+7^2$		P1s3	$=8^2$
P1-P1s1	$=5^2+6^2$	or	P1s3-P1s2	$=5^2$
P1-P1s1+P1s2	$=6^2+8^2=10^2$		P1s3-P1s2+P1s1	$=5^2+7^2$
P1-P1s1+P1s2-P1s3	$=6^2$		-(P1s3-P1s2+P1s1)+P1	$=6^2$