To: WG2

Title: Feedback To N5006 For Adding New Symbols As Counting Rod Numbers

Source: TAO Yang(Chinese Characters Repertoire)

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We noticed that 5 new symbols would be added to counting rod numerals in N5006. According to the research of Chinese mathematicians, these 5 symbols are truly used as counting rod numerals. But we still suggest keeping this proposal pending for further research and discussion.

1. ***Mathematical Treatise in Nine Sections***(数书九章), which the new symbols come from, delivered by Eduardo Marin Silva as the evidence, is obviously a reprinted version in 1821(Qing Dynasty, the first year of DaoGuang), a book belong to ***YiJiaTang series***(宜稼堂丛书). For we haven't seen the original book, it's imprecisely to call them Southern Song Counting Rods.
   *By the way, 'Hangzhou numeral' should be revised as 'Suzhou numeral'.

2. The history of Chinese ancient counting numerals is too long to distinguish oracle and bronze numbers, counting rods and Suzhou numerals clearly. Some transitional form symbols appear in each type of counting system. It's better to put them into IVD if the new symbols have the same meaning with the encoded ones.
   Please see the picture below.

表22 古代与中古代的中国记数符号

3. According to our results of collection, it's believed that there are so many symbols are not encoded, for example, the zero, and negative numbers. Without organized collecting and arrangement, the counting system couldn't be a continuous sequence for the codes are given occasionally.
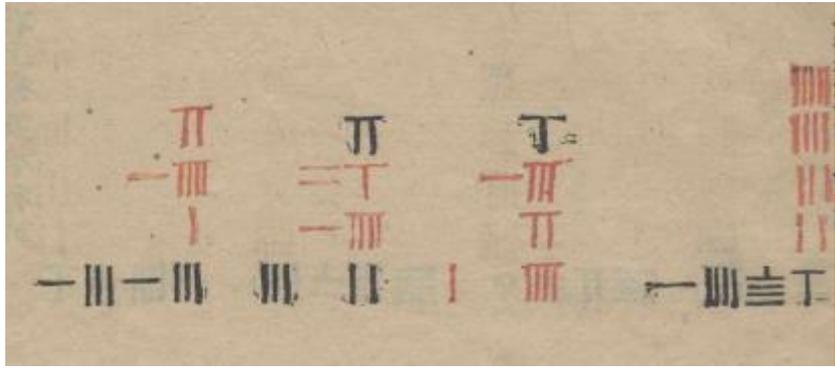
Up to now, we have found some new counting rod numbers, which could form complete sequence of natural numbers. Please see table 1.

Table 1: newly found counting rod numerals

Symbols	Names
	0
	-1
	-3
	-6
	-7
	-8
	-9
	-12
	-28
	-30

On the other hand, some books using red and black rods to express positive and negative numbers. Please see table 2.

Table 2: Red and black rods

Formulas		Symbols	Names
			1
			-1

4. Because rod-arithmetic of China didn't invent the mathematical operators, the actual meaning of the symbol depends on their position in formulas. The name of the symbols needs to be determined very carefully. Please see table 3.

Table 3: Polysemous symbols

Formulas	Symbols	Meaning
		Zero, $-x^2+56x=2052$.
		Tianyuan symbol, for setting the unknown number(Chinese term "立天元一")
		Empty position

5. It's believed that Suzhou numerals may be invented by ancient Chinese mathematicians to reduce the strokes of rod numerals. Whether to encode the Suzhou numerals separately or not is still questionable for us. It would be very complicated to defining the newly proposed symbols if Suzhou numerals are assigned to an individual area.

6. The research on rod-arithmetic of China is not comprehensive and systematic, so we think it's not in hurry to encode the sporadic symbols, further analyzing studies on terminology and structure are in need. For our project Chinese Characters Repertoire have the duty on searching and coding non-character symbols from Chinese literature, we would make greater efforts to complete the arrangement of counting rod numerals.

End of this file, with our respect to Eduardo Marin Silva's work.