Civilization 192

Chapter 192 - Mathematics and Calendrics: The Lost Maya

The setting sun dyed the vast world, as well as the tequila in the pottery cups, leaving behind the last brilliant colors, just as the vanishing civilization.

Xiulote tasted a bit of salt and then downed a cup of silvery pure fermented beverage, the slight bitterness bringing numbness to the tip of his tongue, a warm current rising from his stomach. The youth smiled faintly, quietly savoring, and reflected for a long time.

Tikalo added some tomatoes to the drink, then some red mandragora of his own, and after tasting a chili, took a big swig. Maya nobility were inheritors of an even more ancient tradition of using hallucinogenic plants. Soon, he spun his slender head, his gaze becoming slightly scattered, and he couldn't help but chant softly.

"The life of a Divine Descendant is like base liquor, enduring the trials of many spirits, having tasted the flavors of bitterness, sweetness, sourness, and spiciness to obtain its essence... and so, after drinking to the lees, like entering a dream into fantasy, ultimately going towards the Divine Kingdom."
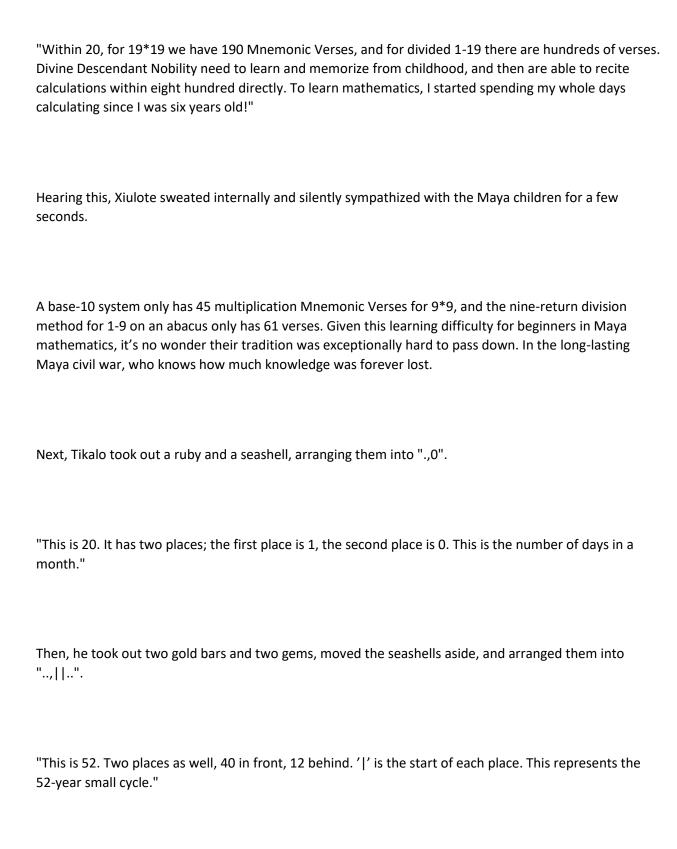
Hearing this, Xiulote laughed heartily. It was only when he was well into his cups that he asked the question that had been lurking in his mind for a long time.

"Tikalo, you Maya nobility claim to be Descendants of the Gods, have you truly inherited the knowledge of the spirits?"

Tikalo's face showed pride. He opened his mouth, unhesitating.

"Of course! We, the Divine Tribe of the corn, are the most wise..."

Just as he said this, the Mayan merchants suddenly felt a chill. He then remembered that his drinking companion was not a Mayan colleague from the caravan, but a Mexica ruler who claimed to be a Divine Descendant. He quickly took a drink to stem his words, then subtly changed his tune.

"We, the people of corn, are the friendliest tribe, and the people of Mexica are our eternal friends. We excel in mathematics and astronomy, able to revise the calendars of the moon, the sun, and Venus, and also able to help the people of Mexica construct magnificent wonders."

Xiulote nodded in approval, his thoughts flowing. Maya nobility took great pride in the glory of their great ancestors, and it appeared that assimilation would be very difficult. He looked at Tikalo without changing expression and patted his shoulder affectionately.

"Tell me more! I've long heard of Maya mathematics and calendars."

After pondering for a moment, Tikalo went straight to the treasure chest he had brought that day, taking out a seashell, a ruby, and three gold bars.

"Your Highness, please look." He first placed the seashell on the table and pointed with his hand, "This is 0, representing nonexistence, also the time before the beginning of the Era."

Xiulote was slightly surprised. The Maya's understanding of "0" seemed to be much earlier than that of Europeans.

"Our Maya mathematics uses a base-20 numerical system. Each place starts at 0 and goes up to 19."

As he spoke, Tikalo took out three gold bars and stood them up in front, then he placed four rubies neatly behind them in an arrangement of "|||...."

"This is 19. On each place, a '|' represents five, and a '.' represents one. Every five '.' are carried over into a '|'. If you add 1 to 19, it will carry over a '.', which means adding 1 to the next place."

Xiulote thought for a moment; this was a base-20 system ranging from 0-19. Following the abacus progression of Huaxia, there were surely similar rules for addition, subtraction, multiplication, and division.

He pondered and then asked.

"So the addition and subtraction of each place are handled by dealing with each '|' and '.' individually, with four '|'s accumulating into a carryover, and every five '.'s moving up one place. Do you have a method or Mnemonic Verse for multiplication and division for each place?"

Tikalo looked somewhat astonished. He stared at Xiulote with wide-open eyes. Were the mathematics of the Mexica people this good too? He then nodded proudly.

"Within 20, for 19*19 we have 190 Mnemonic Verses, and for divided 1-19 there are hundreds of verses. Divine Descendant Nobility need to learn and memorize from childhood, and then are able to recite calculations within eight hundred directly. To learn mathematics, I started spending my whole days calculating since I was six years old!"

Hearing this, Xiulote sweated internally and silently sympathized with the Maya children for a few seconds.

A base-10 system only has 45 multiplication Mnemonic Verses for 9*9, and the nine-return division method for 1-9 on an abacus only has 61 verses. Given this learning difficulty for beginners in Maya mathematics, it's no wonder their tradition was exceptionally hard to pass down. In the long-lasting Maya civil war, who knows how much knowledge was forever lost.

Next, Tikalo took out a ruby and a seashell, arranging them into ".,0".

"This is 20. It has two places; the first place is 1, the second place is 0. This is the number of days in a month."

Then, he took out two gold bars and two gems, moved the seashells aside, and arranged them into "..,||..".

"This is 52. Two places as well, 40 in front, 12 behind. '|' is the start of each place. This represents the 52-year small cycle."

After that, the Mayan merchants took out four gems and directly spread them out as ".,.,.,.."

He looked at the youth with slight pride.

"Your Highness, can you tell what this number is?"

"8421."

Xiulote did a mental calculation in a few seconds and came up with the result quickly.

Tikalo scratched his head. He was surprised for a moment, then decided to raise the difficulty. Maya people never conceded in mathematics! He took out six gems and divided them into two groups, each group being ".,.,."

"Then, Your Highness, what do you think is the product of these two groups?"

Xiulote paused slightly, 421*421? He took out an obsidian knife and scratched out some calculations on the ground before giving the answer.

"177241."

Upon hearing the correct answer, Tikalo was completely astonished. The words he had prepared were no longer needed! After a while, he finally replied.

"Well, Your Highness, you calculated correctly. But the speed is too slow."

As he spoke, he multiplied the "1,1,1" gems on each place, starting from the end to the beginning. At the end, accumulating once resulted in "1", the next place accumulates twice for "2", followed by three places "3,2,1". In just a few seconds, he obtained the base-20 number "12321", which is also the base-10 number "177241".

Seeing the Mayan merchants' rapid calculation, Xiulote felt admiration for such a concise and efficient number system!

Maya base-20 mathematics demonstrated their superiority in record keeping and calculation especially when it came to large numbers and astronomical fields. Such a mathematical system should not have appeared in the ancient civilizations of the Stone Age, but would have been more suited for a cosmic civilization capable of navigating the stars.