

9. Aztec Numerical Glyphs

The Aztecs collected tribute from various parts of Mexico that fell under their control. The surviving written records reflect a complex system of counting expressed in hieroglyphic symbols. The Aztecs employed four symbols: a vertical line, a group of five lines linked at the top, a dot, and a corn glyph. They used the position of the symbol to indicate the symbol's value.

Due to the Spanish conquest, knowledge of this "positional-line-and-dot" system is limited. Scholars have gathered most of their facts from the *Codice de Santa Maria Asuncion* and the *Codex Vergara*. These codices are divided into three parts. The first, *tlacatlacuiloli*, contains the name of the head of the household. The second, *milcocoli*, was a record of how much land each household owned. To record this data a scribe would draw the approximate shape of each field. The measurement of each side of the field, obtained by Aztec surveyors, was recorded using lines and dots, a line equal to one linear unit, a dot equal to 20. The standard unit of linear measure, the *quahuatl*, was approximately 2.5 meters. Also, the position of the symbol in this section did not affect its value. The third section, the *tlahuelmantli*, is another record of the same lands as the *milcocoli*. However, the lands in the *tlahuelmantli* are all rectangles of the same size with a protuberance in the upper right hand corner.

Researchers have determined that the positions of the lines and dots in the *tlahuelmantli* section have arithmetic significance and that the sum of all the numbers in the *tlahuelmantli* section represented the area of the field in square *quahuatl*. The *tlahuelmantli* rectangle records numbers in three "registers." The first register is in the upper right protuberance. No dots occur here, only 0-19 lines/groups of lines. Each line is worth 1 square *quahuatl*. The second register is along the bottom line of the rectangle. Again, no dots occur here, only 0-19 lines/groups of lines. Each line is worth 20 square *quahuatl*. The central portion of the rectangle constitutes the 3rd register. Dots and 0-19 lines/groups of lines occur here. Each line is worth 20 square *quahuatl* and the dots are worth 400 square *quahuatl*. If the third register is empty, the Aztecs would draw a corn glyph to represent zero.

Researchers have not yet discovered how the Aztecs computed area and how accurate they were. The *milcocoli* section does not provide enough information to calculate the exact area of the fields. Therefore, it could not have been used to produce the *tlahuelmantli* (records of area); there must have been intermediate steps in area calculation between the two records.

The significance of the Aztec's ability to calculate area was that in ancient Mexico landholding commoners paid tribute on the quantity of land they owned. It has been estimated that the tribute was one cacao bean (used to make chocolate) per 20 square units of land. Interestingly, if you add up the numbers from the *tlahuelmantli*'s third register and second register and do not multiply them by 20, then you have the number of cacao beans due. Thus, the *tlahuelmantli* section could have been used as a "tax table".

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