

Expert weighs in on Mayan calendar cycle

December 20 2012

(Phys.org)—December 21, 2012 is not the end of the world. Even the ancient Maya themselves did not think so.

The date does, however, mark the completion of a huge 5,125-year long cycle in the ancient Maya 'Long Count' calendar. Or at least it does if one accepts the correlation between the Long Count and our Gregorian calendar that is favoured by most Mayanists—the [correlation](#) is not certain, and the most strongly argued alternative places the end-date on December 23.

How could the Maya come to conceive of such huge lengths of time, and why? The origins of Maya society can perhaps be traced back to the mid-second millennium BC, and modern Maya people still thrive in southern Mexico, Belize and Guatemala, but this only amounts to some 3500 years in total. What is more, the [archaeological evidence](#) suggests that the calendar itself was only invented around 200 BC, well after its own 'zero date' back in 3114 BC.

Societies in pre-Columbian Mesoamerica created cyclical calendars of extraordinary complexity, going to tremendous lengths to identify coincidences between various numbers of cycles of different [celestial bodies](#). The primary motivation was prognostication and prophecy. Perhaps the main reason that the Maya went one step further and created a linear calendar was that they could—and the reason that they could was that (unlike the [Romans](#), for example) they discovered a way of expressing numbers using a fixed base system, so that any number, however large, could be expressed simply as a sequences of [digits](#). They

used a vigesimal (base 20) system rather than our decimal (base 10) system, and for this reason found it natural to conceive of periods of time equal to twenty (360-day) years (a katun), 400 years (a bak'tun) and even 8000 years (a pic'tun). The reasons for their particular retrospective choice of a 'zero', or creation, date remains much debated. One possibility is that it was a time when (as they calculated it) several significant astronomical cycles would have coincided.

The completion of large cycles were auspicious times, and the 2012 end-date marks the completion of the 13th bak'tun—exactly $13 \times 144,000$ days since the zero date. What did the ancient Maya themselves expect would happen at this time—which gods would come to the fore, what ceremonies and rites of passages would be needed? Some Mayanists are trying to address these questions from the sparse evidence provided by scattered texts and inscriptions. But it is clear that the completion of one cycle was succeeded by the start of the next one, and indeed a few inscriptions are known that refer to dates after the end of the 13th bak'tun.

Two astronomical facts have compounded speculation that December 21, 2012 is a cataclysmic date. The first is that the supposed Maya end-date coincides with the solstice. Coincidence it probably is, since there is very little evidence that the solstices were of any great significance to the Maya. The second is that there is a supposedly rare 'galactic alignment', when the path of the sun in the sky crosses the galactic equator. In fact, this alignment occurs annually, slipping very slowly against the solar year, so that by about 70 years' time it will occur each year on December 22.

It is worth noting in passing that the Maya soothsayers completely failed to predict the Spanish Conquest—genuinely the end of the world as they knew it.

For anyone who has a serious interest in this issue I thoroughly recommend the book 2012: Science and Prophecy of the [Ancient Maya](#) by Mark van Stone (Tlacaélel Press, San Diego, 2010) and also Anthony Aveni's book The End of Time: The Maya Mystery of 2012 (University Press of Colorado, 2009).

Provided by University of Leicester

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