The Astronomy of Three Dates in the Xultun Tables

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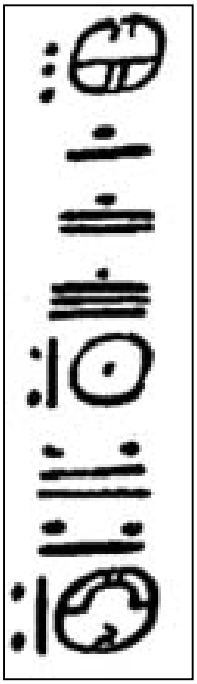
In their recent essay "The Handwriting on the Wall: Some Astronomical Interpretations of the Recent Discoveries at Xultun, Guatemala", Victoria Bricker, Anthony Aveni, and Harvey Bricker propose a real time anchor for some astronomical references in late-Classic Period wall writings discovered in early 2010 and published in early 2012.[1] The entire text was not published at that time. The site of Xultun is a short distance northwest of Waxactun, which itself is twelve miles north of Tikal.

In the abstract to the paper they write: "Our analysis of glyphs accompanying the Long Count date enables us to place candidate eclipses, especially one that corresponds with a conjunction of Mars, in real time" (152). The argument for this real time placement utilizes a three-hearthstone glyph as a likely location for an eclipse, above the constellation of Orion. The triangular "hearthstones" of Maya Creation Mythology consist of the belt and sword-point stars of Orion, forming a triangle. Through the work of Barbara MacLeod, Barbara Tedlock, and in the book *Maya Cosmos* (1993) by Freidel, Schele and Parker, evidence and argument was rallied that showed the three hearthstones were stated in Creation Texts relating to the 3114 BC Era Base, and the conceptual construct included the Gemini "peccaries", the "Ak" turtle glyph, and the crossroads of the Milky Way and the ecliptic. The sun annually passed through these astronomical features in late May during the late Classic Period.



The one date that corresponds with a conjunction of Mars, emphasized by the authors in their abstract, is a lunar eclipse near Mars that occurred just above the Orion hearthstones, on the morning of December 3, 792 AD.[2] In Area B of Structure 10K-2, the Tzolkin date of this date and two other Tzolkin dates are separated by two Distance Numbers (see Figure 1).

<= Figure 1. The three Tzolkin dates: 3 Ben, 7 Muluc, 7 Cib, separated by the distance numbers of 2394 days and 247 days.

The 2390-day interval (+4 days, in this case, to reach the eclipse) is well known from the Palenque Lunar Tables. It is 81 lunar *phase* cycles and 87.5 lunar *sidereal* cycles. As such, the second date that is generated by subtracting 2394 days from December 3, 792 is May 12, 686 AD. If the pure lunar interval of 2390 days is applied, we reach May 16, 686. The sidereal half-period does not factor precisely into 2390 days, so there is a two-day difference; precise opposition to the 792 date is found on May 18, 686. The 6-day period between the 12th and the 18th embraces a process that involves the lunar full moon, lunar opposition to the moon's position on the 792 date, and conjunction of the moon with Mars at the Crossroads of the Milky Way and the ecliptic in Sagittarius (at the southern terminus of the Dark Rift in the Milky Way).

[1] *Latin American Antiquity* 25 (2), 2014, pp. 152-169. The Society for American Archaeology.

[2] I have converted the authors' Gregorian dates to Julian, for ease in mapping with Starry Night Pro v. 6.2.2 astronomy software. The 584283 correlation is used in all examples.

This striking situation, indicated by the date-zone in 686 AD, can be expected (because of the nature of the 2394-day Distance Number) to do two things: reach another full moon and place the moon at the opposite location in the sky. And it does do that. We also have a situation with Mars, in which Mars has shifted from the Gemini Crossroads to the Sagittarius Crossroads — and on both dates it is in conjunction with the full moon! A comparison of the sky on the two dates reveals this striking parallel:

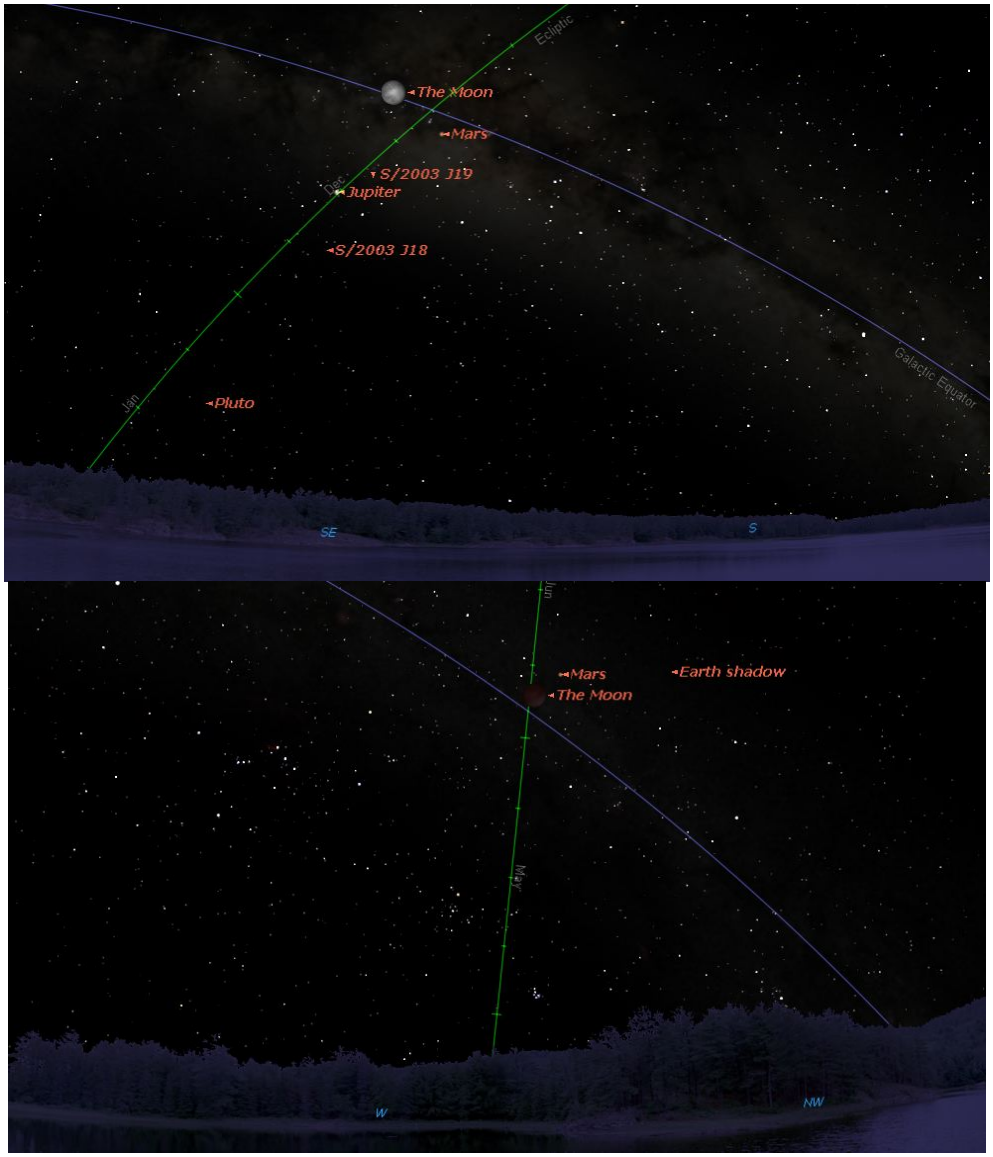


Figure 2: May 18, 686 AD (above) and December 3, 792 AD (below).

Notice the full moon's eclipse near Mars and the Gemini Crossroads on the 792 date, compared to the full moon near Mars and the Sagittarius Crossroads on the 686 date. The second Distance Number (247 days) is 9 lunar sidereal periods, and is applied to the 792 date to the reach the expected Tzolkin date (7 Cib), which is August 5, 793. This returns the moon to the Dark Rift-XRDS (though it is now ten days from a full moon), and August 5 is close to the solar zenith-passage day at the latitude of Xultun. This date

highlights, again, the Dark Rift XRDS, and provides an anchor within the Tropical Year (the solar zenith-passage date).

To summarize, the three dates reconstructed by Aveni and the Brickers highlight two opposed parts of the sky, which are where the two Crossroads of the Milky Way and the ecliptic are located. The authors mention the three hearthstones in the text as an identifier for the eclipse location on the 792 date, because it is directly below the eclipse. This may be so, but the two Crossroads are more precise markers for the alignments of Mars and the moon on all three dates. The December 3, 792 lunar eclipse date places the sun at the Dark Rift XRDS. The May 18, 686 date places the moon and Mars at the Dark Rift XRDS. And the August 5, 793 date returns the moon to the Dark Rift XRDS. This sidereal location is also where the sun, on the solstice, was located on the great 13-Baktun period-ending in 2012. That the key DN in the Xultun tables is also found in the Palenque Lunar Tables is interesting, for we have a context at Palenque for the importance of the Dark Rift XRDS location. Michael Grofe[3] identified that the "earth-touching" (or birthday) of the deity GI, recorded on the Tablet of the Cross from the Triad Group at Palenque, places the sun at the Dark Rift XRDS in the year 2360 BC. Furthermore, the iconography of the tablet shows the skull-head of GI at the base of the tree, where an ecliptic band extends from the right to the left. The upright image of the tree-cross on the tablet faces out the door of the temple to the southwest and reflects the vertical position of the Milky Way on that birth-date, and over that southwest horizon. So, the iconography and archaeoastronomical alignment of the temple's door confirm the astronomy that occurred on GI's birthday. And it highlights the sun's position at the Dark Rift XRDS, which is important in the Xultun dates.

The same situation is found in the birthday of Lord Jaguar from Tortuguero Monument 6, which mentions the 2012 period-ending date.[4] Clearly, the XRDS are reference markers for lunar synodic and sidereal commensurations, eclipses, and the Mars period. The Creation Myth implication of the three hearthstones is relevant, because it marks the Era Base "completion of 13 Baktuns" in 3114 BC, as is the Dark Rift XRDS, since it marks the solstice sun's position on the period ending in 2012, which is also a "completion of 13 Baktuns." Both dates mark Creation Days in the World Age doctrine of Maya time philosophy, and although different astronomy is involved, the XRDS positions *are important in both*, and the 4 Ajaw 13.0.0.0.0 date on December 21, 2012 replicates the same Creation Date in 3114 BC, conceptually and calendrically,.[5]

This paper has only briefly treated one aspect of the Xultun texts. I feel it was necessary to clarify two astronomical referents that were overlooked by the Brickers and Aveni. The out-of-date 1991 EZCosmos software they used to illustrate the sky on the 792 AD date does not depict the Milky Way (Schele used this software but she manually drew in the Milky Way). It's unclear why the authors neglect mentioning the Milky Way's prominent role on the three dates they identified. Aveni, at least, is well aware of my 2012 alignment reconstruction which uses the sun's position on the Milky Way (as indicated on the 792 AD date, and which occurred on *the solstice* in 2012).

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[3] Grofe (2011, *IAU* Vol. 7 no. 278) and Grofe (2012, *Archaeoastronomy Journal*, Vol. XXIV).

[4] Discovered by Michael Grofe in February 2009. For this and my further exploration of the astronomy in the Tortuguero dates, see my paper "The Astronomy of the Tortuguero Inscriptions," April 15, 2010. The Society for American Archaeology. (online at http://thecenterfor2012studies.com).

[5] As I noted in my 1995 book *The Center of Mayan Time* (Four Ahau Press).