Steps in Understanding Calendar Continuity and in Verifying the Correct Correlation

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This brief note presents a rational treatment of the argument for continuity in a step-by-step way. The integrity and consistency of the 260-day count's correlation with the Julian calendar is first demonstrated across large geographical distance during the Conquest era. Several difficulties logically follow for the advocates of discontinuity, which are clearly presented and explained. Other criteria — including the calendrical equivalence of 13.0.0.0.0 = 4 Ajaw, archaeological data (Carbon-14 dating), and astronomical data from Classic Period inscriptions — provide limit filters. Using the data and evidence, discontinuity between the surviving contemporary position of the 260-day count and the Classic Period position of the same, is revealed to be an indefensible position. Furthermore, with continuity as the only rationally supportable position, the 584283 can consequently be confirmed in collusion with the other criteria discussed. This is a brief treatment of arguments I have made elsewhere, going back my 1992 book *Tzolkin*.

Evidence for 260-day Calendar Positions at the Time of the Conquest

Based on historical documents, we can determine 260-day calendar positions in relation to the Julian calendar at the time of the Conquest. (*Note: This is not the same as, and does not involve, de Landa's famous Katun correlation statement*.) These 260-day "tzolkin" placements can be verified as identical in three widely separated regions of Mesoamerica: Central Mexico, Yucatan, and Guatemala. The evidence was collected and discussed by Munro Edmonson in his *Book of the Year* (1988). The ethno-historical evidence *among the Aztec at the time of the Conquest*, is related in Edmonson (1988: 62-63):

> "1521, 13th of August (Julian) = 1 Chicchan 3 Uo (T):
>
> And when the shields were laid down,
> When we fell,
> It was the year count
> 3 House (Aztec)
> And in the day count
> It was 1 Serpent … (Sahagún 1975: 12:122)"

Compare this with the Spanish account and dating of the same event:

> "Cuauhtemoc and his captains
> were taken on the thirteenth
> of August at the hour of
> vespers on the day of the lord
> San Hipolito in the year 1521… (Díaz 1904: 2:129)"

Here, Edmonson combines the historical documents of Díaz and Sahagún to come up with the correlation figure of **1 Chicchan [1 Serpent] = August 13th, 1521 (Julian)**. This correlation is possible if one uses the 584283 correlation, but is not possible if one uses any of the other proposed correlations, with the exception of the Spinden correlation (489383), which is different from the 584283 correlation by a multiple of 260. I'll discuss this in more detail in a moment.

In Yucatan, Edmonson then presents several mutually confirming sources that correlate the 260-day calendar position with the Julian calendar then in use by the Spanish. I'll select one example. A passage from the *Book of Chumayel* equates December 9, 1541 with 5 Mol (in the haab). We know how the year bearers of the Mayapan calendar (the "Four Changers" in the passage) were operating at this time, thus 5 Mol in late 1541 equals 1 Lamat (in the 260-day count). See Edmonson (1988: 72 – typo corrected). Thus **1 Lamat = December 9, 1541**. Again, this is possible in the 584283, and is congruent with the Central Mexican example given above.

In Guatemala, we have the *Annals of the Cakchiquels* which states that "On the day 1 Hunter there arrived the Castillians at the city of Iximche" (Edmonson 1988: 66). Historically, we know that this took place in 1524. More precisely, Pedro de Alvarado wrote in his journal that he was "leaving for the city of Guatemala" on "Monday, April 11, 1524" (Edmonson 1988: 66-67). Edmonson points out that Alvarado was delayed leaving Utatlan until the 12th, and thus did not arrive in Iximche until the 14th. The equivalence is thus **April 14, 1524 = 1 Hunter (1 Ajaw)** (Edmonson 1988:66). This is precisely congruent with the Central Mexican and the Yucatan placements, which are all possible if one uses the 584283. In another passage from the *Annals of the Cakchiquels* we read that the volcanic eruption and the "great landslide" that destroyed Ciudad Vieja (the old capitol) occurred on 2 Flint in the 260-day calendar. From historical Spanish documents we know that this occurred on September 10, 1541 (Edmonson 1988: 71-72). The equivalence of **2 Flint = September 10, 1541** is consistent with the other examples and provides additional proof of calendrical congruence between Guatemala, Yucatan, and Central Mexico.

These examples indicate a pan-Mesoamerican value of continuity, of the 260-day calendar, across space. In Aldana's treatment of the correlation issue (Aldana 2010), he did not cite Edmonson's collected evidence, derived from primary sources, for the 260-day placement at the time of the Conquest. It is important because it shows that the internal stability of the 260-day ritual count is very great, mitigating the plausibility of accidental or intentional discontinuity. As we'll see, the positions of discontinuity vs continuity are not on equal footing. Those who accept or entertain discontinuity bear the burden of explaining away several near-impossible circumstances, which I'll address in a moment.

It should be emphasized that these verified and mutually confirming 260-day positions during the Conquest era do not in themselves verify a base date *for the Long Count era*. We need to incorporate other criteria which will narrow the possible range for any proposed Long Count correlation. These criteria are mainly three: 1) *archaeological*:

Carbon-14 date ranges; 2) *astronomical*: moon ages, eclipses, and Venus risings in the dated Classic Period inscriptions; and 3) *calendrical*: the linked relationship between the Long Count and the 260-day count.

Filters Eliminating Other Proposed Correlations

We can now take the next step. Carbon-14 dating narrows the range of investigation to about 200 years, at the maximum outer limit. The base date of the current era, determined by a given correlation, would have to bring testable Long Count dates preserved at archaeological sites into a temporal range that is supported by the C-14 dating method. The 584283 passes this test; the Spinden correlation does not. Astronomical events are a more complex consideration, because many events are repeated with periodicities commensurate with the 260-day cycle. Nevertheless, a proper consideration of the astronomical content of the dated inscriptions does rule out many of the proposed correlations. The 584283 works well, with an ambiguity in some data examples of several days (in other words, a given astronomical event does not provide a *precise* match with the 584283 every time). This is easily accounted for by the variability of astronomical events, such as Venus risings, and the challenge of creating ideal tables to predict variable astronomical events. By this, I mean for example that the average synodical period of Venus is just under the Maya ideal of 584 days. Predictive tables will eventually become discordant with the empirical event. More to the point, Venus heliacal risings vary between 580 and 588 days, *sometimes even from cycle to cycle*.

There is some possibility, as Grofe (2011) suggests, that the 584285, two days different from the 283, may have been used at Copan in the 7th century in the calculation of solar nadirs. This is based on an exact match in a phenomenon with an inherent temporal range, and we can't be sure if this usage represents an accepted adaptation. In any case, the 584283 is a very good match for the astronomy, especially in regard to the new information on the astronomy of the 13 dates on Tortuguero Monument 6 (Jenkins 2010, 2011a and 2011b) and the Tablet of the Temple for the Cross (see Grofe, 2011 and the "In Press" entry in the sources). The third limit function is calendrical: The 260-day count and the Long Count are related to each other by the equation 13.0.0.0.0 = 4 Ajaw. The two 13.0.0.0.0 dates we have in the hieroglyphic record fall in 3114 BC and in 2012 AD. The 13-Baktun period that separates these two dates consists of 1,872,000 days, which is divisible by 260. Thus, both of the 13.0.0.0.0 dates fall on 4 Ajaw. Because of the 260-day count's demonstrated anchoring in real time, and the extreme implausibility of discontinuity, the calendrical equation between the 260-day count and the Long Count provides a litmus test for any proposed correlation applied to Classic Period Long Count dates.

In the highlands of Guatemala today, the Quiché Maya and other groups retain the count of 260-days. This count is equivalent to the Conquest-era placement documented above. This indicates a degree of continuity across time, at least from the Conquest period until now. This 500 years of genocidal decimation of Native American life and culture has clearly been the most challenging in terms of survival and retaining Maya tradition, more so than any other time of Maya history, and yet the internal integrity of the 260-day count

was maintained. If we track further back in time, before the Conquest and into the Classic Maya period, we have astronomical data recorded in the inscriptions, including moon ages, Venus heliacal risings, and eclipses. Scholars seeking the best fit correlation have utilized this data, in addition to C-14 and other data, to determine the best correlation fit. Of all the many correlations suggested that meet the astronomical criterion, the GMT 584283 is the only one that is also congruent with the placement of the 260-day count documented during the Conquest. If we assume that a discontinuity may have occurred between the Classic Period and the Conquest period, which knocked the placement of the 260-day count off by 2 or more days, we confront two possibilities: First, the discontinuity of the 260-day placement was *accidental*, a fault of the daykeepers. But then we have to explain how the same amount of accidental discrepancy occurred in three widely separated regions, such that they were all in synchrony by the time of the Conquest. The second possibility is that the shift from the Classic Period Maya placement to the Conquest-era placement was *intentional*. Then we bear the burden of suggesting why such a shift, in an inherently stable and conservative tradition, was deemed necessary by the Maya and needed to be universally adopted, and how the shifted placement was orchestrated simultaneously in three widely separated regions (among groups speaking different languages, a thousand miles apart). Is there any plausible way that the 260-day counts could have become congruent with each other in those widely separated regions, even while one or more dislocations were occurring? I welcome all suggestions; I can think of none.

The assumption of discontinuity is not on equal footing with the assumption of continuity. It's misleading to suggest that these are two equally plausible positions. It's a false equivalence, because the proponents of discontinuity have not thought through and grappled with the implications of their position, and what they must account for if their position is to be maintained. Given the facts of the 260-day placement through time and space presented here, *continuity is the default position*, and the adherents of discontinuity bear the burden of convincing us of the merits of their extremely unlikely position.

So, as mentioned, the 260-day positions during the Conquest do not in themselves verify a base date for the current Long Count era. However, as mentioned, the equation of 13.0.0.0.0 = 4 Ajaw limits the field, given that it provides a positional anchor of the 260-day count with the Long Count. Because no one can convincingly explain how the Classic Period day-count could have dislocated itself into accidental equivalence six hundred years later in three widely separated regions at the time of the Conquest, we are left with continuity and can thus feel safe in extending the documented 4 Ajaw position of the Conquest era back into the Classic Period. We then have a more limited set of possible correlations, admittedly still rather large. But we can further filter out those correlations that do not work with the astronomical data in the Classic Period inscriptions. In effect, any of the proposed Long Count base-date correlations which do not match the Conquest-era placement of the 260-day calendar, can be filtered out. There are, in fact, only two of the many proposed correlations that make it through these filters: the 584283 and the old Spinden correlation (almost 260 years prior to the 584283). Another filter from empirical science rules out the Spinden correlation: The Spinden correlation has been long overruled based upon being outside Carbon-14 ranges. This

filter also mitigates Kelley's correlation and the recently proposed Wells-Fuls correlation. We are left with, by the process of elimination, the 584283 correlation.

Further Considerations

With this in place, we notice that the two 13.0.0.0.0 dates in the Long Count system (the one in 3114 BC and the one in 2012 AD) coordinate with astronomically significant dates. The former is within an observational 3-day range for the second "no shadow" solar zenith passage date at the latitude of Izapa, a site which many scholars now believe was involved in the formulation of the Long Count (and possibly the 260-day count). The latter date corresponds to a solstice, with the sun positioned right at the Crossroads of the Milky Way and the ecliptic. One has to question whether the compelling "13 Bak'tun" bookends of 3114 BC and 2012 AD, falling on astronomically compelling events that involve astronomical features known from the Maya Creation Mythology and astronomy, can reasonably be explained away by invoking coincidence. It is also thus relevant to note that two of the three main monument groups at Izapa contain archaeoastronomical and iconographic clues that the Izapans were indeed thinking about the solstice position of the sun and the zenith position of the sun. The ball court in Group F points to the December solstice sunrise azimuth, and the idea of solar rebirth and Era renewal is expressed by the solar god-head being born from the throne on the west end of the ball court (Jenkins 1998). The three pillar-and-ball gnomons in Group B, placed in a triangular arrangement, express the sun-at-zenith concept (August 11-13 at Izapa), as well as the three-hearthstone concept which is central to the 3114 BC Creation date mythos elaborated during the Classic Period (Taube 1998: 439). For these many-pronged yet nicely interlocking and mutually confirming pieces of data to be coincidence is extremely implausible.

Summary

Properly understood and rationally analyzed, these simple facts of historically documented Conquest-era equivalencies between the 260-day calendar and the Julian calendar provide evidence for continuity. Combined with the other criteria discussed in this paper, the Conquest-era evidence also contributes to the set of limiting filters by which any proposed correlation must be judged, ultimately leaving only one Long Count correlation standing: 584283.

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Sources

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Resources for understanding the correlation issue:

Intro to the Maya calendars: http://www.alignment2012.com/fap4.html.
The calendar correlation: http://www.alignment2012.com/fap3.html.
My 1995 review-critique of Floyd Lounsbury's argument for the 584285: http://www.alignment2012.com/fap9.html.