Part I. How to Predict Astronomical Events Based on the Tzolk'in Calendar,
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We are going to use the length of the Tzolk'in calendar (260 days) as a reference for tracking solar system objects, cyclical patterns, and synodic events in the short term.

First, let's mention some well-known equivalence between Tzolk'in, zenithal passages, nodal transits, the synodic period of Mars, and, Venus as Morning and Evening Star.

The Tzolk'in and the Zenithal Passages

1 Tzolk'in = two consecutive zenithal passages in some regions of Mesoamerica (from August 13 to April 30).

Consequently, the distance between the other zenithal passages is 105 days (from April 30 to August 13).

So, we have an idealized cyclical pattern of [260 days : 105 days] for the Haab, and an idealized cyclical pattern of [260 days : 104 days] for the computing-year.

The Tzolk'in and Venus

1 Tzolk'in = Venus as Morning Star = Venus as Evening Star

The actual length is 263 days for each event, but Tzolk'in is a useful reference anyway.

The Tzolk'in and Mars

3 Tzolk'ins = 1 Mars synodic period of 780 days

The Tzolk'in and the Nodal Passages

2 Tzolk'ins = 3 nodal passages (when the Moon's orbit intersects the ecliptic plane at the ascending node and the descending node), each of about 173.31 days.

Now, let's mention some of my personal interpretations on the subject:

The Tzolk'in and Saturn

I have idealized the synodic period of Saturn in the short term, this way:

Time elapsed since its first stationary position to its second stationary position = 140 days.

Time elapsed since its second stationary position to its superior conjunction (SC) = 120 days.

Time elapsed since its superior conjunction (SC) to its first stationary position = 120 days.

Therefore:

1 Tzolk'in = time from the first stationary position of Saturn to the next superior conjunction of Saturn.

1 Tzolk'in = time from the superior conjunction of Saturn to the next second stationary position of Saturn.

2 Tzolk'ins = time elapsed since the first stationary position of Saturn of the current cycle, until the second stationary position of Saturn of the next cycle.

The Tzolk'in and Jupiter

Again, I have idealized the synodic period of Jupiter in the short term, this way:

Time elapsed since its first stationary position to its second stationary position = 120 days.

Time elapsed since its second stationary position to its superior conjunction (SC) = 140 days.

Time elapsed since its superior conjunction (SC) to its first stationary position = 140 days.

Therefore:

1 Tzolk'in = time from the first stationary position of Jupiter to the next superior conjunction of Jupiter.

1 Tzolk'in = time from the superior conjunction of Jupiter to the next second stationary position of Jupiter.

2 Tzolk'ins = time elapsed since the first stationary position of Jupiter of the current cycle, until the second stationary position of Jupiter of the next cycle.

Some "new" terminology…

364 days make a computing-year, and:

13 x 28 days = 364 days

So, we are going to call this 28-day cycle "computing-month".

The Tzolk'in and Mercury

[1 Tzolk'in] – [1 computing-month] = [260 days] – [28 days] = 2 x 116 days
116 days is the canonic cycle of Mercury

The Tzolk'in and Venus Sub-Cycles

[1 Tzolk'in] + [1 computing-month] = [260 days] + [28 days] = 288 days
288 days equal the time elapsed between the superior conjunction of Venus and its next ELAST. The notation that I use for that is [SC => ELAST] = 288 days.

The Tzolk'in and the Short Interval between Eclipses

[1 Tzolk'in] – [4 computing-month] = [260 days] – [4 x 28 days] = 148 days
148 days, equal one short interval between eclipses.

And, finally:

The Tzolk'in and the Typical Interval between Eclipses

[1 Tzolk'in – 83 days] = 177 days
177 days are equivalent to one typical interval between eclipses.

[1 Tzolk'in – 82 days] = 178 days
178 days are equivalent to one "corrected" interval between eclipses.

By the way, 82 days = 3 sidereal months

The Tzolk'in and the Alternation of the Lunar Phases

[1 Tzolk'in] – [1 G-cycle] =
[260 days] – [9 days] = 251 days
8½ synodic months = 251 days
8½ x [29.529411 days] = 251 days

[1 Tzolk'in] + [1 complete cycle of the signs of the days] =
[260 days] + [20 days] = 280 days
9½ synodic months = 280 days
9½ x [29.473684 days] = 280 days

Let us now review our reference dates:

09.08.09.12.00, 1Ajaw 18 Kumk'u, is a very important date for my chronological analysis. Please take a quick look at these pages to see why:

http://independent.academia.edu/documents/0050/7088/Solucion_de_las_Series_de_Serpiente.pdf

Distance analysis in pages 47 and 49

http://independent.academia.edu/documents/0051/1447/Analisis_de_Intervalos_Cronologicos_-_Dresden_Codex_Edition.pdf

Figures in pages 142 – 146; 148 – 152; 162, 164; 166 – 173; 178

http://independent.academia.edu/documents/0050/7691/Enlaces_Cronologicos_-_Dresden_Codex_Edition.pdf

Charts in pages 4 – 6; 8 – 11; 14, 15; 29, 30; 32, 33; 35 – 41; 45 and 46

The other reference dates would be:

09.08.09.13.00, 8 Ajaw 13 Pop = K'inich Janaab' Pakal's Birth

09.08.10.07.00, 1 Ajaw 13 Mak = Common CR to Dresdensis and Palenque Chronologies

09.08.10.08.00, 8 Ajaw 13 K'ank'in = Tzolk'in Ephemeris of Pakal's Birth

09.08.10.13.00, 4 Ajaw 8 Pop = Tun Ephemeris of Janaab' Pakal's Birth

09.08.10.01.00, 11 Ajaw 13 Yaxk'in = First Third toward Tun Ephemeris of Pakal's Birth

09.08.10.14.00, 11 Ajaw 8 Wo = Previous Date + 1 Tzolk'in

09.08.09.12.00, 1Ajaw 18 Kumk'u, Date Analyses

I will mainly use mathematical notation from now on. I think the ideas will be easily followed this way:

09.08.09.12.00, 1 Ajaw 18 Kumk'u = Pakal's Birth 819-day station

09.08.09.12.00, 1 Ajaw 18 Kumk'u = full moon
09.08.09.12.00, 1 Ajaw 18 Kumk'u = [SC + 8 days] of Venus
09.08.09.12.00, 1 Ajaw 18 Kumk'u = Saturn at its first stationary position
09.08.09.12.00, 1 Ajaw 18 Kumk'u = Jupiter at its second stationary position

First symmetric pair of dates:

09.08.09.12.00 + 15 days = vernal equinox
09.08.09.12.00 – 15 days = solar eclipse (and also a Mercury-Venus-Moon conjunction)

Second symmetric pair of dates:

09.08.09.12.00 – 30 days = lunar eclipse
09.08.09.12.00 + 30 days = EFIRST of Venus

09.08.09.13.00, 8 Ajaw 13 Pop, Date Analyses

09.08.09.13.00, 8 Ajaw 13 Pop = 09.08.09.12.00, 1 Ajaw 18 Kumk'u + [20 days]
09.08.09.13.00, 8 Ajaw 13 Pop = full moon + [20 days]

So, in 9 days (one G-cycle) or maybe 10, we will reach the next full moon, depending on the lunar component -A9 or A10- of the current Supplementary Series.

09.08.09.13.00, 8 Ajaw 13 Pop = [SC + 8 days] + [20 days] = [SC + 28 days] of Venus
But, 16,380 days = 28 x 584 days + 28 days, and 584 days, is the canonic cycle of Venus.

Therefore, if we subtract 16,380 days from 09.08.09.13.00, we have to arrive at a date when Venus is near its superior conjunction:

09.08.09.13.00, 8 Ajaw 13 Pop – [16,380 days] =
09.06.04.04.00, 8 Ajaw 18 Sip = SC of Venus

09.08.09.13.00, 8 Ajaw 13 Pop = first stationary position of Saturn + [20 days]
09.08.09.13.00, 8 Ajaw 13 Pop = second stationary position of Jupiter + [20 days]

The displacement of their reference positions is barely noticeable for this date.

09.08.10.01.00, 11 Ajaw 13 Yaxk'in, Date Analyses

09.08.10.01.00, 11 Ajaw 13 Yaxk'in = 09.08.09.12.00, 1 Ajaw 18 Kumk'u + [140 days]
09.08.10.01.00, 11 Ajaw 13 Yaxk'in = full moon + [140 days]

140 days = 4¾ synodic months (½ x 9½ x 29.530588 days)
So, it is the first quarter of the moon.

09.08.09.12.00 – [30 days] = lunar eclipse
[From our second symmetric pair of dates at 09.08.09.12.00 ± 30 days]

09.08.10.01.00 – [this lunar eclipse] =
[30 days + 140 days] = 170 days

This means that perhaps a lunar eclipse will occur at the next full moon on one of these dates:

09.08.10.01.00, 11 Ajaw 13 Yaxk'in + [7 days] =
177 days from [09.08.09.12.00 – 30 days] lunar eclipse =
09.08.10.01.07, 5 Manik 0 Mol

09.08.10.01.00, 11 Ajaw 13 Yaxk'in + [8 days] =
178 days from 09.08.09.12.00 lunar eclipse =
09.08.10.01.08, 6 Lamat 1 Mol [lunar eclipse]

But,

09.08.09.12.00 – [15 days] = solar eclipse
[From our first symmetric pair of dates at 09.08.09.12.00 ± 15 days]

Hence, a solar eclipse may also occur on one of these dates:

09.08.10.01.07, 5 Manik 0 Mol + [15 days] =
177 days from [09.08.09.12.00 – 15 days] solar eclipse =
09.08.10.02.02, 7 Ik 15 Mol [solar eclipse]

09.08.10.01.08, 6 Lamat 1 Mol + [15 days] =
178 days from [09.08.09.12.00 – 15 days] solar eclipse =
09.08.10.02.03, 8 Ak'bal 16 Mol

What about Saturn and Jupiter?

09.08.10.01.00, 11 Ajaw 13 Yaxk'in = first stationary position of Saturn + [140 days]
09.08.10.01.00, 11 Ajaw 13 Yaxk'in = second stationary position of Saturn

[Second stationary position of Saturn] – [520 days] = first stationary position of Saturn
09.08.10.01.00, 11 Ajaw 13 Yaxk'in – [520 days] = 09.08.08.11.00, 11 Ajaw 3 Kumk'u

09.08.10.01.00, 11 Ajaw 13 Yaxk'in = second stationary position of Jupiter + [140 days]
09.08.10.01.00, 11 Ajaw 13 Yaxk'in = superior conjunction of Jupiter

09.08.10.07.00, 1 Ajaw 13 Mak, Date Analyses

It has been one Tzolk'in since 09.08.09.12.00, 1 Ajaw 18 Kumk'u (819-day station), and 120 days have elapsed since 09.08.10.01.00, 11 Ajaw 13 Yaxk'in.

09.08.10.07.00, 1 Ajaw 13 Mak is an important date located 16,380 days before MFIRST of Venus of 09.10.15.16.00, 1 Ajaw 8 Sak.

Again: 16,380 days = [28 x 584 days] + [28 days]
So, 09.08.10.07.00, 1 Ajaw 13 Mak = [EFIRST – 28 days]

Mars was near its superior conjunction on other Dresden Codex Base Dates as 09.08.16.16.00, 1 Ajaw 18 Wo; 09.09.09.16.00, 1 Ajaw 18 K'ayab, and, 09.08.03.16.00, 1 Ajaw 3 Xul.

The distances between those dates and 1 Ajaw 13 Mak are multiples of 2,340 days:

1 Ajaw 18 Wo – [2,340 days] = 1 Ajaw 13 Max
1 Ajaw 18 K'ayab – [3 x 2,340 days] = 1 Ajaw 13 Mak
1 Ajaw 3 Xul + [2,340 days] = 1 Ajaw 13 Mak

And,

2,340 days = 3 x 780 days = 3 times the canonic cycle of Mars

Accordingly, on 09.08.10.07.00, 1 Ajaw 13 Mak, Mars should be near its superior conjunction.

09.08.10.07.00, 1 Ajaw 13 Mak = 09.08.10.01.00, 11 Ajaw 13 Yaxk'in + [120 days]
09.08.10.01.00, 11 Ajaw 13 Yaxk'in = second stationary position of Saturn
[Second stationary position of Saturn] + [120 days] = superior conjunction of Saturn

At this time, Jupiter is about 20 days to reach its first stationary position.

09.08.10.08.00, 8 Ajaw 13 K'ank'in, Date Analyses

09.08.10.08.00, 8 Ajaw 13 K'ank'in = 09.08.09.12.00, 1 Ajaw 18 Kumk'u + [280 days]
09.08.09.12.00, 1 Ajaw 18 Kumk'u = full moon
09.08.10.08.00, 8 Ajaw 13 K'ank'in = full moon + [280 days]

[280 days] = 9½ synodic months

So, it is new moon on 09.08.10.08.00, 8 Ajaw 13 K'ank'in.

Saturn is about 20 days after its superior conjunction, and Jupiter should be located at its first stationary position.

Consequently, if we move forward in time two Tzolk'ins until the date 09.08.11.16.00, 8 Ajaw 3 Sotz', Jupiter should be located at its second stationary position.

09.08.10.08.00, 8 Ajaw 13 K'ank'in = 09.08.09.12.00, 1 Ajaw 18 Kumk'u + [280 days]
09.08.09.12.00, 1 Ajaw 18 Kumk'u = [SC + 8 days] of Venus

09.08.10.08.00, 8 Ajaw 13 K'ank'in = [SC + 288 days]
09.08.10.08.00, 8 Ajaw 13 K'ank'in = ELAST of Venus

09.08.10.13.00, 4 Ajaw 8 Pop, Date Analyses

On 09.08.10.13.00, 4 Ajaw 8 Pop, occurs a vernal equinox (it is the Haab anniversary of 09.08.09.12.00 + 15 days) and, Saturn should be located at its first stationary position because:

09.08.10.13.00, 4 Ajaw 8 Pop = 09.08.10.07.00, 1 Ajaw 13 Mak + [120 days]
09.08.10.07.00, 1 Ajaw 13 Mak = superior conjunction of Saturn
[Superior conjunction of Saturn] + [120 days] = first stationary position of Saturn

Therefore, 520 days after 09.08.10.13.00, 4 Ajaw 8 Pop, on the Maya date 09.08.12.03.00, 4 Ajaw 3 Ch'en, Saturn should be located at its second stationary position.

09.08.10.14.00, 11 Ajaw 8 Wo, Date Analyses

On this date, 400 days have elapsed since the 819-day station of 09.08.09.12.00, 1 Ajaw 18 Kumk'u.

The day before, on 09.08.10.13.19, 10 Kawak 7 Wo, Jupiter should be located at the same synodic position it was on 09.08.09.12.00, 1 Ajaw 18 Kumk'u (second stationary position), and Saturn should be now undergoing retrograde motion, 20 days after its first stationary position. But,

What about the moon?

Well; It should be a new moon, of course.

How could we know that?

Because:

09.08.09.12.00, 1 Ajaw 18 Kumk'u = full moon
09.08.09.12.00, 1 Ajaw 18 Kumk'u + 399 days =
09.08.10.13.19, 10 Kawak 7 Wo

And:

398.66 days [almost one synodic period of Jupiter] =
13½ x 29.530588 days [alternation of the lunar phase]

Similarly:

[MFIRST => IC] of Venus = [584 days] – 4 days = [576 days] + 4 days = 580 days

And:

[580 days] / [5 cycles] = 116 days per cycle [canonic cycle of Mercury]