How to get the split ratio around an 819-day station, by Carlos Barrera A. (CBA)

I first proposed this simple concept some years ago.

It has proved of great value in Maya chronological analysis.

Step 1: Select your Maya date

Step 2: Get the number of days elapsed since 0.0.0.0.0, 4 Ajaw 8 Kumk'u

Step 3: Add three more days to the number obtained in step 2. [The nearest 819-day station to 4 Ajaw 8 Kumk'u is three days away from it, in the previous Era]

Step 4: Divide the result you got in step 3, by 819.

Step 5a: If you get a round [integer] number: Congratulations! You are located at an 819-day station!

Step 5b: If you get a decimal component, "put away" the integer number and …

Step 6: Multiply the decimal component by 819. The result is your first split ratio component.

Step 7: Substract 819 from your first split ratio to get the second split ratio component.

Step 8: You're done.

Example:

Step 1: I selected the date 9.9.9.16.0, 1 Ajaw 18 K'ayab.

Step 2: Number of days elapsed since 4 Ajaw 8 Kumk'u:
[9 x 144,000 + 9 x 7,200 + 9 x 360 + 16 x 20 + 0 x 1] = 1,364,360 days.

Step 3:
We add three more days:
[1,364,360 + 3] days = 1,364,363 days

Step 4:
[1,364,363 / 819] = 1,665.88888888

Step 5b:
1,665.8888888 – 1,665 = 0.888888

Step 6:
0.888888 x 819 days = 728 days

Step 7:
[728 – 819] day = – 91 days

Step 8:
Your split ratio is [728 : 91] days

What this means is that the date 9.9.9.16.0, 1 Ajaw 18 K'ayab, happened 728 days after an 819-day station [Ef.819d + 728d], and 91 days before an 819-day station [Ef.819d – 91d].

[Ef.819d, stands for "819-day station ephemeris" (*Efemérides,* in Spanish)]

Applications and Specific Facts:

How did I know that the peculiar number 1.5.5.0 (9,100 days) will lead to an 819-day station?

9,100 equals eleven 819-day cycles, plus 91 days:

[11 x 819 days] + 91 days = 9,100 days

And, 9.9.9.16.0, 1 Ajaw 18 K'ayab, happened 91 days before an 819-day station [Ef.819d – 91d], so:

9.9.9.16.0 + 1.5.5.0 = 9.10.15.3.0, 1 Ajaw 13 Pax [819-day station]

-Let's check this out:

[9 x 144,000 + 10 x 7,200 + 15 x 360 + 3 x 20 + 0 x 1] days = 1,373,460 days

[1,373,460 + 3] days = 1,377,463 days

[1,373,463 / 819] = 1,677

[We got an integer number, so this is an 819-day station, and we're done]

How did I find out that [Ef.819d – 104d] were important computing points?

The distance between 9.8.9.12.0, 1 Ajaw 18 Kumk'u [819-day station] and, 9.10.15.3.0, 1 Ajaw 13 Pax [819-day station], equals 16,380 days, and these two 819-day stations happened 260 days before other relevant dates:

9.10.15.3.0 + 13.0 = 9.10.15.16.0, 1 Ajaw 8 Sak [MFIRST of Venus]

9.8.9.12.0 + 13.0 = 9.8.10.7.0, 1 Ajaw 13 Mak [Common Calendar Round to Palenque Chronology and Dresden Codex Base Dates]

But, …

16,380 days = 63 x **260** days = 45 x **364** days

So I thought: If we had to stop one Tzolk'in [**260** days] before the final date 9.10.15.16.0, to get the 9.10.15.3.0, 819-day station, What would have happened if we had stopped **364** days before that same date [9.10.15.16.0 – 1.0.4]?

Well; we had arrived to a date where the G(F) and Z(Y) components of the Supplementary Series, and the Tzolk'in numeric coefficient were minimal [G= 1, Z= 1 and # = 1], and…

We would have recreated a [104 days : 260 days] ratio around this 9.10.15.3.0 station.

Why could we say that Mars Table lub [9.19.7.15.8, 3 Lamat 6 Sotz'] and Eclipse Table lub [9.16.4.10.8, 12 Lamat 1 Muan] are symmetrical?

Let's get Mars Table lub Split Ratio:

[9 x 144,000 + 19 x 7,200 + 7 x 360 + 15 x 20 + 8 x 1] days = 1,435,628 days;

[1,435,628 + 3] days = 1,435,631 days;

[1,435,631 / 819] = 1,752.907204;

[1,752.907204 – 1,752] = 0.907204;

[0.907204 x 819] days = **743** days;

[743 – 819] days = **– 76** days.

Then: 9.19.7.15.8, 3 Lamat 6 Sotz' = [Ef.819d **+ 743**d] = [Ef.819d **– 76**d] = [**743 : 76**] days

Now, let's check the other lub [Eclipse Table Base Date]:

[9 x 144,000 + 16 x 7,200 + 4 x 360 + 10 x 20 + 8 x 1] days = 1,412,848 days;

[1,412,848 + 3] days = 1,412,851 days;

[1,412,851 / 819] = 1,725.092796;

[1,725.092796 – 1,725] = 0.092796

[0.092796 x 819] days = **76** days;

[76 days – 819] days = **– 743** days.

Then: 9.16.4.10.8, 12 Lamat 1 Muan = [Ef.819d **– 743d**] = [Ef.819d **+ 76**d] = [**76**d : **743**d]

Why did I suspect that Serpent Dates and the 37,960-day structure that I proposed in my first publication might be related?

First Clue:

9.10.15.16.0, 1 Ajaw 8 Sak, was the "target point" of the 37,960-day structure

9.10.15.16.0 – 37,960 days = 9.5.10.8.0, 1 Ajaw 8 Sak, was the "source point" of that same 37,960-day structure

9.5.10.8.0 + (**405** x 365 days) = 10.6.1.1.5, 3 Chikchan 8 Sak, [a Serpent Date], and…

10.6.1.1.5, 3 Chikchan 8 Sak = [Ef.819d + **379**d]

But, **379** days, is almost the same Saturn synodic period of **378.09** days, and …

11,960 days / **405** cycles = one lunation

- Coincidence?

- I was not sure… Let's keep on researching…

Second Clue:

If we add (again) 405 Jaab's to the 819-day station we mentioned before [9.10.15.3.0], then we get another Serpent Date:

9.10.15.3.0 + (**405** x 365 days) = 10.11.5.14.5, 3 Chikchan 13 Pax, and …

10.11.5.14.5 = [Ef.819d + **405**d]

Therefore, 10.11.5.14.5 – 819 days = 10.11.4.12.0, 1 Ajaw 13 K'ank'in [**819-day station**]

But, our source date of the 37,960-day structure [9.5.10.8.0], plus **185,120** days [a peculiar number written in page 24 of the Dresden Codex], also equals that same 819-day station:

9.5.10.8.0 + **185,120** days = 10.11.4.12.0, 1 Ajaw 13 K'ank'in [the same **819-day station**]

Third Clue:

9.10.15.16.0 + (**301** x 365 days) = 10.6.1.1.5, 3 Chikchan 8 Sak, [the same Serpent Date we got before], and…

The 175,760-day interval proposed by Teeple also equals **301** Venus synodic periods.

Fourth Clue:

When we apply other peculiar numbers written in page 24 of the Dresden Codex to our target date, we get the following split ratios:

9.10.15.16.0 + **33,280** days = [**780** days : **39** days]

[**780** days, is the synodic period of Mars, and, **39** days, is the distance between equinoxes and zenithal passages in some mesoamerican zones]

9.10.15.16.0 + **68,900** days = [**364** days : (**364** days + **91** days)]

Apparently, those dates were carefully selected by Maya astronomers.

This is why I proposed to apply the 175,760-day Teeple interval, to the Maya date 9.10.15.16.0, this way:

9.10.15.16.0 + [**68,900** + 37,960 + 68,900] days =
10.15.4.2.0, 1 Ajaw 18 Uo [MFIRST of Venus]

In fact, we would have gotten that same date if we had applied this other alternation of cycles:

9.10.15.16.0 + [**33,280** + 37,960 + 33,280 + 37,960 + 33,280] days =
10.15.4.2.0, 1 Ajaw 18 Uo [MFIRST of Venus], and…

Another solution could have been:

9.10.15.16.0 + [**33,280** + 37,960 + 33,280] =
10.5.6.4.0, 1 Ajaw 18 K'ayab [MFIRST of Venus]

Fifth Clue:

There were another interesting Serpent Dates like these:

First Date: 8.16.3.12.3, 13 Ak'bal 11 Yaxk'in = [Ef.819d – **105**d]

Where the G(F) and Z(Y) components of the Supplementary Series, and the Tzolk'in numeric coefficient were maximal [G= 9, Z= 7 and # = 13]

Second Date: 10.6.10.6.3, 13 Ak'bal 1 K'ank'in = [Ef.819d – **378**d]

[**378** days, equals one Saturn canonic cycle.]

Third Date: 9.13.10.15.14, 9 Ix 12 Muan = [Ef.819d + **398**d]

[**398** days, is very close to Jupiter synodic period of **398.88** days.]

As a matter of fact, this last date was the key to "discover" the relationships among Serpent Dates and other Palenque dates, as we'll see…

Why did I suspect that Saturn and Jupiter retrograde motion, and their stationary positions, might be related with Serpent Dates and Palenque Chronologies?

First: In 2.008, I proposed an "archetypical interval" of [11 x 3,276 days] + 260 days, starting at 9.8.9.12.0, 1 Ajaw 18 Kumk'u [819-day station], and ending at 9.13.10.8.16, 1 Kib 14 Mol, [Ef.819d + **260**d].

Second: Floyd Glenn Lounsbury had pointed out that 9.13.10.8.16, and other dates related with K'an Bahlam of Palenque were moments where Jupiter was located at its second stationary position.

Third: In the other hand, we had that, Serpent Date 9.13.10.15.14, 9 Ix 12 Muan, [Ef.819d + **398**d], was projected 138 days after our target date 9.13.10.8.16, [Ef.819d + **260**d]:

9.13.10.15.14 – 9.13.10.8.16 = 6.18 = **138** days

What did it all mean?

By reading the Aveni's book *Skywatchers (2.001),* I found a table in page 87, with these mean intervals in retrograde motion for Jupiter and Saturn:

Júpiter: 120 days
Saturn: **140** days

If Jupiter synodic period equals 398.88 days, and it is around the time of opposition that Jupiter undergoes retrograde motion, then:

398.88 days – 120 days = 278.88 days, …

represented the time that Jupiter underwent direct motion, and:

½ x 278.88 days = **139.44** days, …

represented the time needed for Jupiter to reach its Superior Conjunction, starting from its second stationary position.

As we mentioned it, on 9.13.10.8.16, Jupiter was located at its second stationary position, hence, on Serpent Date 9.13.10.15.14, it should have happened a Jupiter Superior Conjunction, but…

What about Saturn?

By using the freeware *StarCalc 5.73* by Alexander Zavalishin, I noticed that Saturn was located at its second stationary point, on the date 9.13.10.15.14, 9 Ix 12 Muan.

This meant that **138** days before this date, on 9.13.10.8.16, 1 Kib 14 Mol, [Ef.819d + **260**d], Saturn should have been located at its first stationary position!!!

But, my "archetypical interval" of [11 x 3,276 days] + 260 days, not only equated 91 Jupiter synodic periods, but also, 96 Saturn synodic periods, so…

9.8.9.12.0, 1 Ajaw 18 Kumk'u, 819-day station, should have been a date where Jupiter was located at its second stationary position, and Saturn was located at its first stationary position.

Astronomical simulations confirmed these theoretical conclusions.

Finally, I compared these dates, and other Lounsbury's dates, with another Serpent and Ring Dates and, I noticed that many of them happened at distances that were multiples of Jupiter and Saturn synodic periods.

This way, I found those Serpent Dates where Saturn was in (or near) its first and second stationary positions, and Jupiter was in its second stationary positions.

The remaining (serpent) dates corresponded to first stationary positions of Jupiter.

At last, we had an astronomical criterion for these Serpent and Ring Dates Solutions.

[Other details are mentioned in the document *Serpent and Ring Dates Solutions*.]

[The "archetypical interval" was disscused in the document *Análisis de Intervalos de Separación Relativa en la Cronología Maya de Palenque*.]

[The 37,960-day structure, that arises from the date 9.5.10.8.0, 1 Ajaw 8 Sak, and other solutions, were suggested in *Dos Posibles Soluciones para el Intervalo de 9.100 días (Notación Maya 1.5.5.0) de la Tabla de Venus del Códice de Dresde (Códex Dresdensis)*.]