

# Moses' Calendar

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**ABSTRACT.** A 7-day week justifies an use of a solar calendar for Jews. A rare prayer, *Birkat Hachama*, Leviticus and Odyssey book XII confirm such a hypothesis; also Exodus 26 and Psalm 90 have logical ties with solar computations. Adding a whole week once every 28 years, 1,120 years and 62,720 years we can reach a perfect value of the sidereal solar year, using a unique 7-year calendar, whose years can be named like the days of the week.

## Introduction

In ancient times Jews certainly had a solar calendar. The structure of the 7-day week has in its own right univocal ties with the vague year, built on 365 days: the peculiarity is that the year welcome day and the year farewell day<sup>1</sup> coincide with the same day of the week (fig. 1), because 7 is sub multiple of 364 ( $7 \times 52 = 364$ )<sup>2</sup>.

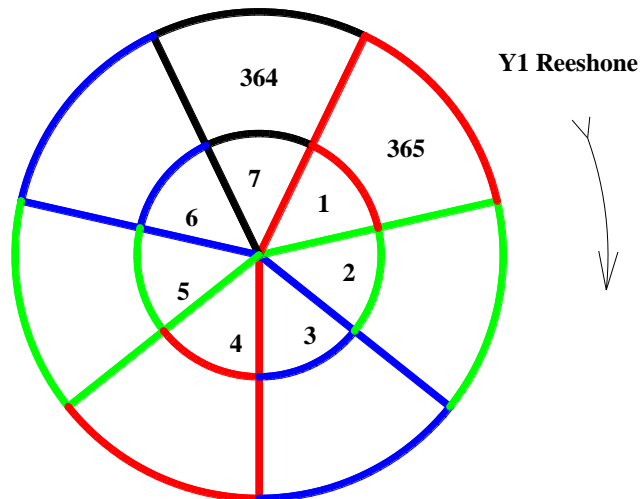


Figure 1

So we have only seven typologies of years (fig. 2), from Y1 *Reeshone*-year, which starts and ends with *Reeshone* day, to Y7 *Shabbat*-year, which starts and ends on *Shabbat*, passing through Y2 *Shaynee*-year, Y3 *Shlee'shee*-year, Y4 *Revee'ee*-year, Y5 *Khah'mee'shee*-year and Y6 *Ha'shee'shee*-year.

The Hebrew week, not common in ancient Mediterranean civilizations (looking, for example, at Nuragics and Egyptians with their 10-day week), directly leads to a year with thirteen 28-day months (each one with 4 weeks) plus one day<sup>3</sup>; such typical months have to be named *Hebrew months*<sup>4</sup>.

<sup>1</sup> The first and the last day of the year.

<sup>2</sup> Such a similar strategy characterizes another great Mediterranean civilization, the Nuragic one, with fourteen 26-day months per year ( $14 \times 26 = 364$ ). The Mayan, with their Tzolk'in, had the same result using twenty-eight periods each one with 13 days ( $28 \times 13 = 364$ ).

<sup>3</sup>  $13 \times 28 + 1 = 364 + 1 = 365$ .

<sup>4</sup> First Passover falls the 14<sup>th</sup> night of the first month (Exodus 12, 2-6), simply because it coincides with half month ( $28/2 = 14$ ); and the feast of tabernacles begins the 15<sup>th</sup> day of the 7<sup>th</sup> month because exactly half an year has gone by. The verse "Over the course of ten months, I took shape from her blood, ..." (Wisdom 7,2) is another important track of this month: a pregnancy is well related with 280 days  $10 \times 28 = 280$ ).

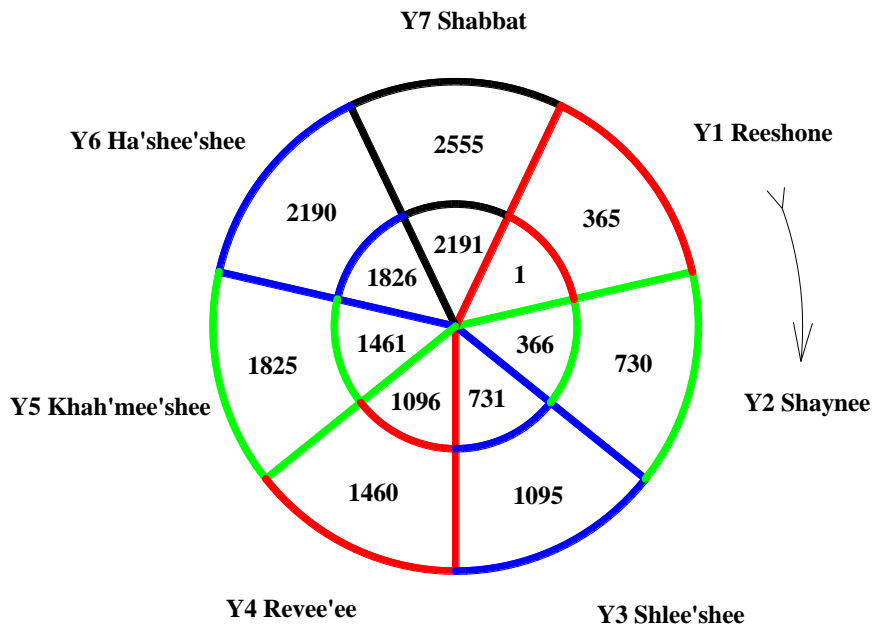


Figure 2

### Birkat Hachama

As days and years have the same rhythm and the same name, on the 28<sup>th</sup> year, which is a *Shabbat*-year (fig. 3), inserting a whole week more (thereby obtaining 372 days) we have a year perfectly identical with the Julian one ( $(28 \times 365 + 7) / 28 = 365.25$ ). Evidence of the extreme importance of the 28-year cycle for Jews is a rare prayer, *Birkat Hachama* that recurs only once every 28 years. It is a wonderful prayer, blessing the sun, performed to mark the sun's return to the position it was in at the time of creation:

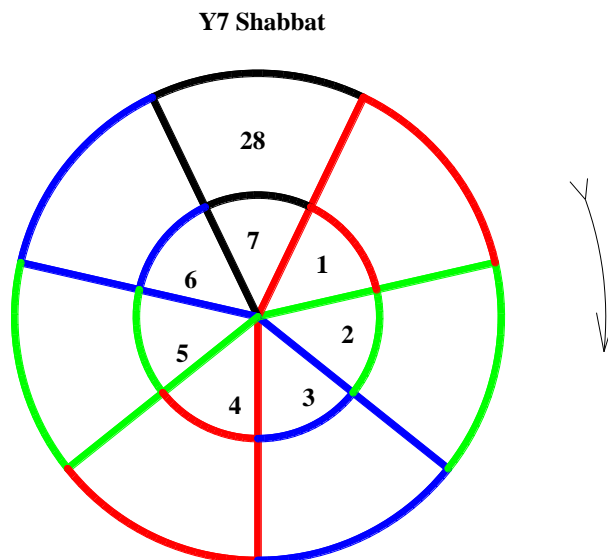


Figure 3

“One who sees the sun at its turning point, should say “Blessed be He who reenacts the creation”. When is this? Every 28 years when the cycle begins again, and the Nissan equinox falls in Saturn, on the evening of Tuesday going into Wednesday ...”

Inserting a week once every 28 years and not a day once every 4 years, as suggested by Julian criteria, allows for preserving the harmonic rhythm of years on the names of the days; this will be better understood in the next sections. What's more in 28 years we have 364 ( $28 \times 13 = 364$ ) Hebrew months plus 28 days, that is another month, giving globally 365 months; whilst considering that a further week must be inserted we obtain 365.25 months<sup>5</sup>. This spectacular trick of coincidence between days (of year) and months (of 28-year cycle) reveals a superb calendar architecture. Luckily it is unanimously accepted that Hebrew knowledge on solar cycle has at least the same accuracy as that of the Julian calendar! But there is much, much more to say ...

## Jubilee Long Cycle

On Leviticus (25, 8-10) we can read:

*You are to count seven Shabbat years, seven times seven years, that is forty nine years ...  
and you are to consecrate the fiftieth year, ....*

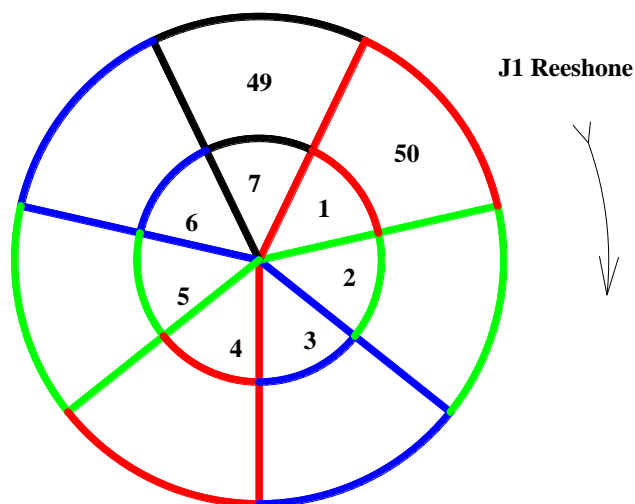


Figure 4

Figure 4 shows the first fiftieth year, that's to say the first Jubilee, which has a *Reeshone* typology, while Figure 5 shows that 50-year periods have the same rhythm of the days of the week. So we still have seven different jubilees, from the first J1, which falls in a year starting and ending with the *Reeshone* day, to the seventh J7 *Shabbat* jubilee, a year which starts and ends on *Shabbat*, passing through J2 *Shaynee*, J3 *Shlee'shee*, J4 *Revee'ee*, J5 *Khah'mee'shee* and J6 *Ha'shee'shee* jubilees. It must be clear that all 50-year periods begin and end with the same year typology (1<sup>st</sup> and 50<sup>th</sup> year are Y1, 51<sup>st</sup> and 100<sup>th</sup> are Y2, 101<sup>st</sup> and 150<sup>th</sup> are Y3, 151<sup>st</sup> and 200<sup>th</sup> are Y4, 201<sup>st</sup> and 250<sup>th</sup> are Y5, 251<sup>st</sup> and 300<sup>th</sup> are Y6 and 301<sup>st</sup> and 350<sup>th</sup> are Y7). It is easily understandable that such a biblical harmony (obtained by simply inserting a week once every 28 years) would be broken by Julian or Gregorian rude insertions<sup>6</sup>. On the 14<sup>th</sup> jubilee, that's to say once every 700 years, there is a coincidence with the 28-year cycle<sup>7</sup>. So a 700-year cycle has a strategic importance; we can name it *Jubilee Long Cycle*.

<sup>5</sup> 1 week =  $7/28 = 0.25$  Hebrew month.

<sup>6</sup> Whoever pretends to have a jubilee once every 25 years is thoroughly wrong, because in such a way he destroys the jubilee harmony.

<sup>7</sup>  $28 \times 25 = 14 \times 50 = 700$ .

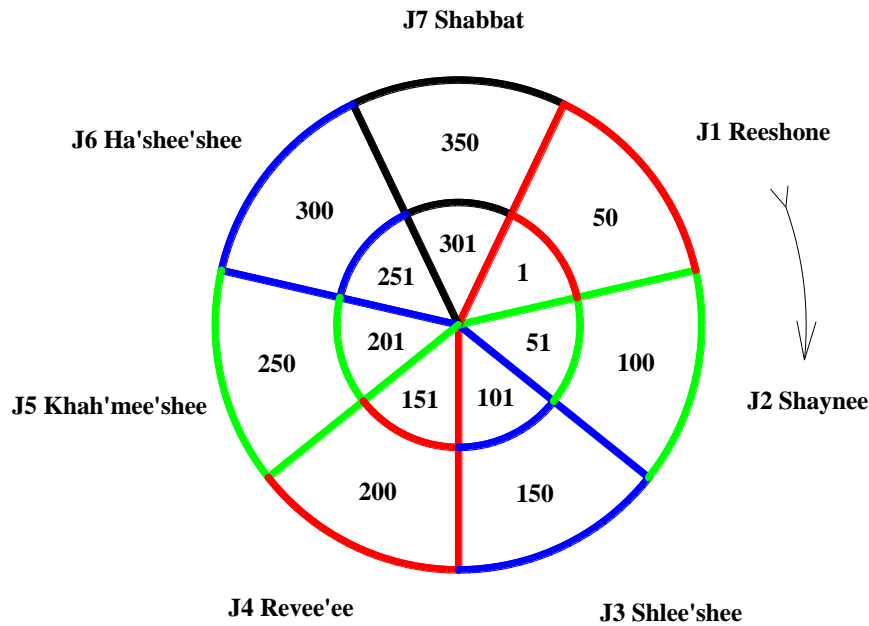


Figure 5

## The Hebrew Island

In a Greek mythological frame Odyssey Book XII introduces many typical topics of Hebrew culture. We can see traces of the 7-day week in verses<sup>8</sup>:

*For six days my men  
kept driving in the best cows and feasting upon them,  
but when Jove had added a seventh day ...*

Besides that in Thrinacian island there are<sup>9</sup>:

*many herds  
of cattle and flocks of sheep belonging to the sun-god,  
seven herds of cattle and seven flocks of sheep,  
with 50 heads in each one. They do not breed,  
nor do they become fewer in number ...*

If we set down each cow or sheep as symbolizing a whole year, something interesting emerges. First of all each herd or flock with 50 heads is coupled with a 50-year period which implies a jubilee; second we obtain a 700-year cycle (because  $7 \times 50 \text{ cows} + 7 \times 50 \text{ sheep} = 350 \text{ cows} + 350 \text{ sheep} = 700 \text{ years}$ ), which is an important Hebrew cycle as stated above<sup>10</sup>. However sheep are smaller than cows: how can we explain this? In the first 350 years we have 12 insertions of a week once every 28 years, while in the second 350 years we have 13 of such insertions<sup>11</sup>. This leads in the first case to a 365.24-day *sheepyear* ( $((365 \times 350 + 12 \times 7) / 350 = 365.24)$ ) and in the second one to a 365.26-day *cowyear* ( $((365 \times 350 + 13 \times 7) / 350 = 365.26)$ ). This notable conceptual difference is marked by the different size existing between sheep and cows!

<sup>8</sup> Odyssey, XII, 397-399.

<sup>9</sup> Odyssey, XII, 127-131.

<sup>10</sup> Someone thinks that Thrinacian island refers to Egypt. He is wrong because Egyptian jubilee is associated with 30-year cycles.

<sup>11</sup>  $12 \times 28 + 13 \times 28 = 336 + 364 = 700$ .

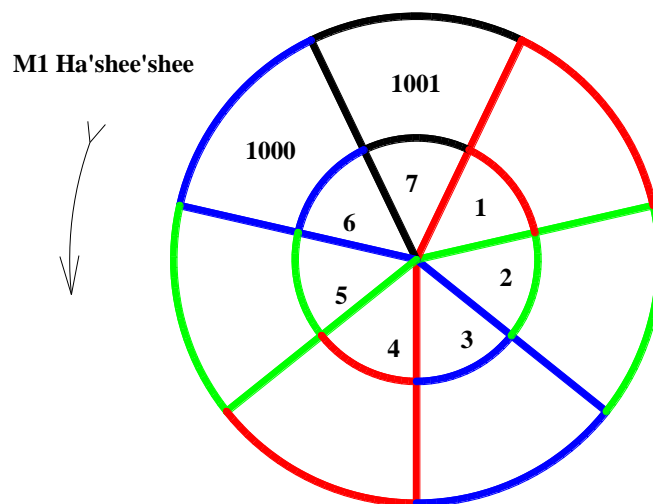
One last addition that must be made deals with the triangular shape of Thrinacian island, the same shape of the *yod*, the symbol for the eye of God. As a matter of fact if we had to choose a Mediterranean island for symbolizing the *yod*, shouldn't we be forced to think about Sicily? Isn't, perhaps, Hebrew culture the largest important island in ancient Mediterranean environment? And why does Odysseus encounter the classical Mediterranean rhythm, the 10-day week, only when he leaves the Thrinacian island<sup>12</sup>?

*Hence I was carried along for nine days till on the tenth night  
The gods stranded me on the Ogygian island.*

### The Astronomer Psalmist

We can understand now the obscure verse 4 of Psalm 90:

*From your viewpoint a thousand years are merely like yesterday or a night watch.*



*Figure 6*

Why exactly yesterday and not any other day? And why a night watch? Yesterday gives a feeling of retrograde motion while the most important night watch, *Shabbat Eve*, puts “a thousand years”, that is to say the first millennium M1 on the sixth day. As a matter of fact the thousandth year has a *Ha'shee'shee* typology (fig.6), because 7 is a sub multiple of 1001. Moving backwards, **yesterday by yesterday**, we find the last millennium M7 with a *Shabbat* typology passing through M2 *Khah'mee'shee*, M3 *Revee'ee*, M4 *Shlee'shee*, M5 *Shaynee* and M6 *Reeshone* millennia (fig.7).

This retrograde motion surely has given rise to the Phoenix' myth<sup>13</sup>.

So the Psalmist was perfectly aware of the harmonic functionality of the Hebrew solar calendar: his knowledge is that of an expert astronomer.

<sup>12</sup> Odyssey, XII, 447-448.

<sup>13</sup> Some Rabbis think that 1,000-year cycles have ties with the Phoenix. Rabbi Shelomo Yitzhaki had this to say concerning the Phoenix: “It is a bird whose name is *chol*, and death has no power on it, because it did not taste the fruit from the tree of knowledge. At the end of thousand years it renews itself, and returns to his youth”.

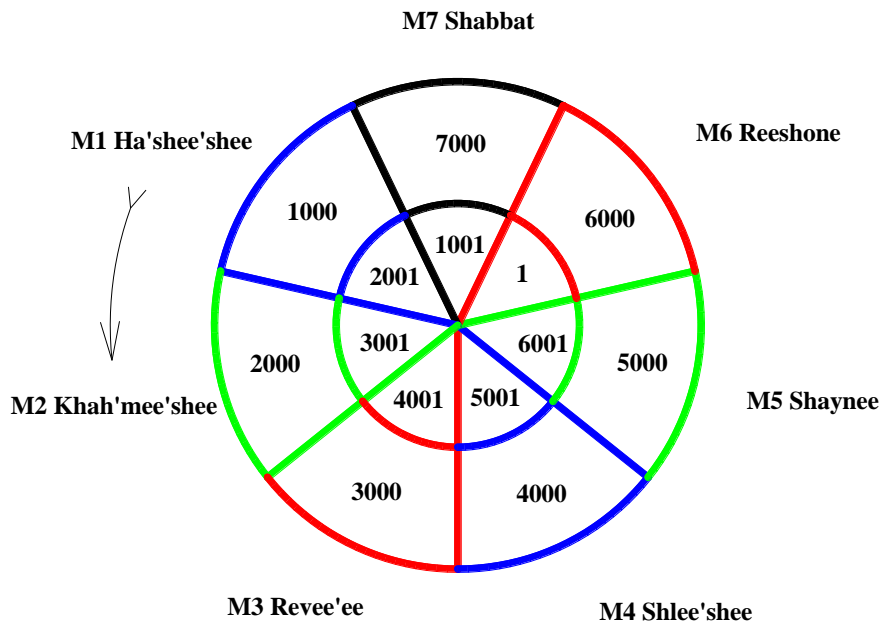


Figure 7

## The Tabernacle Year

On Exodus (26, 1-6) we read:

*Make the tabernacle with 10 curtains of finely linen and blue, purple and scarlet yarn ...  
All the curtains are to be the same size, 28 cubits long and 4 cubits wide ...  
Fasten the curtains together so that the tabernacle is a unit.*

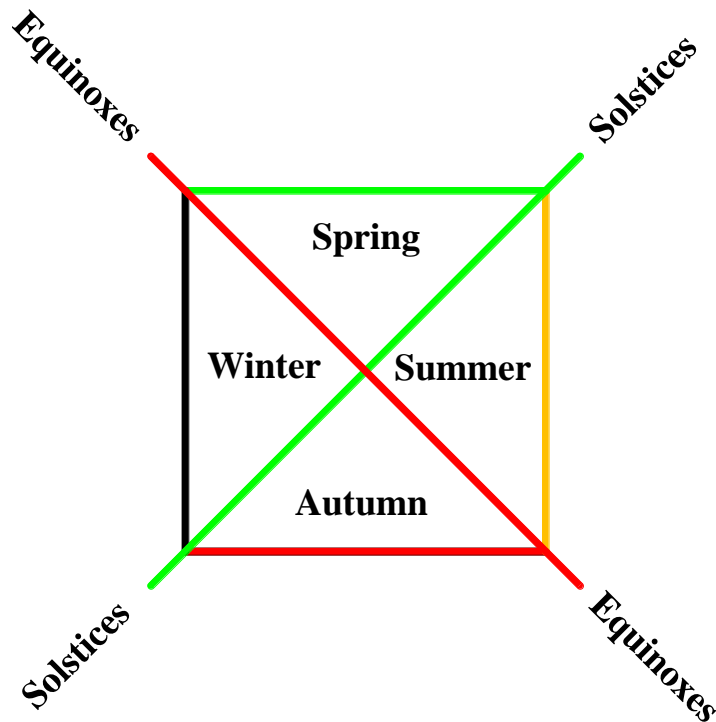


Figure 8

The colours white of linen and blue, purple and scarlet of yarn have logical ties with the light of the sun and the sky in the various sun lights (from the sunrise to the sunset). As the cubit is a length

unit, assuming one square cubit as a cycle equaling one solar year<sup>14</sup> is fascinating because we can recognize solstices and equinoxes on the diagonal directions (fig. 8), while each of the four triangles represents a season. In such a way we discover an amazing astronomical knowledge; first of all each curtain symbolizes a 112-year cycle ( $28 \times 4 = 112$ ), an important partial cycle, because in such a period, as stated above, we must insert 28 days ( $7 \times 4 = 28$ ), that's to say a whole Hebrew month! Besides that 112 years are made up of 1461 months<sup>15</sup>; if we continue to consider the game day-month we can deduce a perfect knowledge of the leap year ( $4 \times 365 + 1 = 1461$  days). But the 10 curtains are fastened "together so that the tabernacle is a unit", so we are forced to consider that the entire cycle ( $10 \times 112 = 1,120$ ), a 1,120-year cycle, does indeed refer to the sun. As a consequence of that we must insert a whole week more once every 1,120 years. Such a similar choice gives a year with:

$$(1,120 \times 365.25 + 7) / 1,120 = 365.25625 \text{ days.}$$

We must name such a year *Tabernacle* year: it is a quasi sidereal year, because it is very close by the sidereal solar one, fixed in our encyclopedias on 365.25636 days<sup>16</sup>.

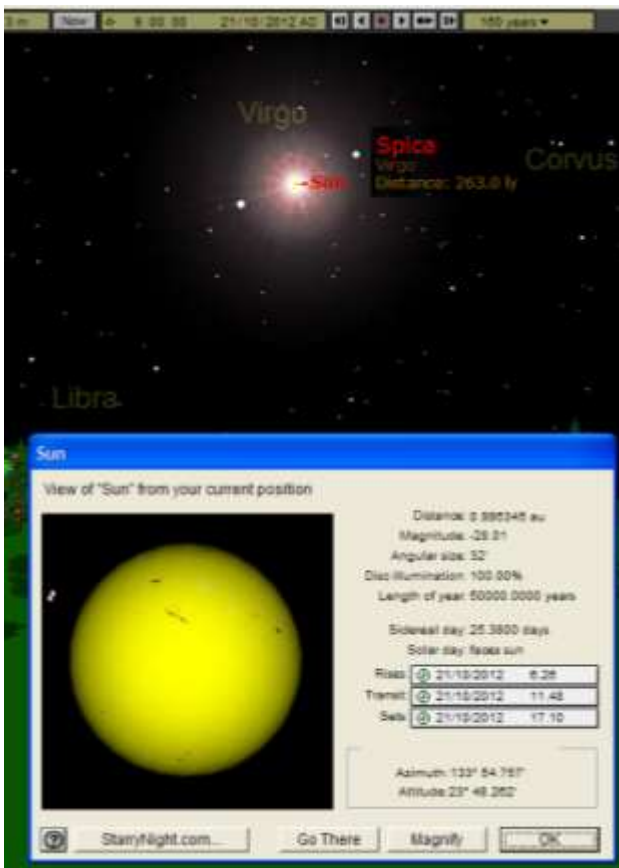


Figure 9

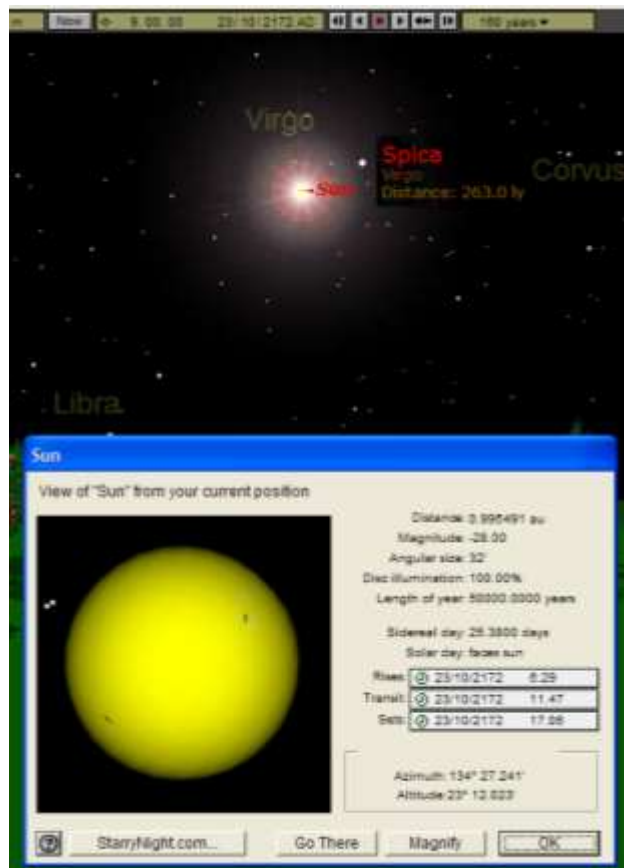


Figure 10

As 28 years hide the basic 4-year cycle ( $28/7=4$ ), linked in the leap year, 1,120 years have to be related with a strategic 160-year cycle ( $1,120/7=160$ ) which has a strong astronomical pregnancy. As a matter of fact in 160 *Tabernacle* years we have a considerable realignment of the sun with the fixed stars. Figure 9 shows the sun between Spica (Virgo) and Libra; after 58,441 days

<sup>14</sup> All the measures in cubits of Exodus 26 have astronomical pregnancy. This will be subject for another investigation.

<sup>15</sup> 28 years contain 365.25 months as stated above, so that  $365.25 \times 4 = 1461$ .

<sup>16</sup> The difference between the sidereal year (365.25636 days) and the Tabernacle Year (365.25625 days) is about 9.5 seconds ( $0.00011 \times 24 \times 3600 = 9.504$ )!

( $160 \times 365.25625 = 58,441$ ) the sun joins again the same constellations in a quite similar position (fig. 10). Besides that in 160 *Tabernacle* years we have 1,979 moons so that the Hebrew synodic moon cycle assumes the value 29.530571 days ( $58,441/1,979 = 29.530571$ ) which is amazingly close by 29.53059 registered on our encyclopedias. The location of the moon between Aries and Pleiades (Taurus) (fig. 11) is spectacularly repeated after 160 *Tabernacle* years (fig. 12). Just the same position with regards to the fixed stars suggests that we analyze the sidereal moon cycle with its accurate value of 27.32164 days, because in 58,441 days we have 2,139 sidereal moons ( $58,441/2,139 = 27.32164$ ), while our scientists use 27.32166 days! So 160 *Tabernacle* years perfectly harmonize the synodic and sidereal moons.



Figure 11



Figure 12

These data must not be underestimated; it is necessary to emphasize that only the *Tabernacle* year has in its own right these wonderful results, because 160 Julian years are made up of 58,440 days, whilst about 58,439 days are equivalent to 160 Gregorian years<sup>17</sup>. It goes without saying that the best astronomical model has been thought up by the Jews!

The 160-year cycle paints in a 1,120-year one a particular *menorah* (fig. 13); so these advanced astronomical notions could even have given rise to particular patterns in ancient Jewish textile sector.

If we consider the identity:

$$25 \times 1,120 = 40 \times 700 = 28,000 \text{ years}$$

we can easily observe that 1,120-year cycles coincide with 700-year ones every 28,000 years, that's to say every 40 *Jubilee Long Cycles*; it seems unnecessary to remind the reader of the extreme

<sup>17</sup> We should obviously have wrong values, e. g., for synodic moon cycle: 29.530066 ( $58,440/1,979 = 29.530066$ ) for the Julian year and, worse, 29.52956 ( $58,439/1,979 = 29.52956$ ) for the Gregorian one.



importance of the number 40 in Hebrew tradition. This wonderful coincidence directly derives from the sapient structure of jubilees built on 50-year periods. Let's consider, at last, the parallelism between 28 years and 28,000 years: it is really fascinating! If 28 years contain 365.25 Hebrew months then 28,000 years are made up of 365,250 months plus 25 weeks (added every 1,120 years), in equivalence with 175 days ( $7 \times 25 = 175$ ) or 6.25 Hebrew months ( $175/28 = 6.25$ ). So in 28,000 years we have 365,256.25 months; this number has the same significant digits of the days in a *Tabernacle* year, with a simple triple shifting of the decimal point!

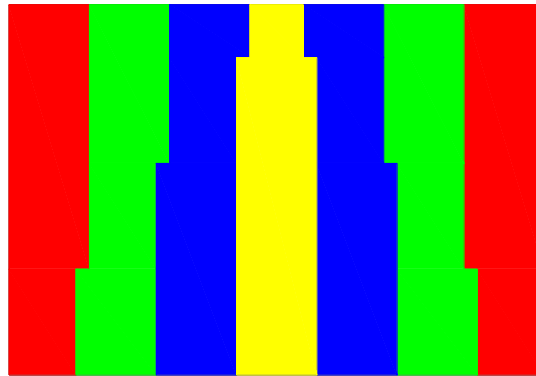


Figure 13

### Hebrew Perpetual Calendar

The last step, perhaps not having deep roots in Bible<sup>18</sup> or Hebrew tradition (it is still an open question mark!) allows us to obtain a wonderful perpetual calendar. If we use a criterion derived from Incan calendar (De Pasquale 2011), that's to say if we insert a whole week more once every 62,720 years we obtain a year with:

$$(62,720 \times 365.25625 + 7) / 62,720 = 365.2563616 \text{ days,}$$

a perfect value of the sidereal solar year! We should have a unique and repeatable 7-year calendar containing all the year typologies: Y1 *Reeshone*, Y2 *Shaynee*, Y3 *Shlee'shee*, Y4 *Revee'ee*, Y5 *Khah'mee'shee*, Y6 *Ha'shee'shee* and Y7 *Shabbat*. Every year would have only 365 days, but we must take care of inserting:

- 7 days once every 28 years, obtaining 372 days (53 weeks plus 1 day) for 28<sup>th</sup> years,
- 14 days once every 1,120 years, with 379 days (54 weeks plus 1 day) for 1,120<sup>th</sup> years,
- 21 days once every 62,720 years, with 386 days (55 weeks plus 1 day) for 62,720<sup>th</sup> years<sup>19</sup>.

We feel it our duty to simply name such a calendar a "Moses' Calendar", because it clearly grows in Hebrew patriarchal cultural humus.

### References

*Bible*. Web site [www.biblegateway.com](http://www.biblegateway.com).

*Odyssey* (translated by Samuel Butler). Web site [www.classic.mit.edu/Homer/odyssey.html](http://www.classic.mit.edu/Homer/odyssey.html)

De Pasquale N. (2011). *The Saved Kingdom*. Web site [www.quipus.it](http://www.quipus.it).

<sup>18</sup> With the same equivalence (one square cubit=one solar year) the measures of the ark give an accurate value of the precession of the equinoxes. The *Tabernacle* year is not enough to justify such an accuracy.

<sup>19</sup> 28 is sub multiple of 1,120 ( $28 \times 40 = 1,120$ ), which in turn is sub multiple of 62,720 ( $1,120 \times 56 = 62,720$ ).