

# The Venus Cycle and Venus Worship in the Ancient Near East

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*This is an expanded version of a short piece concerning the astronomy of Venus behaviour which I originally wrote under the Astroarchaeology section of [www.lanawooster.co.uk](http://www.lanawooster.co.uk). I believe it helps explain the high status given to that planet in the Mesopotamian pantheon.*

Modern astrophysics has little to offer in dealing with either ancient Babylonian astronomy or astrology: in fact, astrologers today - the direct heirs of Babylon's unbroken oral transmission - are more likely to be able to offer insights. Forgive me if I assume that not all readers will know about using the machinery of planetary behaviour to calculate time, since sometimes I will spell out some basics in order to build up the bigger picture. It is the early scholars of the ancient near east (usually the Germans) who had a grounding in standard astronomy and thus were in a position to spot the astronomical relevance of some of the first texts unearthed (this means many of their books have still not been bettered by modern scholarship)<sup>1</sup>. We have to put ourselves in the shoes of the astronomer-priests of the ancient world who like today's amateur astronomers went out and looked at the sky with the naked eye in order to plot the progress of the year: we must not impose the anachronistic assumption on our data that they were simply star-gazing for the fun of it. We overlook sometimes how important the development of a reliable calendar was for the successful operation of ancient near-eastern city states. Gradually knowledge of stars and planetary cycles inherited from the Neolithic period was refined - by rigorous observation and recording of data - using what we would now call the scientific method.

Using the interrelationship of planetary cycles to ratchet up to longer and longer stages of counting enabled the prediction of future cycles as well as the calculation of aeons of past history. Only once these were established could



**III. 1: 10C BC Old Babylonian boundary stone in the British Museum showing the discs of Moon, Sun, Venus, the Sibitti and Scorpio, the Rising Node beneath the Serpent, usually interpreted as the Milky Way)**

<sup>1</sup> Much of this paper is taken from Chapter 19 of my research into the Canon of Ancient Near Eastern Art (CANEA), accessible via this ink: <http://www.layish.co.uk/ch19s.pdf> (allow time to load) which gives bibliographical references in the first few pages

they move on to consider their effects and meanings - in other words, prediction of astronomical cycles must have preceded astrological interpretation, and pure astronomy (star and planet positions in relation to each other) still always remained its foundation. Thus, apart from iconographical connotations Venus must have gained her high status due to her part in the counting of time and we have a great deal of factual information that - using logical deduction and imagination - serves to back up our reading of symbols for, and images of, Venus (whether as Inanna, Ishtar or Astarte) on stone reliefs or cylinder seals (e.g. Ill. 12) - but we will also need to do some number-crunching!

The initial fact for us to take on board is that the Mesopotamians categorised Venus in a primary triad with Sun and Moon - as on the boundary stone above (we cannot stop here to identify the other imagery). In naked-eye observational astronomy, by using Sun, Moon and Venus positions together as interacting clock hands moving round the sky, it is possible not only to measure year cycles more exactly, but also to further predict recurrent short- and long-term periods of time in the future, and this paper will step by step show how it is possible to escalate the counting of longer and longer periods of time, to make sense of the figures calculated for past epochs as given by the ancient Egyptian priests and Zoroastrian Magoi in particular. We all know the first step in establishing a working calendar is to know how to calculate the start of the New Year so that the seasons do not slip out of synchronisation, but as Solar and Lunar cycles are only reconcilable, i.e. both return together to the same starting point against key marker stars every 18-19 years according to the Metonic and Saros cycles (more of which later), taking into consideration the shorter Venus' 8-year cycle helps as an intermediate unit to gauge progress of the two types of year and prevent slippages of the New Year Day. This will explain Venus' high status - not as Goddess of Fertility, but as Planet of Harmonisation (it is an inaccurate *cliché* to apply the usual blanket label when it does not always fit).

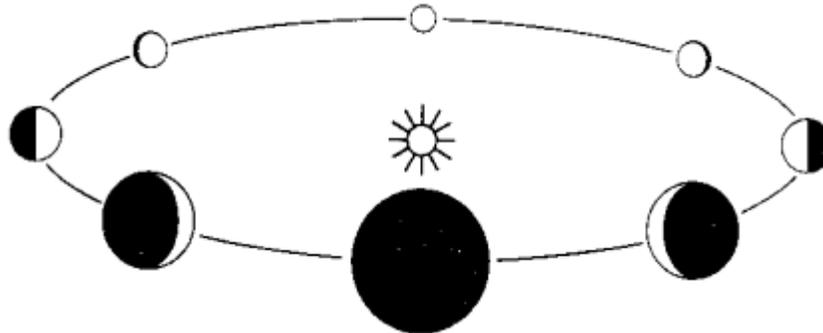


**Ill. 2: 2M Venus Tables of Ammisaduqqa c.1750 BC, British Museum (photo author)**

The Babylonians are famed for the records they kept of their observations of Venus behaviour: the best-known version of the Venus Tables, in finely written cuneiform on a clay tablet the size of a small mobile phone (above) now displayed in the British Museum and dating from the reign of Amisaduqqa (who ruled soon after Hammurabi). Sayce & Bosanquet<sup>2</sup> first translated these Venus Tables, which record the day-to-day Venus appearances and disappearances through the sky over 8 Earth years - constituting one synodic period (circuit of the zodiac back to its start point) of 5 Venus years. They realised the Tables could then be reused indefinitely since the cycle repeats over and over again in the same way the Sun and Moon cycles do, to the extent that - as implied from the phraseology used at times on the tablet - it was no longer necessary to actually to go out and observe the planet in the sky, since they could now take its position on trust, as present-day astrologers do<sup>3</sup> - the beginning of that disjunction between theory and practice that was to widen further over time. We now look in detail at the Venus Synodic Period.

### THE VENUS SYNODIC PERIOD

Venus travels round the Sun and from our point of view on Earth both appear to revolve together round Earth. From Earth's viewpoint this means Venus sometimes seems to go behind the Sun, looking smaller and crossing exactly behind it at Superior Conjunction. She then finally comes round to move in front of the Sun, but invisible to us (except at a Transit, of which more later) looking optically larger because nearer - at Inferior Conjunction:



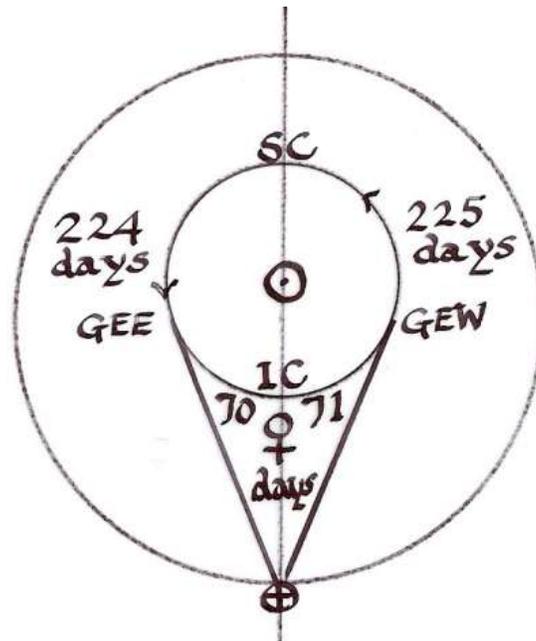
*Ill. 3: The Venus phases viewed from Earth: Superior Conjunction is behind the Sun, Inferior Conjunction in front*

In the intermediate stages of reaching these two extremes, Venus goes through crescent, full and decrescent stages like the Moon, and on rare occasions during Inferior Conjunction passes exactly across the Sun in what is termed a 'Transit of Venus', just as the Moon does in a Solar Eclipse. During such a transit Venus does not blot out the Sun at all: being further away it appears as a small black dot beetling across its fiery orb (Ill. 17)!

<sup>2</sup> Monthly Notices of the Royal Astronomical Society (MNRAS) XL

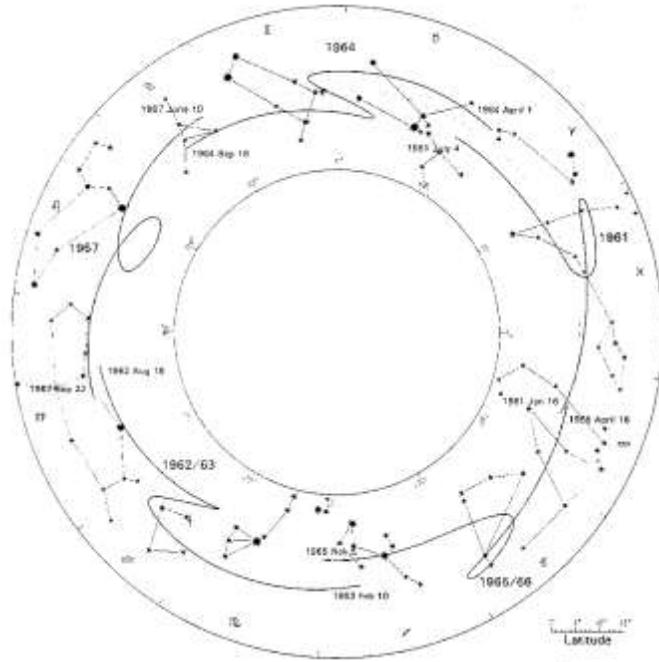
<sup>3</sup> Astrologers simply use planetary tables giving their zodiacal positions for every day (published annually in advance as in Raphael's Ephemeris - or even in book form giving positions for a whole century in advance). The fact that they still use positions as calculated for the Age of Taurus is a question we cannot grapple with here!.

The average time Venus takes to complete each quarter of her journey between Superior (when Venus is full) and Inferior (when Venus is blacked out) Conjunctions with the Sun - and her Greater Elongations (GEs) East and West with the various stages of crescent in between - is given in the diagram below in numbers of days which turn out more or less to be multiples of 36 - *this we can call the Venus constant*, and we will note its use by the Elamites.

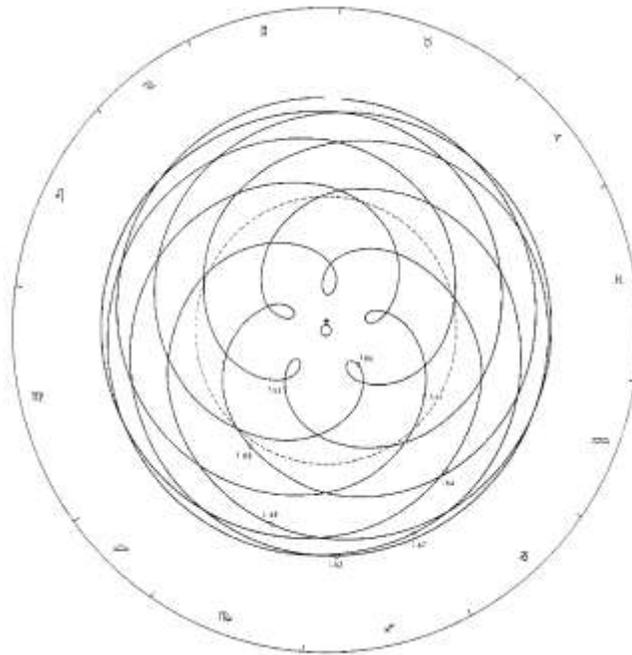


Ill. 4: The Synodic Period of Venus in relation to Earth  $\oplus$ : SC = Superior Conjunction; IC - Inferior Conjunction  
 GEW = Greatest Elongation West; GEE = Greatest Elongation East

The two pairs of numbers are asymmetrical compared with the even average solar interval of 90/91 days between solstices and equinoxes. During any one synodic period Venus appears first in the morning sky and then slips backward, disappears and then reappears, now rising in the evening. *The evening star period always follows 36-40 days after a Superior Conjunction* when it has reached 10° elongation away from the Sun - hence the significance of the number 40 so often repeated in ancient near eastern texts, including the Bible. After 6 months it reaches its Greatest Eastern Elongation (GEE at 46°-48°) during which time Venus is seen in the western sky for as long as 4 hours after sunset. It then starts to draw closer to the Sun on its trajectory and 3 weeks later is seen *setting* at twilight at 10° elongation from the Sun - and then can no longer be seen in the evening. In contrast to the Aztecs who saw the morning Venus as Quetzalcoatl the feathered serpent, the Babylonians visualised Venus rising in the morning as a bearded warrior, whilst in the evening she was invested with the identity of a conjugal and loving woman. *Each Evening to Morning Star period lasts roughly 9 Earth months, explaining Venus' association with fertility*, but it is her strikingly harmonious behaviour that is the real key to her power. In the process of coming back almost exactly to its starting point over one



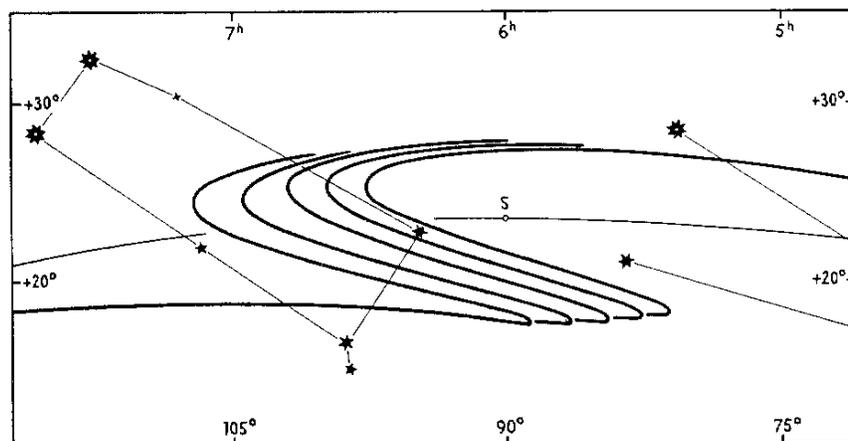
**Ill. 5: Mapping of actual Venus loops equally spaced against the Zodiac in one synodic cycle - from Schulz<sup>4</sup>**  
 synodic period, Venus' movements weave across the entire sky from one side to the other (as show above) making 5 retrogressive loops that in diagrammatic form creates what we might call a petalled pentagon.



**Ill. 6: The pentagrammic behaviour of Venus - from Schulz**

<sup>4</sup> Joachim Schulz *Movement and Rhythm of the Stars: A guide to naked-eye observation of Sun, Moon and planets* Edinburgh 1986 - his book is invaluable for its factual information and precise diagrams for most planetary cycles.

Why from Earth they look like loops was explained to me in a letter from an astronomer friend, the late Leslie White (Astronomy Correspondent of the **Daily Telegraph**): *The sidereal period of Venus (once round the Sun) is 224.7 days. That of the Earth is 365.25 days, so that when Venus has made one circuit, the Earth is still some way behind [hence the loop<sup>5</sup>]. ... The line-up (along the Inferior Conjunction - Superior Conjunction axis) occurs successively further east, but after 5 Venus years it occurs at the same place in the sky every 5 x 583.9 = 2919.5 days, or in solar terms 8 x 365.25 = 2922 days, a difference of only 2.5 days. Even closer, 13 x 224.7 = 2921.1 days, compared to 2922 days in 8 Solar years, which is only 0.9 days short of 8 years. All this means that Venus arrives at the same place in the sky every 8 years as seen from Earth, meaning Conjunctions and Greatest Elongations East and West also repeat in almost exactly the same part of the sky every time round (see next diagram below). This means that Venus phenomena repeat indefinitely just 2 days 8 hours earlier every 8 Solar years - a fundamental rule of thumb for time-measurement before the age of the clock. For example, a sequence of Venus slippages of 2.3 days against the benchmark Sign of Gemini over five 8-year cycles was charted by Schulz:*



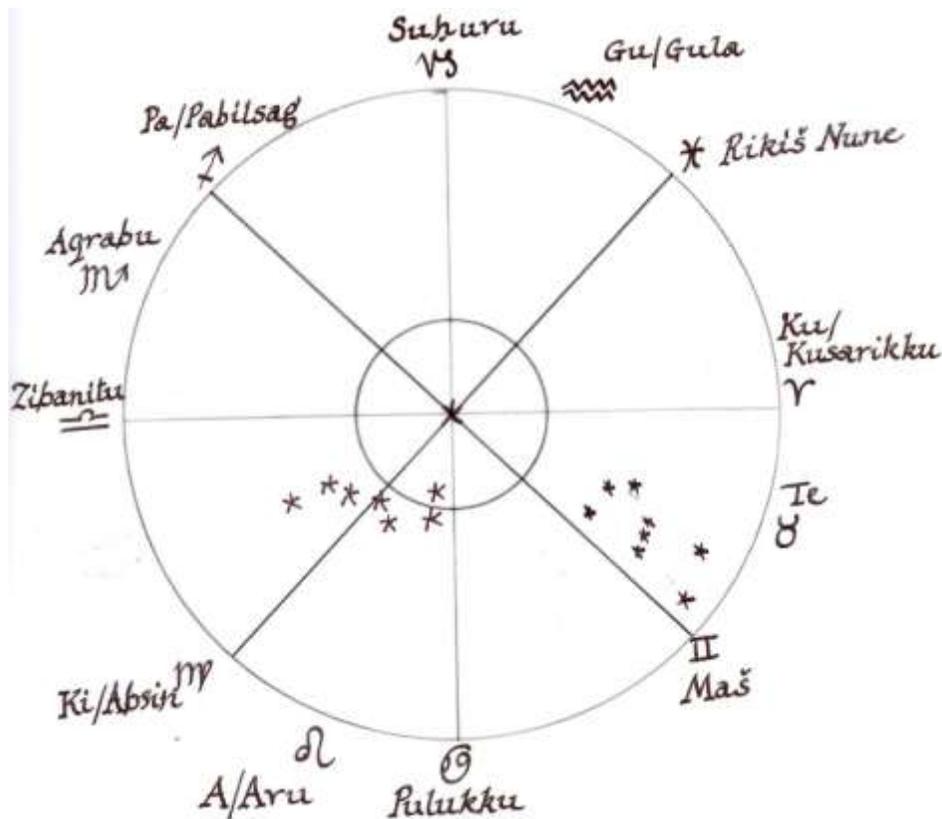
III. 7: *The Venus Synodic Slippage against Gemini - from Schulz*

Long before the adoption of Venus by Sumer and Akkad to regulate early forms of the calendar, it was the Elamites (their descendants still live on the plains between Iran and Iraq at the northern edge of the Persian Gulf) who were the first on record to make use of the Venus synodic period of 584 days: surviving clay tablets from Susa in the Louvre indicate this practice *must* date back to at least the 5<sup>th</sup> millennium BC, and it is thought over the centuries to have eventually reached Indonesia and finally Central and South America through Elamite colonisation eastwards. The Elamite calendar c. 4000BC divided up the Venus synodic of period of 584 days into 16 units of 36 days for their months - or 72 sets of 8 days for their weeks, with one last epagomenal week for the days left over (up to 8) which is close to the 5 epagomenal days added to the Lunar year of 360 days to square it with the Solar year of 365+ days.

<sup>5</sup> It is only at Inferior Conjunctions that Venus appears to move backwards in a retrogressive loop.

## VENUS AND THE EIGHT-FOLD DIVISION OF THE SKY -V- THE SOLAR YEAR

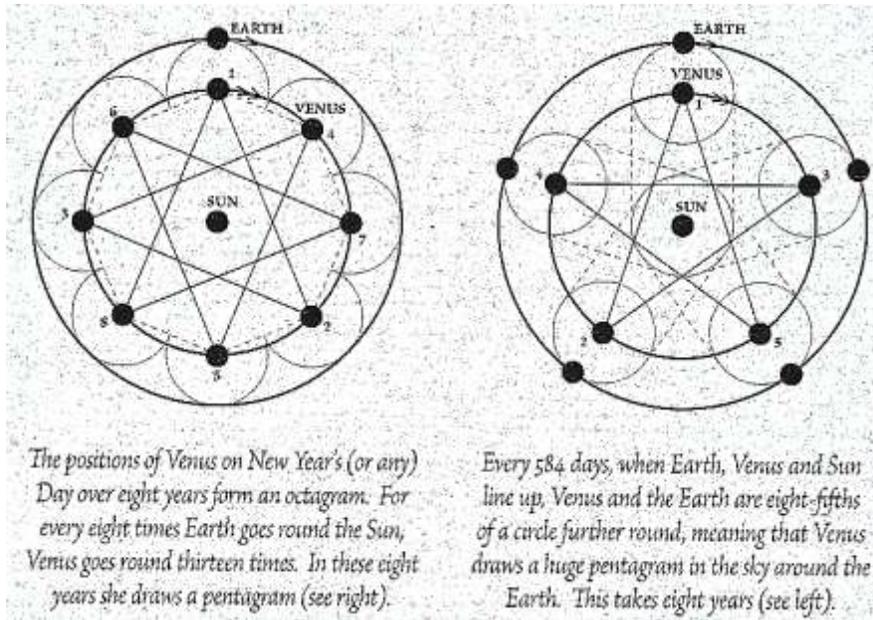
On the way to our present-day Zodiac, then, Venus behaviour was counted along with - and calibrated against - Solar and Lunar cycles. Until the Vernal Point moved to the newly introduced sign of Aries c.2000 BC necessitating a 12-fold Zodiac, there is considerable evidence for Venus' implicit presence in the more common Eight-Fold Zodiacs used in Mesopotamia in the Age of Taurus (the period when the Sun rose against Taurus at the Spring Equinox). Use of the 8-fold zodiac based on the 8 Earth Year partitions of the Venus Synodic period was still viewed as 'good ancient practice' in texts copied for the libraries of Assyrian (9-7C BC) and Seleucid (2C AD) temple observatories. Röck<sup>6</sup> therefore believed this most enduring of the original stages behind our present-day zodiac goes back to a time when the divisions of the sky were marked only by the 8 animals of the 4-3M Sumero-Susan zodiac, with a ninth month and its animal represented by the Dog of Sirius beneath Orion in the *Apin* (Plough/Great Bear) zone of the



Ill. 8: The earliest Sumerian names for key stars (not constellations), irregularly spaced (variations given for pronunciation are Seru for Ki; Enzu for Suḫuru and Zib for Rikiš-Nune)

sky) in the intercalary zone - these stars' distance from the Moon at New Year regulating the inclusion, or not, of a further month. It is due to that 5 Venus-year -v- 8 Solar-year interlock that a hidden set of octagonal positions governing Venus in relation to the whole sky is in operation:

<sup>6</sup> Memnon VI, 1912



III. 9: Useful thumbnail view of Venus' octagonal and pentagrammic behaviour - from Geoff Stray<sup>7</sup>

Röck<sup>8</sup> in his paper *Palaeozodiacus* wrote 'Die Bedeutung der Acht und Fünf als Ausgleichszahlen des Sonnen-Jahres mit der 584 Tage umfassenden synodischen Umlaufs-Zeit des Planeten Venus ( $8 \times 365 = 5 \times 584 = 2920$  Tage - oder zehn elamische Venus-Halb-Jahre) ist bekannt'. Certainly the octagonal features of Venus behaviour



III. 10: Eight-fold Aztec zodiac - though known as the Sun Stone divided according to Venus sky movements - 16C AD made for Moctezuma - Mexico National Museum

explain why an alternate version of the Elamite Year, like the Mexican one, was based on the Venus half-cycle of 292 days, with subdivisions of 8 months made up of 8-day weeks (the 8-day week survived

<sup>7</sup> The Mayan and Other Ancient Calendars Wooden Books 2007

<sup>8</sup> See references to his and colleague's early papers in the link given in fn.1

into the Etruscan and Roman calendars). This would be made up of 8 x alternate 32/33-day months - giving 260 days - plus a final month of whatever days were left to fit into the Solar year (between 30 and 34) - a system still used in Java today. The end/start or half-way points of a Venus synodic cycle every 4 years could also be used to double-check New Year's



Ill. 11: Palm-sized clay planisphere (Astrolabe K8538) c.650 BC British Museum, London (photo author)

Day every 4 or 8 Earth years, when again Venus' would be in conjunction with the Sun as it rose against the Vernal Point (c.f. the scenario on the cylinder seal in the next illustration). Altogether the 8-fold division of the stellar background is particularly convenient for measuring that cycle, and Venus' appearance in each successive sector at the end of each Earth year explains its rationale. We can even spot the persistence of the Eightfold Zodiac - though here more as a divinatory talisman - on the damaged 8-sector Assyrian clay planisphere<sup>9</sup> above (popularly known as Astrolabe K) to be held up to the sky for spotting New Year star positions (Venus is also named on it) -still labelled with Sumerian star-names!

This must be one reason why *Dilbat*/Venus is named first along with the stars *Apin* (probably one or other of the Bears) and *Iku* (either Auriga or Ursa Minor<sup>10</sup>) as lining up on the 0° Meridian at the New Year in Babylonian Star Lists - the most intact version of which is the *Mul Apin* tablet in the British Museum. Its most important chapter lists the pairs of rising and setting stars for each zodiacal month of the year, along with planets in their exaltations. In other words this triad - a planet and two constellations - mentions the most notable astronomical markers to look for (apart from Sun and Moon) as New Year pointers - we should follow this further.

<sup>9</sup> For an in depth analysis of what information is given on Astrolabe K, see Book 7A on [www.cosmokrator.com](http://www.cosmokrator.com) - though my overall conclusions about it were developed further in a summary paper to be published in the **ARAM Proceedings** of the *Astronomy and Astrology in the Ancient Near East Conference* held in July 2010 at the Oriental Institute, Oxford - viewable in the meantime on this link [http://www.layish.co.uk/astronomical\\_iconography\\_of\\_5\\_icons.pdf](http://www.layish.co.uk/astronomical_iconography_of_5_icons.pdf) .

<sup>10</sup> Fully discussed on my website at [www.layish.co.uk](http://www.layish.co.uk): click on the Sphinx and then the Research into the Ancient Near Eastern Canon of Art box - and choose the chapter 19 image in the Sibitti box.

## VENUS AND THE BEARS

The coupling of Venus with Ursa Major on a handful of Mesopotamian seal designs from the end of the Third Millennium into the Second Millennium is intriguing: due to space constraints I can only give a brief summary of what I explain with full references in the *Lion and Prey Rear Attack Catalogue* at [www.layish.co.uk](http://www.layish.co.uk) - here I can only give a taste of key features without other supporting evidence.

In the seal impression below Venus steps up onto the back of a lioness, her eight-pointed star just above her shoulder, in her right hand holding a double lion-headed mace (either a reference to the two Solstices of the year - or even more likely to her Inferior and Superior conjunctions with the Sun). In her left hand hanging down is a dog-leg shaped weapon (*harpé*) which I believe deliberately refers to the outline of Ursa Major - other Gods hold it too. Behind her a king offers respects to Shamash the Sun who rises up on the back of a lion - in the sky between them a bird (possibly a dove - also a Venusian attribute - in some ancient zodiacs representing the Polar Centre - sometimes



*Ill. 12: Miniature harpé (top) as held in the left hand of Ištar on a seal from Tell Asmar (middle Met.Mus.N.Y.), even more specific in the Akkadian Seal from the Chicago Oriental Institute (bottom)*

more specifically Ursa Minor) - an earlier Akkadian seal in the Oriental Institute Chicago has a finer rendition of Venus in this stance with her *harpé*, taking the theme back to c.2300 BC. The two heraldic groups of the suckling calf and two goats either side of a monticule to the side are standard images in



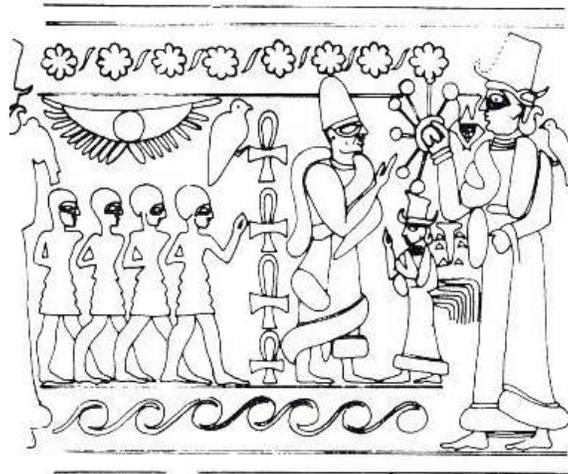
*Ill. 13: Ursa Major's positions throughout the year at midnight gives the year period in sidereal time*

the *Canon of Ancient Near Eastern Art* and refer either to the Equinoxes or Solstices (whether one of each, or both of one is not yet worked out). I take the overall scene as referring to Venus and Sun rising together - but what is the role of The Plough, bearing in mind the word *Apin* literally translates as *plough*? The Babylonians took particular pains to view the state of the sky at midnight (these days in Europe we take the state of the sky from newspapers as for 2300hrs (or even 2200hrs) when most people are still awake, but the purists would only consider 00.00hrs as valid for measuring the date of the coming day (which we still today in the West measure from midnight, not from dawn - or sunset as in the Jewish and Muslim calendars). The stars circling the pole which never set were classified by the Babylonians as the *ziqpu* stars, all of which travel the full 360° circuit round the pole every 24 hours, most distinctively represented by the bright seven-star constellation, Ursa Major. But at the next midnight there will have been a slight slippage backwards of almost 4 minutes' duration - such that over a year its position in the sky has precessed by the full 360°. Thus it is possible to tell at least the month of the year - if not the day - not just by the rising of the Sun against the Signs of the Zodiac at dawn, but - as a double-check - by the degree of turn of Ursa Major from a fixed viewpoint at the same time (midnight) every night. This is why Ursa Major, like Venus, was a crucial calendar calibrator (since independent of Sun and Moon) - hence it is not at all surprising to see Venus holding the constellation in her hand, or to see them listed in the *Mul Apin* star list together in the first triad.

Since 5 Venus cycles equal 8 Earth years (almost to the day) the Venus cycle was important for cross-checking New Year Day - and the reason why the Babylonians ranked her with the Sun and Moon. When Archaic Greece, learning from Babylon, adopted the eight-year cycle for their calendar they instituted athletic Games at key temple sites such as Delphi and Olympia to celebrate it - later making them every four years to mark the half-way point too. But a cross-check to the cross-check was to notice the position of Ursa Major in the sky and the fact that Venus holds it downwards possibly points to the time of year the Year Start would be measured from. There are Mesopotamian texts that specifically link Venus to the *Sibitti* - the Seven-star group which can refer not only to the Bears or Auriga, but

consequently also to the Seven-day week which the Mesopotamians lived by - all inherited by us and woven into our own calendars. Furthermore, some texts imply that although conventionally Venus is exalted in Pisces, due to the placement (first noticed by Ernst Weidner) of all the other planets in the Mul Apin list with their stars of exaltation, *esoterically* Venus is exalted in the Plough too - as a more dramatic zodiacal paranatellon<sup>11</sup> to Pisces' indistinct stars.

Below is a drawing of a 2M seal from Alalakh, Syria, a time when Venus for a short period was typically depicted wearing the Hurrian square hat, the brim suggestive of the divine horns. Apart from the Egyptianising Ankh pointers for Hathor/Venus, also part of Syria's coastal visual language of the time, she holds in her upheld right hand the seven-mace symbol of the Sibitti (Seven-Star) and has a pigeon or dove perched on her shoulder. Anyone ignorant of astronomy today usually still knows one trick: how



**Ill. 14: A Syrian king in fur-bordered robe pays respects to Venus with dove on her shoulder and holding a seven-fold mace (the second merges with the flower on the border)**

to find the Pole by using the stars at the side of Ursa Major to run a line up to the tail of Ursa Minor at the Centre. Let us not get into the displacement of the Polar Centre over the millennia - the basic indicators of that fixed zone of the sky have since the Second Millennium been the Two Bears - and it is feasible that Venus's weapon, whether dog-legged or seven-maced, represents Ursa Major, with the dove as further refinement referring to Ursa Minor further in.

As already mentioned, later in time thanks to its links to Cyrus' Babylon via Lydia, Greece drew on Babylonian astronomy to give its own tradition a kick-start, running many of its city calendars on the 8-year cycle (*oktaeteris*) - most notably at Olympia and Athens where festivities such as the Olympic Games or Panathenaic Procession were enacted every half-synodic period of four years to celebrate its half-way point, or completion (we know today that every 4 years is also a Leap Year, with one day intercalated onto February - a more regular refinement than the more rule-of-thumb intercalary measures taken in the ancient world whose variations we cannot treat here!). The 8-fold calendar could also have been introduced to Greece via Crete and Mycenae, but certainly also through oriental

<sup>11</sup> A star or constellation above or below a zodiac Sign - depending on observational angle.

colonies in Ionia and the Cyclades (Ionian doctors divided the year into 8 sections when diagnosing illnesses through stellar risings and settings).

### LONG COUNTS

We know that millennia later the Aztecs (their descendants being the Mexicans) used Venus cycles to calculate their calendar forwards into the future (ending in 2012) by using known planetary epochs to accrue what they called *The Long Count*. We also know the Mesopotamians and Egyptians worked out their own long counts backward in time, to map the duration of past epochs of their own far-distant history now lost to immediate memory, while it was a Babylonian (later Perso-Greek) speciality to work on the calculation of the length of the Great Year (the time it takes for the Sun to precess backwards through all the Signs of the Zodiac until reaches its original sidereal Vernal Point), an aspect of time-counting that Plato, thanks to his links with certain Magoi<sup>12</sup>, latched onto and described in *The Timaeus*. We know, too, that the Zoroastrians - like the Incas - were as interested in what future developments might be in sacred history - most notably the great periods of time involved between the incarnation of Saviours (Sayoshyants), Zoroaster being the most prominent.

From its intermesh with Lunar and Solar cycles we can at least give the theory for why Venus behaviour was so crucial for building up ever-larger units to give figures for the duration of the great epochs of time built in to their hagiography - whether past and future. So we will now summarise the Venus constants the astronomer-priests of ancient Iraq and Iran were certainly using by the time of Ammisaduqqa - and probably already developed in Akkad after beginnings in basic terms in protohistoric Elam before looking at longer-term interrelationships. Two caveats. We have to work in round numbers, which allow for discrepancies between Lunar and Solar calendars (there is an average slippage of 11 days between the two every year - giving a formula of 1 Solar year to be deducted for every 33 years of a lunar calendar) - and there are other chronological problems that mean we are only in a position make a general, though very credible case (the aim is to reach an overall picture). And if you find the coming numerical calculations too hard, skip the text as far as the last page and take the overall conclusion reached on trust!

### SUMMARY OF VENUS CONSTANTS IN RELATION TO SOLAR AND LUNAR CYCLES

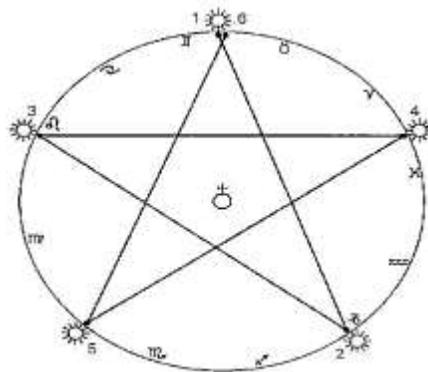
- The entire synodic cycle (sidereal revolution) of Venus lasts 19 months, an average of 584 days (in reality it fluctuates between 577 and 592) which can be expressed as multiples of the Venus constant of 36 days. This constant may be involved in the Sumerian sexagesimal system and the 360° applied to the horizon divisions.
- A half-synodic cycle of Venus takes 224.7 days which we have mentioned seems to have been used by the Elamites to count years (as compared with lunar years), perhaps because it is easier to see

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<sup>12</sup> To be the subject of a separate paper in 2013/14.

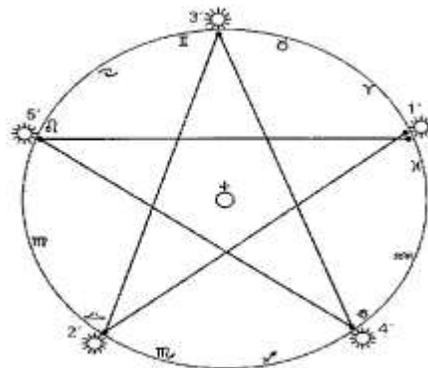
Venus for longer periods against particular stars at night than it is to see the Sun in relation to stars at dawn before it drowns them out of sight in its own brilliance.

- As shown earlier, the ratio of 8 Earth years to 5 Venus years is exact to within 2 days (sidereally to 1 day). *The ratio of the combined cycles of Sun:Venus:Moon is 5 Venusian synodic periods -v- 8 Earth Solar years -v- 13 Lunar years*, numbers in the Fibonacci series whose intervals are round number equivalents to  $\Phi$ , the Golden Section<sup>13</sup>). Put another way, a Venus cycle divides into 8 units of 72 days (576 days for an entire cycle) and 72 days is one-fifth of an ideal lunar year (360 days) whilst the rough count of 12 lunar months of 360 days is almost the same as a solar year of 365¼ days.



- Distribution and sequence of the superior conjunctions of Venus and Sun in 1952-61.

- 1 1952 June 24
- 2 1954 Jan 30
- 3 1955 Sep 1
- 4 1957 April 14
- 5 1958 Nov 11
- 6 1960 June 22



. Distribution and sequence of the inferior conjunctions of Venus and Sun in 1952-61.

- 1' 1953 April 13
- 2' 1954 Nov 15
- 3' 1956 June 22
- 4' 1958 Jan 28
- 5' 1959 Sep 1
- 6' 1961 April 11

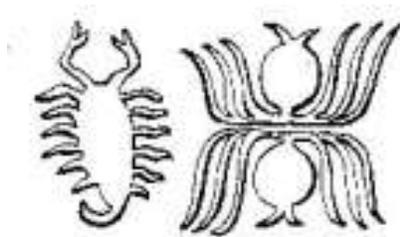
### III. 15: Case Study of the distribution of Superior and Inferior Conjunction points of Venus - from Schulz

- Five synodic period of Venus, with Inferior Conjunction loops lying at 72° from each other taking eight solar years to complete, can abstractly be summarised by the repeating pentagrammic pattern in the diagram above. No wonder the symbol for Venus through the ages has either been a five-petalled flower or a five-pointed star - so often appearing inside the lunar crescent on the flags of many Middle Eastern countries (and so attractive it was subverted by Communist regimes,

<sup>13</sup> See [www.cosmokrator.com](http://www.cosmokrator.com) Book 2 on Geometry.

with the sickle ominously taking the place of the Moon!). The angle at *Ishtar's* sharp point is  $36^\circ$  and the oblique angle inside the pentagon  $108^\circ$  - all Golden Section ratios.

- Following on from this, all intermediate types of Venus conjunction will also inevitably follow a pentagrammic distribution. The pairs of Superior or Inferior Conjunctions are restricted to five set areas of the sky separated by intervals of 72-73 days with an average 1-day slippage at each return once every four years: at present these take place in January, April, June, August and November.
- 20 lunar cycles are almost exactly equal to 1 synodic period of Venus which, since Venus has a Superior Conjunction with the Sun every 10 solar months (a half-Venus synodic period) and an Inferior Conjunction with the Sun after the other 10 months - can be conveniently tracked at intermediate stages by counting lunar cycles.
- Probably from the starting point of the triple conjunction of the Sun, Moon and Venus under the Bears and Auriga, it was possible as a rule of thumb to use periods of 292 days (the half-Venus cycle) to work out forwards or backwards in time when the three bodies will be back exactly in joint conjunction again - since  $5 \times 584$  ( $40 \times 72 + 40$ ) is the same as  $8 \times 365$  (or 101 lunar months, equalling 2920 days).
- Bork, a colleague of Röck, pointed out that in actual fact the Elamites, like the Mexicans masters of all aspects of the Venus/Quetzalcoatl cycle, for day-to-day use adjusted their Venus calendar to a base of 260-day units, leaving separate the last, ragged 9th intercalary Venus month - whose number of days fluctuates.
- So the half-Venusian *four*-Earth-year cycle was *as* significant to the pioneering peoples of the Susan Empire as the full 8:5 Sun:Venus year cycle. The two Venus half-cycles of four Solar years each I read as expressed in this contemporary (and widespread) Sumerian double pomegranate Inanna/Ishtar spider seal:



**Ill. 16: 4M Seal from Susa (GMA<sup>14</sup> 253); Scorpio, the Vernal Point Sun Set constellation is a New Year pointer**

- Venus' northern and southern nodes lie in Scorpio and Taurus and have barely moved over the centuries. In the period when Aldebaran in Taurus and Antares in Scorpio were taken as markers of the Vernal Point when their axis on the then  $0^\circ$  meridian divided the sky precisely across the North Pole into two halves, the coincidence with it of the nodal axis of Venus on it at New Year must

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<sup>14</sup> Pierre Amiet *La Glyptique Mésopotamienne Archaïque* 1980

have been spectacular, likely to be the period when Venus was first allocated its rulership of Taurus and made the benchmark for Venus cycle counting.

The obvious key value of Venus behaviour, therefore, is her character of supreme harmoniser in locking together Solar and Lunar cycles several times within any one person's lifetime - as well as (less frequently) those of the other planets over much longer periods (Mercury comes into the picture shortly).

The next step is to move up to the next gear and look at Venus timings when dovetailed with the Sun's Grand Precessional Cycle and the Great Year - just touched on earlier - and also the Moon's Metonic and Saros cycles.

### *USE OF VENUS CYCLES TO MEASURE INTERMEDIATE STAGES OF THE SUN'S PRECESSION*

The Aztec civilisation arose in the mid-second millennium **AD** as last heir of the Elamite system, but it gives us a case history of their astronomical preoccupations pertinent to this particular enquiry: the projection of longer epochs of time in relation to the cycles of Venus. This preoccupation was given round numbers in Plato's *Timaeus*, in which he calculates the duration of the Great Year of the Universe which we in the West call the Platonic Year, whereby (to simplify) over 26,400 Solar years the Sun gradually slips back through the entire zodiac, its Vernal Point taking roughly 2,200 years to precess backwards through each Sign until it returns to its original dawn rising Vernal Point against the stars. Plato sat at the feet of the priests of Egypt as well as learning from certain Zoroastrian Magoi - both known to be concerned with long cycles of Time and the rise and fall of past civilisations (including that of Atlantis) and it is extremely doubtful the Greeks were the first to 'discover precession' given their reliance on oriental sources. Different sources vary on the total length of the Great Year but it consistently hovers around plus or minus 26,000 depending on whether Lunar or Solar Years are used, and according to how rough the rounding up or down is: but there is no doubt overall about the general length of the aeon. In the short term, during any one person's lifetime it is possible to notice how the Sun's Spring-time rising slips back by 1° (1 day) over 72 years (compare this with 72° angle of the Venus cycle)-so that in theory it is possible to experience the process of Precession, but only infinitesimally! In present times the Sun's Vernal Point is reaching the last degrees of Pisces and Robert Powell<sup>15</sup> calculates that the Sun's Vernal Point will precess into 0° Aquarius in 2375.

Given that counting out the Great Year by each degree of Precession stretches over many generations of humanity over millennia, evidently the problem is to remember the point reached by the end of any generation in relation to its starting point. Astronomers of the ancient civilisations had a duty to hand on the baton from temple to temple, whatever the changes in location of the main civilisation of the time, and we are beginning to unlock how key stages are indeed signposted - through architectural alignments, special rituals, events and symbolic images - and only comparatively recently in written

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<sup>15</sup> *Hermetic Astrology I* 1987, 56

records. If the Long Count was started from scratch when the last Ice Age came to an end c. 1100/10,500BC and we are now in the 2000s AD, clearly we are in the zone of reaching the *half*-Great Year of 13,200 years (depending on what overall total is used). Furthermore, although the Mexican calendar may have been intended to clock up a *half* Great Year, depending on the starting point their forward-looking calendar end at 2012 might even mark its completion - it is certainly a clue to what they thought was some kind of end-point.

My purpose in this paper is to argue that, given this preoccupation in Plato's time which he had taken on from transmitted tradition, it is logical to use *a priori* reasoning to come up with the *probable* elements involved in such calculations. The next step is to show how two easily measurable Venus mega-cycle units make it possible to gauge in units of 1200 years or 250 years (millennium quarters) - what point the Sun's Precessional cycle must have reached.

- We have noted how Venus' pentagonal behaviour - whether for her conjunctions, maximum brightnesses or greatest elongations - is displaced backwards in the zodiac by 2°4' every 8-year period. The five corners of any of these phenomena regress after 30 such segments (72° of movement) by a fifth of a circle in a period of 243 years, equal to 152 synodic periods. (Note in passing that the Pluto cycle is 240 years.)
- This means that the period of rotation of the entire Venus pentagram back to its starting point takes 1199 years (call it 1200 in round figures). Put in other terms, 1199 solar years equal 750 synodic periods of Venus, or 1949 sidereal revolutions of Venus.
- Thus if astronomers were trying over many generations to keep track of the Sun's precessional cycle, one precessional cycle of Venus is usefully matchable to one half of the Sun's journey through any one Sign since for the Sun's 26,400-year precessional cycle, Venus does 21½ of its own precessional cycles within it (taking 25,779, plus 140 epagomenal years). Taking the analogy of a watch, one could say Venus acts as a second-hand to the minute hand of the Sun: if we check how far round the watch-face the second hand has reached we know how much of the minute remains.
- Translated into days, Powell in **Hermetic Astrology I** gives the following figures:  
750 synodic periods of Venus = 437,940.3750 days  
1199 sidereal Solar years = 437,942.3756 days (given the Sun's sidereal cycle is 365.25636 days)  
1949 sidereal revolutions of Venus = 437,941.8592 days
- This means that an entire sidereal cycle of Venus is short of its initial starting point of any particular fixed star (using the same star from which the Sun's sidereal cycle is calculated) by only 0.5164 of a day. This is so close as to be a negligible difference, so that the 1199-year Venus cycle (**in round numbers 1200**) is even more accurate in its repetitions than intermediate 8-year cycles

due to the 1.8-day margin of error between the Venus synodic and sidereal periods. This cycle in turn can be broken down into bite-size mega-Moon periods.

### VENUS, MOON, MERCURY AND SIRIUS

- The 19-year Metonic cycle of 235 lunar synodic months, equalling 254 sidereal Solar months, was certainly known in Babylon before the 5C BC. It is measurable by the return of the sequence of lunar phases in relation to the Sun to precisely the same sidereal longitude - at which point the sequence starts again, recurring every 235 months. As Powell puts it, 'The date of the Moon's phase can shift by one day either way - or on rare occasions by two days - over a 19-year period, but often it is exactly the same calendar date as 19 years previously'). This was the cycle made famous by Meton of Athens c.432 BC though highly likely he learned of it via Babylonian sources.
- The Saros cycle, on the other hand, is the 18½-year lunar eclipse cycle of 222/223 lunar months calculated on the return of the lunar nodes to exactly the same points on the Ecliptic (where if Moon and Sun coincide, an eclipse occurs). This again then self-repeats, enabling the *prediction* of eclipses. One British Museum cuneiform text lists 19 lunar cycles of 18 years, a table that combines the Metonic Cycle with the Saros period - 120 Saroi last 2220 years.
- The exactitude of a precise triple conjunction of Sun/Moon/Venus (to the day and hour) is increased over longer periods if the Metonic and Saros cycles of the Moon are taken into account: a 47-year period allows an even closer dovetailing of Venus: Moon: Sun to less than a day.
- This 47-year period ties in with Mercury's great return/precessional cycle of 46 years once every generation (a single Mercury synodic period is 116 days, such that 5 x 116 = 580 days, 4 days short of the Venus synodic period).
- The Moon's Saros period of 19 years fits into the Sirius cycle of 1460 years - 71 times. This was another way of measuring 1° of the Sun's precession. In other words, very roughly this period is close to the Sirius period of precession of 1471 years and roughly close to the half-precessional period the Sun takes to slip back through one sign of the zodiac.

This may explain the high status given to Sirius by both the ancient Egyptians and the Zoroastrians - suggesting that Sirius was the fiducial point from which any initial count began.

### SIRIUS, SOLAR AND VENUSIAN PRECESSION

- Venus finally completes a full revolution around the zodiac in 1215 years (5 x 243), or 760 synodic periods. This compares with the Sirius cycle of 1471 years. In the ancient Near East, Venus and Isis/Sirius were often considered one and the same Goddess, since 6 Venus precessional cycles of 243 years (roughly **250 years**) are equal to 6 Sothic cycles of 1471 years<sup>16</sup> Every time a Sirius

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<sup>16</sup> Herbert Chatley in his review of I E S Edwards' *The Pyramids of Egypt*, JEA XXXIV 1948 126-8

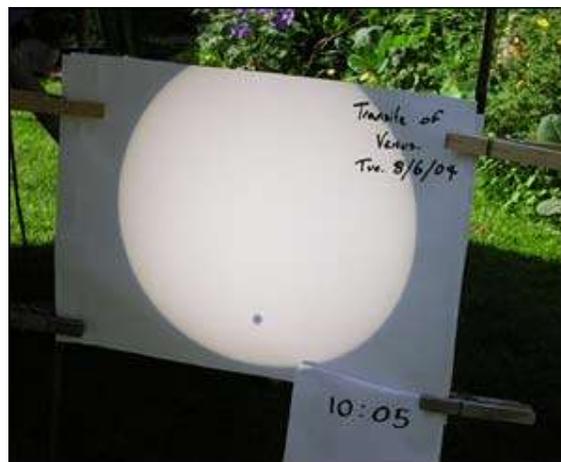
cycle completes there is a 1-day lag before returning to the starting point, as compared to 2 for Venus.

- Taking the cycle of the Moon as 29.2 days adds up to 1460 over the 50 weeks of the Lunar Year 1460/1461 is the number of days in a four-year cycle, including the Leap Year day. This total is the same as  $5 \times 292$  Venus half-synodic periods = 1460 days.
- The starting point for the calculation of Venus' synodic period was probably originally taken either from the ancient Egyptian benchmark of her rising with Sirius at dawn in Leo in July, or rising with it at night at the Winter Solstice at Mesopotamian New Year: certainly in Egypt Isis was identified with both Hathor/Venus *and* Sirius/Sopdet, just as in the Mesopotamian tradition Inanna/Ishtar (*Ish-shtar* simply means The Star) can refer both to Venus *and* to Sirius. Both are close also in scintillating brightness, earning the title of 'Queen of Heaven'!
- So if we count Venus' slippage backwards not in relation to the Sun, but in relation to any fixed star, the slippage every year against (to take the obvious example) Sirius is only 0.94 in every 8-year cycle, such that in every generation the constancy of Venus returns would be felt as all but fixed.

All these interrelationships show how easy it would have been to use one or all of them as 'pegs' in calculating the progress of the Sun's precession. They all interlock with one final phenomenon that must have been used as a convenient constant in calculating the passage of quarter millennia.

### THE TRANSIT OF VENUS CYCLE

- During 2012 the US and Europe fixed its gaze on a rare Transit of Venus across the Sun on the night of 5/6 June (the first crossing having taken place on 4 June 2004) - a rare occurrence compared to the number of times we observe the Moon crossing the Sun in any decade. It is possible this particular Transit of Venus was consciously seen as a signpost by the ancient Mexicans to end their calendar with.



Ill. 17: The Transit of Venus 6 June 2004, as projected on paper

- This is such a rare event (Thomas Cook's Endeavour had to sail to the Pacific Islands in order to be in position to catch the 18C Transit of Venus!) that, as Schulz explains, after the Venus transit in 2012 another *will not take place for another 121.5 years* at which point two superior (invisible) transits will occur within another 8-year period, and then it will be yet another 105.5 years until the next pair of *inferior* transits when Venus visibly crosses the face of the sun - on June 10 2247 and then June 8 2255.
- This is a repeating cycle whereby two Venus transits take place eight years apart at the ascending node, and then after an interval of over a century are followed by two similar transits at the descending node. The intervals between the individual transits are: 8 years; 212.5 years; 8 years and 105.5 years.
- It is not surprising, given what we know already about Venus behaviour, that this transit cycle repeats in the same pattern at the same intervals. As mentioned above, the nodes themselves wander so slowly through the zodiac that their movement is negligible. Thus the entire cycle for a recurring Venus on Sun transit (we cannot call it an eclipse) is 243 years and 2 days (roughly 250 years), neatly tying in with the Venus-Sirius precessional slippage).

This is an extremely useful unit of measure and I see it as very likely that the Transit of Venus unit could also have been used as a longer-term second-hand to confirm longer units of the Sun's precessional progress.

### CONCLUSION

If you have not been able to take all this in - especially as rounded up numbers as against precise numbers do lead to discrepancies, causing doubt - it is enough be aware of the general idea how very large cycles of time marked by Sun, Moon and Venus movement when tied in with those of other planets and stars (notably Sirius) have been used by the astronomers of great civilisations to measure great epochs - whether in round numbers or down to the exact year as Powell pins down! By rereading this paper at intervals, more and more of the significant numbers will sink in.

To summarise: the neat interrelationship between Sun, Moon, Sirius *and* Venus cycles would have enabled Mesopotamian astronomers to check intermediate stages of Solar Precession and thus retain calendar accuracy by using both

- ✪ the **1200**-year precession cycle of Venus (roughly two of which cover the length of time the Sun's Vernal Point takes to travel though any one Sign), and
- ✪ the **250**-year Transit of Venus cycle (which ties in with its own precessional cycle of roughly 250 years) - even more convenient for counting, by quarter-millennium.

To track back and try to link events to Transit of Venus moments in the ancient near east is outside the orbit of this paper, but if tied in to texts and artefacts using precessional software they could throw a more precise spotlight on surges in Venus worship. If awareness of these major units does not stretch

back to Elam, they certainly go back to Middle Babylonian times, and linked into this long count process are the numbers used for the age of Zoroastrianism - cited as either going back to 6000BC - or to 600BC - to be discussed in a future paper.

In looking into the astronomical nature of Mesopotamian iconography in this way, we reassess our idea of what 'worship' means. Anthropomorphised divine powers so often lead to the trap of thinking, for instance, that Christians really do revere an old man with a white beard, and in the same way we should not fall into the error of thinking the Mesopotamian peoples simply worshipped beautiful statues of Venus. We have to understand why particular human types were chosen as embodying different planetary effects - and that of Venus as Harmoniser is reflected in the choice of a beautiful woman, sometimes half-dressed to contrast her morning and evening risings. In reading the texts and images of the past, we need first to decode them in the light of the contemporary mind-set: then we understand the realities they represent are not mere superstition, but precise formulae for survival based on the need to maintain a measured life. Perhaps we can now see our view of Venus as Goddess of Love is less to do with human fertility than with 'The Love that moves the Sun and the Stars' - the very last line of Dante's *La Divina Commedia*.