

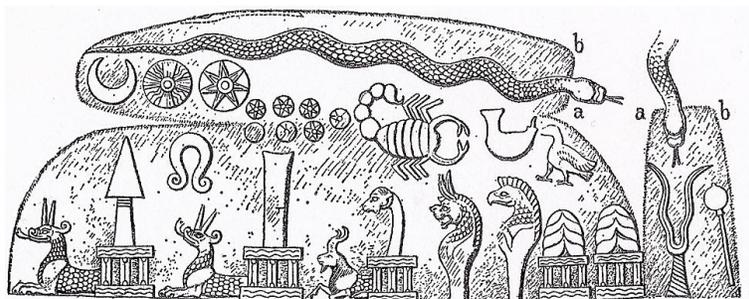
We live in turbulent times, when abnormal human behavior and alarming Earth disasters can be taken as signs of the Last Days prophesied in most religious traditions¹. Many wonder whether the ending in 2012 of the Aztec/Mexican forward-looking Calendar is another such sign. Since 2012 is next year it is worth looking into the possible reasons behind their calculation - and why I come to the conclusion we should take heart that it need not mean the end of humanity on Earth but simply the end of an era - and the beginning of a new one! I am *not* an expert on Mayan astronomy, but having worked extensively on ancient Mesopotamian astronomy (some references are in the footnotes) I am going to follow a theoretical take on Venus and time counting with you.

The Feathered Rattle Snake Quetzalcoatl, primaevial as a pterodactyl (*Diag. 1*), to the Aztecs embodied Venus as Morning Star - while they saw his twin brother Xolotl as the evil Evening Star of Venus at night. Quetzalcoatl was said to be so ugly that he wears a wind mask made of serpents writhing round his face - like our Gorgon.



Diag. 1: Basalt sculpture of Quetzalcoatl, Feathered Serpent of Venus c.1519, Mexico (recently on loan to the BM)

During 2012 the world will see a Transit of Venus/Quetzalcoatl across the Sun on 6 June - a rare occurrence compared to the number of times we observe the Moon crossing the Sun in any decade. Viewable to us in the West, it will be an obvious sign in the sky six months before the ending of 2012 at the Winter Solstice when a further, more invisible, landmark will be reached (see the last paragraph of this article). I believe the impending Transit of Venus was consciously used as a signpost marker by the ancient Mexicans to end their calendar by. Since Venus is very much involved in the counting of time and since we have a lot of relevant evidence, as background I am going to ask you to look with me at some key factors involving Venus in Mesopotamian astronomy - which we can assume were also known by the Aztecs. Starting at a basic level the initial concept for us to take on board is that Mesopotamians dealt with Venus in a triad with Sun and Moon (*Diag. 2*).



Diag. 2: 10C BC Old Babylonian boundary stone showing the discs of Moon, Sun, Venus, Rising Node, The Sibitti and Scorpio. Note the Serpent above them, here usually interpreted as the Milky Way: further gods are shown beneath

Click on this link to read on: <http://layish.co.uk/Venuscycles.pdf>

¹ In a Hadith (a reported saying of the Prophet in the Islamic tradition) children bossing their parents, and the building of tall skyscrapers to outdo each other in height are taken as such indicators!

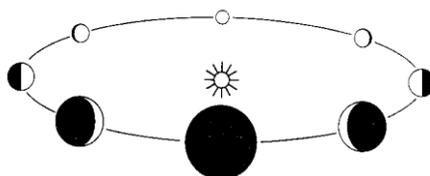
In naked-eye observational astronomy by using Sun, Moon and Venus positions together as interacting clock hands moving round the sky it is possible not only to measure year cycles exactly, but also to further predict recurrent periods of time. As Solar and Lunar cycles are only reconcilable (i.e. both return to the same starting point together) every 18-19 years using the Metonic and Saros cycles, tracking Venus' shorter 8-year cycle helps as an intermediate harmoniser between the two types of year - hence her high status as Planet of Harmony.

The Babylonians are famous for the charts they kept of their Venus observations (the best-known Venus Tables, on one clay tablet, are now in the British Museum and date from the reign of Amisaduqqa who ruled c.1750 BC soon after Hammurabi). But long before the adoption of Venus by Sumer and Akkad to regulate their calendar, it was the Elamites (their descendants still live on the plains at the foot of the Zagros Mountain between Iran and Iraq north of the Persian Gulf) who were the first on record to make use of the Venus synodic period of 584 days to regulate their calendar: surviving clay tablets from Susa in the Louvre indicate this practice *must* date back to at least the 5th millennium BC, and it is thought over the centuries to have eventually reached Indonesia and finally Central and South America through Elamite colonisation eastwards. Sayce & Bosanquet² first translated these Venus Tables - the day-to-day records of Venus' appearances and disappearances through the sky back to its starting point (a synodic period). 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 it was no longer necessary to actually to go out and observe the planet³ in the sky (like present-day astrologers!).

We now look in detail at the nature of the Venus Synodic Period to see how the Mexicans must later in time have used it too. At this point I must emphasise that modern astrophysics has little to offer to our understanding of either ancient Babylonian astronomy or astrology (*astrologers today are the direct heirs of Babylon's unbroken oral transmission*). 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 first-hand. Planetary cycles were worked out in rule-of-thumb round numbers, using their interrelationships to ratchet up stages of counting and enable the prediction of future cycles - and once these were established they could concentrate on their meaning!

THE VENUS SYNODIC PERIOD

Venus travels round the Sun (and from our point of view on Earth, both appear to revolve together round Earth - Diag. 8). From Earth's viewpoint this means that 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) and optically larger (because nearer to Earth) - at Inferior Conjunction:



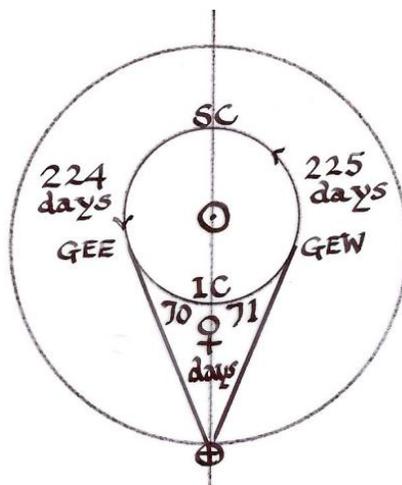
Diag. 3: The Venus phases viewed from Earth: Superior Conjunction is behind the Sun, Inferior Conjunction in front

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

² Monthly Notices of the Royal Astronomical Society (MNRAS) XL

³ I must emphasise very strong!

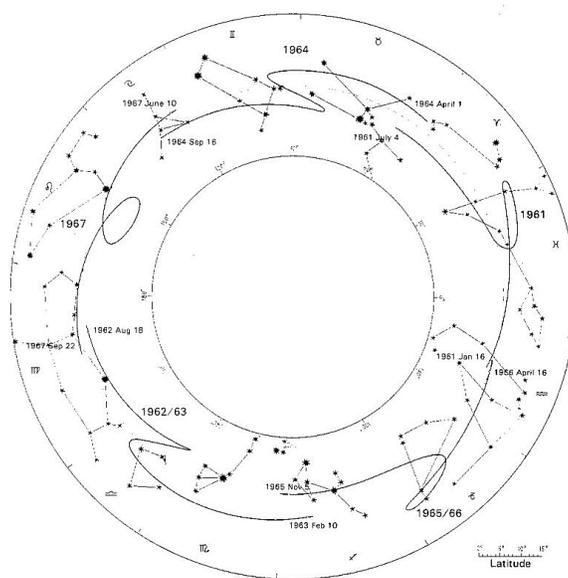
termed a 'Transit of Venus', just as the Moon does in a Solar Eclipse. During such a transit Venus does not blot out the Sun at all: being further away it appears as a small black dot beetling across its fiery orb (*Diag. 13*)!



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

The average time Venus takes to complete each quarter of her journey between Superior (when Venus is full) or 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 above in numbers of days which turn out more or less to be multiples of 36 - *this we can call the Venus constant*. The two pairs of numbers are assymetrical 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

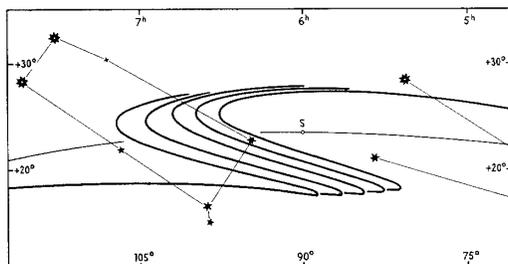


Diag.5 Mapping of actual Venus loops equally spaced against the Zodiac in one synodic cycle - from Schulz

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, the Babylonians saw Venus rising in the morning as a bearded warriress: in the evening her identity was female and loving. *Each Evening to Morning Star period lasts about 9 Earth months - hence Venus' association with fertility.*

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 lots 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. Over one synodic cycle, Venus' movements weave across the entire sky harmoniously from one side to the other making 5 retrogressive loops, forming a pentagon in the process and coming back almost exactly to its starting point (*Diag.5 and Diag.10*). 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 loop⁴]. ... 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 $5 \times 583.9 = 2919.5$ days, or in solar terms $8 \times 365.25 = 2922$ days, a difference of only 2.5 days. Even closer, $13 \times 224.7 = 2921.1$ 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 (*Diag.11*). 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 below:*



Diag.6 The Venus Synodic Slippage - from Joachim Schulz, Movement and Rhythms of the Stars⁵

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 in and assessed against Solar and Lunar cycles. Until the Vernal Point moved to Aries c.2000 BC necessitating a 12-fold Zodiac, from generations of first-hand observation there is much evidence of Venus' implicit presence in regulating the more common Eight- or Ten-Fold Zodiacs used in Mesopotamia in the Age of Taurus. These were still viewed as 'good ancient practice' in texts copied for the libraries of Assyrian (9-7C BC) and Seleucid (2C AD) temple observatories. Röck therefore believed this most enduring of the original stages behind our present-day zodiac goes back to a time

⁴ It is only at Inferior Conjunctions that Venus appears to move backwards in a retrogressive loop.

⁵ As Anthroposophist with Rudolf Steiner at the Goethenaemum, Schultz' book is invaluable for its harmonic approach and precise diagrams.

when the divisions of the sky were marked by the 8 animals of the 4-3M Sumero-Susan zodiac, with a ninth month and its animal marked by the Dog of Sirius along with Orion in the *Apin* (Plough) zone of the sky) in the intercalary zone, their distance from the Moon at New Year regulating the inclusion, or not, of a further month.



Diag. 7: Palm-sized clay planisphere (Astrolabe K8538) c.650 BC British Museum, London - photo author

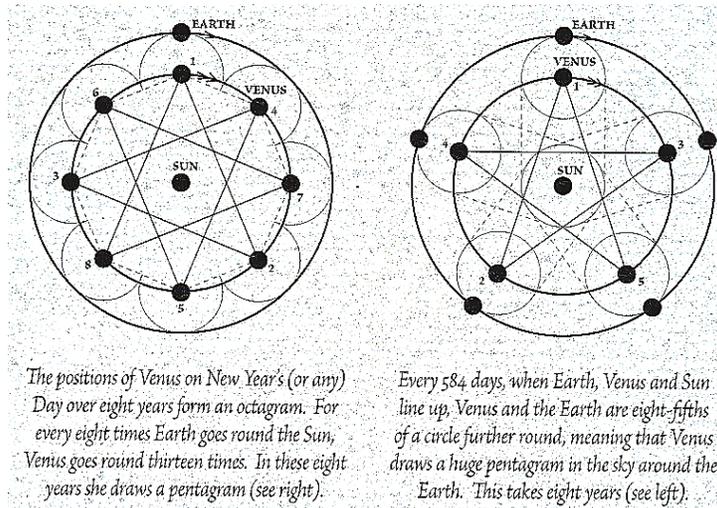
The end/start or half-way points of a Venus synodic cycle could be used to double-check New Year's Day every 4 or 8 Earth years when coinciding with the beginning of a new solar year, and an 8-fold division of the sky is particularly convenient as the stellar background for measuring that cycle, whereby its appearance in each successive sector at the end of each Earth year can be used to clock its progress (Diag. 8) - hence the persistence of the Eightfold Zodiac in the Ancient Near East into the 1M as above on a damaged 8-sector Assyrian clay planisphere⁶ held up to the sky for spotting New Year sky conditions - still with Sumerian star-name labels!

It must have been a practice also in Aztec Mexico c. 1500 AD to use the Venus synodic period as a cross-check to fix the start-line of the year every four or eight solar years. This fact must be the main reason why in Babylonian astronomy *Dilbat*/Venus is named first along with the stars *Apin* and *Iku* (probably the Two Bears) as lining up on the 0° Meridian at New Year in Babylonian Star Lists, the fullest copy of which is the *Mul Apin*⁷ clay tablet (also in the British Museum). Greece relied 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 was probably introduced to Greece either via Crete and Mycenae but also through oriental colonies in Ionia and the Cyclades (Ionian doctors divided the year into 8 sections when diagnosing illnesses through stellar risings and settings).

It is due to that 5 Venus-year: 8 Solar-year interlock that a hidden set of octagonal positions governing Venus in relation to the whole sky is in operation:

⁶ For an in depth analysis of what information is given on Astrolabe K, see Book 7A on www.cosmokrator.com - though my overall conclusions about it were developed further in my paper to be published during 2011 in the ARAM Proceedings of the *Astronomy and Astrology in the Ancient Near East Conference* held in July 2010 at the Oriental Institute, Oxford.

⁷ Fully discussed on my website at www.layish.co.uk: Click the Sphinx and then the Research into the Ancient Near Eastern Canon of Art box - and choose the chapter 19 link in the Sibitti box.



Diag. 8: Useful thumbnail view of Venus' octagonal and pentagrammic behaviour - from Geoff Stray⁸

Röck in an article called *Palaeozodiacus*⁹ 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



Diag.9: Eight-fold Aztec zodiac divided according to VENUS sky movements, though known as the Sun Stone - 16C AD made for Moctezuma - Mexico National Museum

behaviour explain why the most useful 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 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 and deriving, he reckoned, from ancient Elamite colonialism.

⁸ The Mayan and Other Ancient Calendars Wooden Books 2007

⁹ Memnon VI, 1912

Before focusing on how the Mexicans could then use Venus cycles to calculate vast epochs in pursuit of The Long Count, let us summarise the *basic* Venus factors known to astronomer-priests of Elam, Babylon and Tenochtitlan.

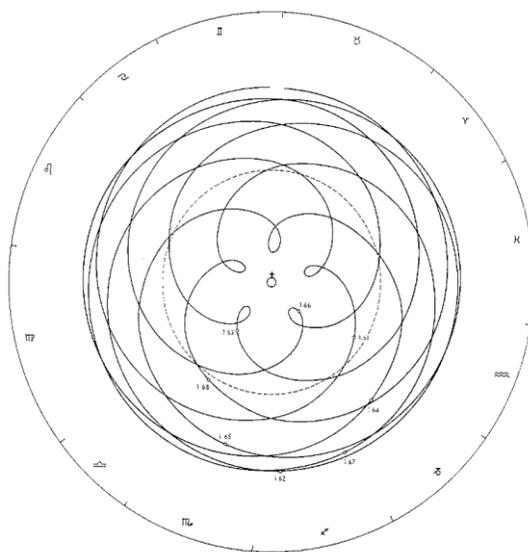
At this point if you are finding my backup evidence with all the numerical calculations too much, just jump through the pictures, letting them to speak for themselves - and skip the text until the last two pages!

THE VENUS NUMBERS

- The entire synodic cycle of Venus lasts 19 months or an average of 584 days (in reality it fluctuates between 577 and 592) all of which can be expressed as multiples of the Venus constant of 36 days. This constant may be the origin of the Sumerian sexagesimal system and the 360° applied to daily divisions on the horizon.
- A sidereal revolution of Venus takes 224.7 days to travel through the zodiac - this sidereal revolution of Venus seems also to have been used by the Elamites to count years, perhaps because it is easier to see 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.

NOTE: VENUS' SYNODIC CYCLE IS A VENUS RETURN IN RELATION TO THE SUN, WHEREAS HER SIDEREAL CYCLE IS A VENUS RETURN IN RELATION TO A MARKER STAR SUCH AS SIRIUS, WHOSE POSITION IS MORE PERMANENTLY FIXED AND NOT SUBJECT TO SLIPPAGE AS IS THE SUN'S.

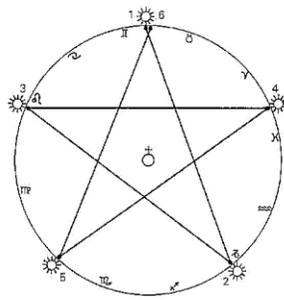
- The ratio of 8 Earth years to 5 Venus years is exact to within 2 days (sidereally to 1 day). The ratio of the combined cycles of Sun:Venus:Moon is 5 Venusian synodic periods:8 Earth Solar years:13 Lunar years, numbers in the Fibonacci series whose intervals are round number equivalents to Φ , the Golden Section¹⁰). 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.
- 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 below. 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, with the sickle ominously taking the place of the Moon!). The angle at *Ish-Star's* sharp point is 36° and the oblique angle inside the pentagon 108° - all Golden Section ratios.



Diag.10 The pentagrammic behaviour of Venus - from Schulz

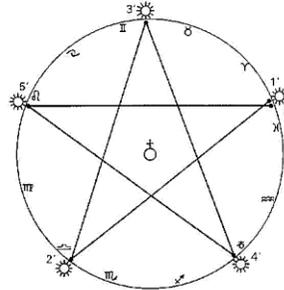
- Following on from this, all intermediate types of Venus conjunction also inevitably follow a pentagrammic distribution. The pairs of Superior or Inferior Conjunctions are restricted to five set areas of the sky separated by intervals of 72-73 days (*Diag.4*) with an average 1-day slippage at each return once every four years: at present these take place in January, April, June, August and November.

¹⁰ Venus' character 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 Divine Comedy.



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

Diag. 11 Distribution of Superior and Inferior Conjunction points of Venus - from Schulz

- 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: *one reason why the three planets used together were crucial to the Babylonians and Mexicans.*
- It is possible as a rule of thumb to use periods of 292 days (the half-Venus cycle)¹¹ from the starting point of the triple conjunction of the Sun, Moon and Venus to work out forwards or backwards in time when the three bodies will be back exactly in joint conjunction again - since 5×584 ($40 \times 72 + 40$) is the same as 8×365 (or 101 lunar months, equalling 2920 days). The Mexican calendar was based on this Venus half-synodic period¹² - but taking into account the next point.
- 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 are probably expressed in this contemporary (and widespread) Sumerian double pomegranate Inanna/Ishtar spider seal:



Diag. 12: 4M Seal imprint from Susa: GMA 253

- Venus' northern and southern nodes lie in Scorpio and Taurus and have barely moved over the centuries (hence the Scorpion in *Diag. 12*). 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° 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 have been spectacular (and perhaps the reason why Venus came to be exalted in Taurus).

The main feature of Venus behaviour, therefore, is her character of supreme harmoniser in locking together Solar and Lunar cycles - as well as (less frequently) those of the other planets over very much longer periods of time, which is where the Mexican Long Count comes in.

¹¹ The four-yearly Olympic games and other such events were very likely used in Greece to mark these Venesian half-synodic cycles.

¹² We know, of course, that the South American Naska Lines include a Spider.

THE USE OF VENUS CYCLES IN THE LONG COUNT OF THE SUN'S PRECESSION

Given the Aztec civilisation only arose in the mid-second millennium **AD** as the last heir of the Elamite system, we are now armed to understand that key aspect of the Mexicans' astronomical preoccupations pertinent to this particular enquiry: the interlacing of longer epochs of time in relation to the cycles of Venus in order to arrive at some understanding of whether we are getting near to an 'End of Time' moment. This preoccupation was built upon from already existing Hyperborean Neolithic knowledge¹³ by Plato and Pythagoras and put forward in *Plato's Timaeus*, where he calculates the duration of the Great Year of the Universe - to the Mexicans the Long Count (interestingly, it is highly likely Plato learned about Great Year calculations from Zoroastrian astronomer-priests who are on record by Xanthus as visiting him¹⁴). We in the West call it the Platonic Year, whereby 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 the Sun it returns to its original dawn rising Vernal Point against the stars. 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 1°/1 day once every 72 years (compare this with 72° angle of the Venus cycle)-so that in theory it *is* possible to actually experience the process of Precession infinitesimally!

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 in that Long Count. 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 they did indeed signpost key stages - through architectural alignments, special rituals, events and symbolic images - and only comparatively recently in written 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 we may be coming up to clocking up a *half* Great year by now, if records of any kind were maintained by some pocket of humanity somewhere in the world from the *previous* Interglacial (using marks on bones or megalithic cuppings) we could be talking about nearing the end of the *second half* of an entire Great Year, meaning the Mexicans realised their calendar end would see the completion of an entire Long Count.

I therefore believe the Mexicans used the upcoming Venus Transit of 2012 to dramatise and flag up their computations, to consciously end their calendar at 2012 at the cleavage line of a half - possibly even a whole - Great Year. Let me quickly explain what a Transit of Venus is:

THE 2012 TRANSIT OF VENUS

This is such a rare event that, as Schulz explains, after the coming Venus Transit in 2012 (a special case of a Venus conjunct Sun), another *will not take place for another 121.5 years* - at which point two superior

¹³ See Keith Critchlow's research on Britain's Neolithic stone spheres in *Time Stands Still: New Light on Megalithic Science* 1976/repr.2007

¹⁴ See especially Peter Kingsley's astonishing paper, 'Meetings with Magi: Iranian Themes among the Greeks, from Xanthus of Lydia to Plato's Academy' *Journal of the Royal Asiatic Society* V (1995) 173-209, accessible electronically via *JSTOR*

(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. In the first decade of the 21st century Venus' arrival at the nodal points of the Sun's ecliptic took place on 9 December 2003 (Superior Conjunction) followed in 8 June 2004 by an Inferior Conjunction. Only when Venus crossed the inferior node in *front* of the Sun did a *visible* transit of Venus take place on that second date, exactly equivalent to a Solar eclipse by the Moon, which I remember vividly: this is how it was recorded by amateurs:



Diag. 13: The Transit of Venus 6 June 2004, as reflected on paper, and photographed

We will not now be surprised to know, given the repeating cycle of 5 Venus' synodic periods as against 8 Earth years, that a second Inferior Transit of Venus is due to follow 8 years after the 2004 event (earlier by two and a third days in terms of Solar Year) on **6 June 2012**, and I think it highly significant that the Mayans ended their predictive calendar with an *octaeteris* (period of eight years) marked by visible Transits of Venus.

How the computation of a forward-looking calendar from so long ago is possible I would like to lay out below, the central factor being reliance on the repeatable nature of Venus behaviour which we looked at earlier for smaller units, but now taking into account the much bigger, also predicable, Venus cycles! We should then be able to understand how fairly easily countable *mega*-cycles of Venus make it possible to gauge, in units of 1200 years (in eighths of a millennium) or 250 years (in quarters of a millennium), what point the Sun's Precessional cycle (measuring out a Great Year) has reached! The old saying 'using a sprat to catch a mackerel' comes to mind, though I'm sure Venus wouldn't want to be equated to a sprat, nor the Sun to a mackerel!

The neat interrelationship between the Sun, Moon and Venus cycles - and of all of them within the Sothic Period of Sirius - had already enabled Mesopotamians to check intermediate stages of Solar Precession over centuries.

THE TRANSIT OF VENUS CYCLE

The Transit of Venus cycle also has a recurring pattern.

- ⊛ As described above, 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.
- ⊛ These transits repeat themselves 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.
- ⊛ 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-Earth-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 (note also that 240 is the number of years in a Pluto cycle), equal to 152 synodic periods.

- ⊛ The entire cycle for a recurring **Venus on Sun transit** is, therefore, 243 years and 2 days (roughly **250 years**, tying in with the Venus-Sirius precessional slippage, as we will describe under the next heading).

THE TRANSIT OF VENUS CYCLE OF 243/250 YEARS THEREFORE PROVIDES A LARGE UNIT OF MEASURE EXTREMELY USEFUL FOR THE CALCULATION OF WORLD AGES, SINCE IT IS ALMOST A QUARTER-CENTURY.

VENUS' PRECESSIONAL PERIOD IN RELATION TO SOLAR PRECESSION

- ⊛ Venus' own precessional cycle 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).

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 (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 from any particular fixed star (using the same star from which the Sun's sidereal cycle is calculated - probably Sirius) 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.
- ⊛ Since it takes the Sun roughly 2,400 years to precess through one Zodiac Sign, roughly *two* Venus precessional cycles of 1200 years each covers the length of time the Sun's Vernal Point takes to travel through any one Sign.
- ⊛ Thus if astronomers were trying over many generations to keep track of the Sun's precessional cycle, then 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 26,000-year precessional cycle, Venus does 21½ of its own precessional cycles within it (taking 25,779, plus 140 epagomenal years).

THE VENUS PRECESSIONAL PERIOD OF 1199/1200 YEARS IS THEREFORE ANOTHER, LARGER, RELIABLE UNIT OF MEASURE THAT CAN BE USED TO ASSESS THE PROGRESS OF THE SUN'S OWN PRECESSION, WHICH ITSELF CAN BE SUBDIVIDED BY VENUS TRANSIT CYCLES.

But to be practical, these large units of Venusian time need in turn to be built up in relation to the recurrence of the shorter cycles of Moon and Sun which would initially have been measured from a time when all three were lined up in the same part of the sky.

VENUS TIME UNITS IN RELATION TO THE MOON AND SUN

- ⊛ The 19-year Metonic cycle of 235 synodic lunar months, equalling 254 sidereal lunar 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. Powell writes in *Hermetic Astrology I* p. 317, '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, probably learned from 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 which again then self-repeats, and enables the prediction of eclipses. Brown mentions the BM cuneiform text which lists 19 lunar cycles of 18 years, a table that combines the Metonic Cycle with the Saros period - 120 Saros 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 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).

THIS MEANS THE LARGE VENUS TIME UNITS OF 250 AND 1200 YEARS COULD IN TURN BE BROKEN DOWN BY COUNTING METONIC/SAROS PERIODS, MOST NOTABLY IN 47/50-YEAR GROUPINGS MORE OR LESS EQUATING TO THE JEWISH JUBILEE PERIOD OF 49/50 YEARS.

Mastery of these interlocking large units of time at some far point in history when the Calendar in its complexity first began to be mastered (probably during the Age of Taurus)) needed all to be taken from one benchmark. The Egyptians had used Sirius from time immemorial, and since the 5C the Persians laid particular store by this star, for which their scriptures give ample evidence.

SOLAR AND VENUSIAN PRECESSION IN RELATION TO THE SOTHIC 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 almost exactly half the precessional period the Sun takes to slip back through one whole sign of the zodiac.
- ⊛ 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 x 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 at the Summer Solstice, 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, 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, 'Queen of Heaven'!
- ⊛ 6 Venus *Transit* cycles of 243 years (roughly 250 years) are equal to 6 Sothic cycles of 1471 years¹⁵ Every time a Sirius cycle completes there is a 1-day lag before returning to the starting point, as compared to 2 for Venus.
- In 760 synodic periods the Venus Transit cycle in its own mini-precession completes a full revolution around the zodiac in 1215 years (5 x 243). This is not far off the Sirius cycle of 1471 years (the Sothic Period), again a reason why Venus and Isis/Sirius were considered one and the same Goddess.
- ⊛ 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 is experienced as all but fixed.

VENUS MEGA-CYCLE UNITS USED TO MEASURE INTERMEDIATE STAGES OF THE SUN'S PRECESSION

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! Since no planetary cycle fits precisely into the others, there is always that slight discrepancy giving rise to a spiral phenomenon known as 'the Pythagorean Comma'¹⁶ which explains the variance in round numbers used (the Pythagoreans themselves reckoned the Great Year to be 25,800 years long, yet another variation!).

HAPPY GREAT NEW YEAR 2012

Daniel Pinchbeck in 2012: the Return of Quetzalcoatl (Chapter IV) describes how at the end of the Mexican Long Count, 'on the winter solstice of December 21 2012, the Sun will rise within the dark rift at the centre of our Milky Way galaxy, an event that occurs once every 25,800 years'. Given the Mayan calendar is based on Venus units - possible through naked-eye astronomy for all the cumulative reasons laid out above - I am pretty

¹⁵ Herbert Chatley in his review of I E S Edwards' The Pyramids of Egypt, JEA XXXIV 1948 126-8

¹⁶ I will explore this phenomenon eventually in my forthcoming Book 12 on www.cosmokrator.com

sure the mega-cycles of Venus were instrumental in enabling that Long Count, using the 250-year or the 1200-year blocks (plus epagominal leftovers) to predict that the *marker years* for the Great Year cleavage could be taken in 2004/2012 with the two Transits of Venus in our own lifetime described above. Obviously depending on the total of years used for the Great Year there is room for slippage either side of this date, but to wait until the next Transit of Venus would certainly be too far beyond the margin of error.

So there is no need to approach 2012 as the End of the World: you might remember how Millennium fever struck at the turn of 2000, but we are still here. Next year we will witness the end of the Mexican Long Count, and either the half-way point or even the beginning of a New Great Year! It is happening in the Year of the Olympics and, rarely, is viewable from Britain (Thomas Cook's *Endeavour* was tasked to sail to the Pacific Islands in order to catch the 18C Transit of Venus!). I think we are in for a momentous Year when signs in the sky will bring the World together in a conscious gathering for a Big Reckoning on many levels. I think it will mark the prelude to our first definitive step into the Age of Aquarius - whose character I am sure most astrologers can already see coming into play. Strictly speaking, Powell calculates that the Sun's Vernal Point does not precess back to 0° Aquarius until 2375 but events show the transition period has already begun - with all its ensuing turbulence!