Some say that today's global warming is caused by increases in man-made carbon dioxide emissions, but records show that past rises in CO_2 levels were caused by the release of CO_2 stored in the world's oceans as temperatures increased, and not the other way round. In the 1950s the scientist Immanuel Velikovsky explained why glaciers made of rain, sleet and snow can never grow; when temperatures *fall* less water evaporates from the oceans producing less rain, sleet and snow and when temperatures *rise* existing ice caps can only melt. And yet he knew that ice-ages—defined by the advance and retreat of glaciers—have periodically gripped the earth. He suggested that the only way ice caps could grow would be for the earth to heat up from within, causing the oceans to boil from below. The condensing steam would then fall as rain, sleet and snow and, during cooler periods, the ice-caps could grow.

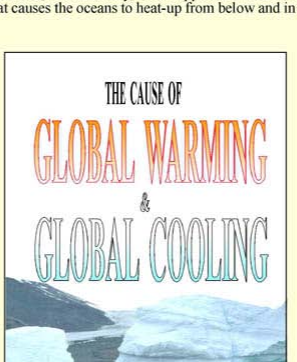
It's hard to imagine why some scientists tried to explain the cause of global warming in isolation of a mechanism that explains-away global cooling, and yet that is, incredulously, what happened over the closing years of the twentieth-century. This Paper reveals the mechanism that causes the oceans to heat-up from below and in so doing explains the cause of ice-ages and global warming.

page

1 *The cause of Global Warming and Global Cooling*

2 *The cause of Sunspots—how Mercury causes the differential rotation of the Sun's magnetic fields*

3 *Calculation of Sunspot cycles; the 11.49-year cycle, the 187-year cycle and the 18,139-year cycle*



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The cause of pole-tilts and changes in the earth's magnetic field 7

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Why the Sunspot cycle stops—the cause of the Maunder Minimum 11

Conclusion References 13

How the discoveries were made

How Gravity Works explains how heat and light from the Sun is converted into gravity waves that focus the Sun's energy deep into the centre of the earth. This constant downloading of energy, over billions of years, caused the melting of the earth's inner mantle. *The Cause of Global Warming* introduces a mechanism that explains the cause of long-term variations in mantle temperatures sufficient to cause the oceans to heat from below, and in so doing ratifies Velikovsky's ice-age mechanism and provides a corollary mechanism which explains the cause of global warming (together with other factors already known to influence variations in the amount of energy absorbed by the earth).

Summary

This explanation provides a causal mechanism that explains how both global warming and ice-ages periodically envelop the earth. The cause of the differential rotation of the Sun's magnetic fields is explained. The duration of Sunspot cycles is calculated. A mechanism to explain the cause of planetary axial pole-tilting and variation in dipole position is provided. The cause of Sunspot cycle cessation is explained.

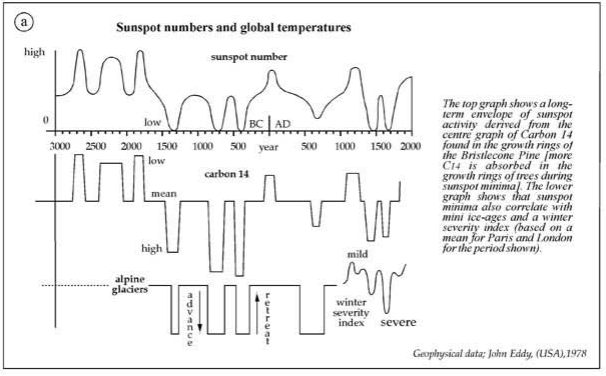
Conclusion; Mercury is shown to be the prime mover in regard to the differential rotation of the Sun's magnetic fields and consequential generation of Sunspots. Sunspot cycles of 11.49-year, 187-year and 18,139-years in duration are calculated. The earth's mantle temperature is shown to be instrumental in the cause of ice-ages and global warming and a mechanism is given to explain how solar magnetic variations cause increases and decreases in mantle temperatures, and hence global warming and global cooling.

The Cause of Global Warming and Global Cooling

Global warming and global cooling are known to be affected by the amount of solar rays leaving the Sun and by the amount of solar rays striking the earth. If we are to understand the mechanisms of global warming and global cooling then we need to take onboard Velikovsky's observations, together with our new understanding about how gravitational waves heat the earth from within.

The amount of solar rays striking the earth is known to be affected by the so-called Milankovich cycles [after the Yugoslav geophysicist Milutin Milankovich (1879–1958)] who suggested that three cycles affect the way sunlight strikes the earth; (i) the earth tilts on its axis with reference to the Sun over a 41,000-year cycle. (ii) At the same time it wobbles on its axis with reference to the zodiac during the 25,800-year precession cycle and (iii) a 92,000-year cycle of eccentricity occurs in the earth's orbit around the Sun that changes from an elliptical one to a near circular one [where the period of an ice-age coincides with the approach to circularity].

The amount of solar rays leaving the Sun is known to be affected by the number of sunspots (figure 1).



Sunspots and mini ice-ages

a) An inverse relationship exists between the number of sunspots and temperatures on earth, and also between the number of sunspots and variations in the amount of Carbon 14 in the growth rings of trees. The exact mechanism for this is not known but it is believed that, b), *increased* particle emissions from the Sun during periods of high sunspot activity prevent some solar rays from reaching the earth, resulting in less evaporation of water from the oceans, fewer rain clouds and an increase in temperatures.

c) During periods of low sunspot activity few particles are emitted from the solar surface allowing more solar rays to strike the earth causing a disproportionate *increase* in rain-clouds that lower temperatures. Hence, cooler temperatures (mini ice-ages) are associated with low sunspot activity. At the same time, more Carbon 12 in the atmosphere is converted into C14 due to the increase in solar ray bombardment, hence the increases in the levels of C14 during sunspot minimums.

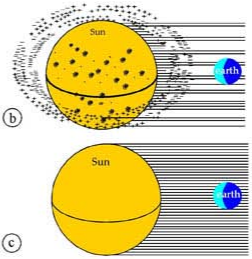
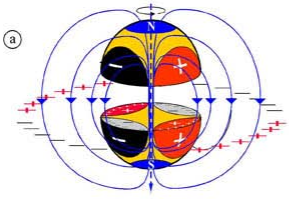


figure 1.



The Cause of Sunspots

The Sun has two magnetic fields; (a) the dipole field (illustrated in blue) ranges from North Pole to South Pole. Four 'bubbles' of magnetism also exist around the equatorial region (illustrated as red and black) that radiate charged particles [positive protons and negative electrons] into space as the Sun spins on its axis. This 'sectored-structure' of the equatorial fields was first detected by Mariner II spacecraft in 1962 and plotted by IMP I (Interplanetary Spacecraft I) in 1963.

The Sun is made of plasma [analagous to a kind of super-heated sticky gas] and spins on its axis differentially—the equatorial region spins once every 26 days and the poles spin every 37 days (on the solar surface). In 1961 engineers Babcock and Leighton proposed that sunspots were caused by the winding up of the Sun's polar magnetic field by the more quickly rotating equatorial magnetic field (see below). Orthodox Science does not understand why the Sun's equatorial region moves more quickly than it's polar regions—a mechanism to explain this is proposed below.

How Mercury Causes the differential rotation of the Sun's Magnetic fields [and the Babcock-Leighton Hypothesis]

(b) The solar sphere spins on its axis every 37 days [it moves by 9.729° per day]. In addition, the magnetic field of the planet Mercury which *orbits* the Sun every 87.969 days [4.09° per day] drags the equatorial region of the Sun around by 4.09° per day faster than higher latitudes. The *axial* spin of Mercury adds another 0.026° per day to this effect meaning that the equatorial region moves by 13.846° per day [i.e. it takes only 26 days for the equatorial region of the Sun to rotate once (28 days to an observer stationed on the moving earth)].

(b–e) The magnetic field of Mercury drags and, according to the Bacock-Leighton model, cumulatively wraps the Sun's dipole field around the solar disc. (f–g) The coiled dipole magnetic lines of force become entangled beneath the surface of the Sun causing bubbles of magnetism (h–i) to burst out of surface. (j) The areas of relative coolness appear as dark spots on the surface, pairs of which appear firstly at higher latitudes and then migrate towards the solar equator as the cycle progresses. After approximately 11.49 years [see 'Calculation of the Sunspot Cycle'] the polar field reverses direction and a new cycle begins with reversed polarity sunspot pairs.

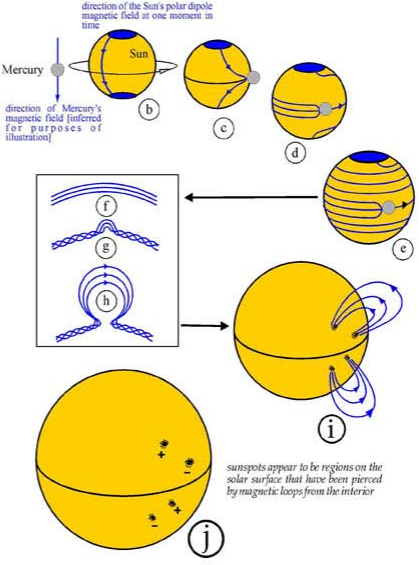


figure 2.

Calculation of the Sunspot Cycle

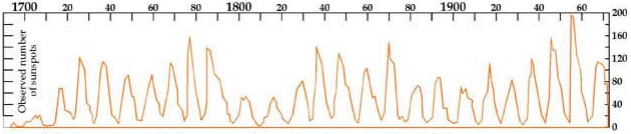


Figure 3. The (approximate) 11.5-year sunspot cycle from observation since 1680.

Modern astronomers maintain that the sunspot cycle cannot be calculated. They agree that the *average* cycle duration (from observation) is 11 years, or 11.5 years, depending on the period of history chosen to make the average. They believe it cannot be calculated because the cycle is dependent on *three* variables: the Sun's polar magnetic field (P), the Sun's equatorial magnetic field (E) and the earth (W). An analysis at any particular moment in time would mean describing the position of the Sun's two magnetic fields in relation to the earth's field and this cannot be done, they claim, because the behaviour of P & E is 'cumulative' (because it 'winds itself up'). But these objections may be overcome. It is possible to analyse the three variables and calculate the angular position between them using a method I describe as 'rotational differentiation' (figures 4b–d); because P and E are revolving at different speeds there must come a moment in time when they both occupy the same angular position (figure 4d). This happens every time E overlaps P, every 87.4545 days, which I refer to as one 'bit' of time. If we now look at P and E only every 87.4545 days they will always be in the same angular position together—although that angular position itself will change every 87.4545 days. This effectively 'glues' P and E together (providing measurements from that moment in time are taken only every 87.4545 days). The second step in the calculation is to draw a graph of the combined position of 'P & E' every 87.4545 days (figure 5a, red). The third step is to draw another graph showing the angular position of W every 87.4545 days (figure5a, blue). The final step is to subtract the W graph from the 'P & E' graph (figures 5bi–bxii). The resultant graph (black) shows the *difference* between the Sun's magnetic fields and the Earth. This method, written into a computer algorithm, provided the plot.

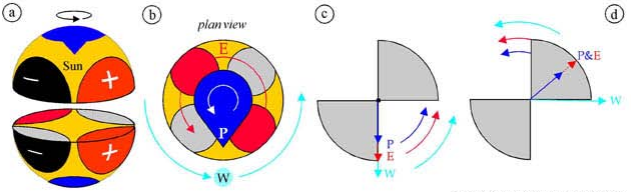


figure 4.

Figure 5a shows the two zig-zagging graphs (P&E, red, and W, blue) superimposed on top of each other compiled from data points every 87.4545 days (to save space, the first 73 intervals only are shown). The box beneath this (bi) shows the computer calculated *difference* between the two graphs for the same period and intervals and subsequent boxes (figure 4bii–bxii) show the continuation of the entire *'difference'* graph which continues far beyond interval 73, to interval 781, (before it repeats).

The 'difference' graph (figure 5bi–bxii) shows a number of pulses *(microcycles)* of magnetic activity each of which lasts for around 700 days (8 x 87.4545). In all, there are 97 pulses. This enables us to study the magnetic behaviour of the earth against that of the Sun. If, at one moment in time (figure 4c) the Sun's Polar field, Equatorial field and earth are all aligned, then the angular difference between them (Δ) will be zero. This is the start of the cycle. Then (figure 4d) all three start revolving (notice the distinctive shapes of the first few microcycles numbered 1, 2, 3, 4 , 5 etc in figure 5bi)). Notice also that the shape of the microcycle *following* 97 is exactly the same as microcycle number 1, and that this is followed by a repeat of cycles 2, 3, 4, 5 etc. These shapes tell us that P, E and W are once again all together after microcycle 97, after 'bit 781' on the graph. Another cycle now begins. Bit 781 multiplied by 87.4545 days = 68,302 days, 187 years. The sunspot cycle is hence 187 years long.

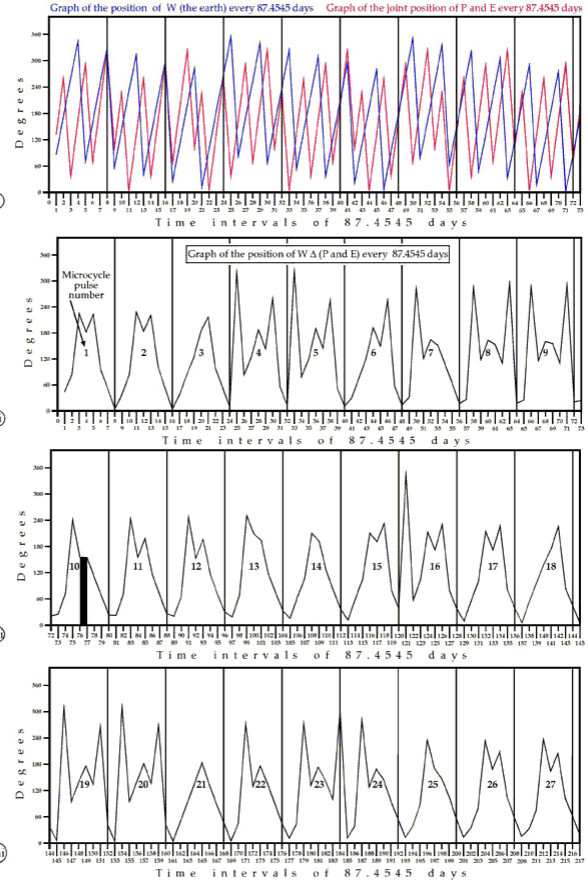

Graph of the position of W (the earth) every 87.4545 days
Graph of the joint position of P and E every 87.4545 days
Degrees
Time intervals of 87.4545 days
a
Graph of the position of W Δ (P and E) every 87.4545 days
Microcycle pulse number
bi
bii
biii

figure 5.

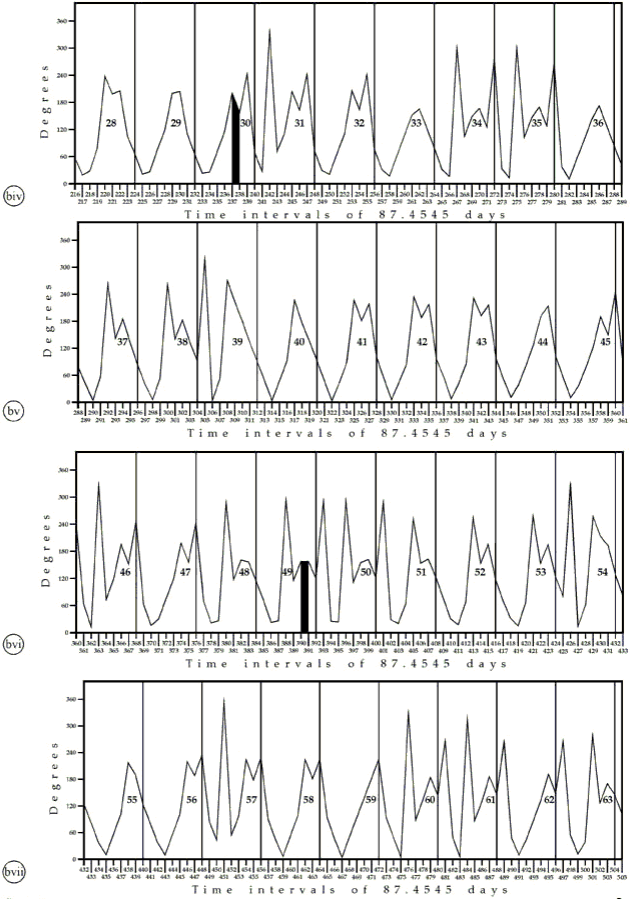


figure 5.

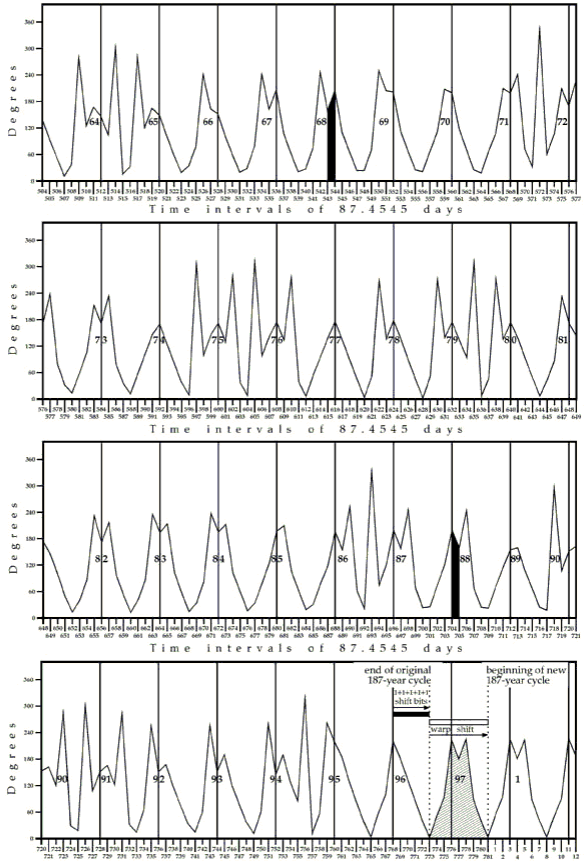

(bviii)
(bix)
(bx)
(bxi)
Degrees
Time intervals of 87.4545 days
end of original 187-year cycle
beginning of new 187-year cycle
-1+1-1+1+1 shift bits
warp shift

figure 5.

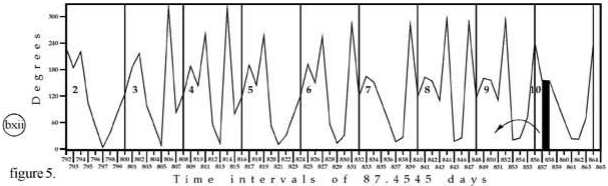


figure 5.

Figure 5bi–bxi. The computer-calculated version of the sunspot cycle showing the 97 microcycles of magnetic activity that take place every 187 years (68,302 days) and (above) figure 5bxii showing continuation of the cycle [with anticipated shift bit displacement *(see figure 8, later)*].

Having started rotating together P, E and W will not synchronise for 187 years, and then the cycle repeats. (This can be checked as follows 68,302 ÷ 26 (P) = 2,627 **complete** revolutions of the equator. 68,302 ÷ 37 (P) = 1,846 **complete** revolutions of the pole. 68,302 ÷ 365.25 (W) = 187 **complete** revolutions of W).

At first it seems that the sunspot cycle duration is 187 years long and that 6 microcycles must 'group' together to form one 11.499-year observed *fundamental* cycle (figure 6).

But there are two discrepancies: if 6 microcycles form one 11.499-year *'fundamental'* cycle, then the length of the sunspot cycle itself should be 96 microcycles [or at least some whole number of 6] not 97, which is what the 'difference' graph (figure 5bxi) shows. Secondly, if 8 intervals (bits) make up one microcycle then there should be 8 x 97 intervals (776 bits) in one complete cycle, but in fact the difference graph (figure 5bxi) shows 781, 5 more intervals than there should be.

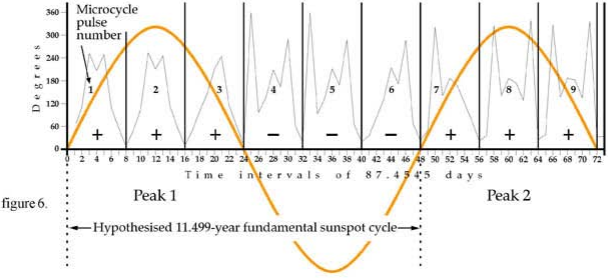


figure 6.

The Cause of pole-tilts and Changes in the Earth's magnetic field

Normally, at one particular time, we would expect the Sun's North dipole field to be 'all North' and the South pole to be 'all South', meaning that the magnetic field around the equator would cancel, amounting to a region of zero, or neutral, magnetic field. However the magnetic distribution of this area from observation is known to be 'warped' and 'tilted' (figure 7).

Examining figure 5bi–bxii); the five intersections of the warp show up clearly at microcycle pulse numbers 10, 30, 49, 68 and 88. These microcycles are 9 bits wide, unlike all of the others which are only 8. This suggests that the differential rotation of the Sun's magnetic field distorts and twists the neutral sheet into its warped and tilted position. The extra bits arise whenever the two waves intersect.

Plotting these along the entire length of the 187-year cycle it becomes clear what is actually happening. This tilted warped neutral sheet can be seen to 'modulate' (squash and pull) the observed sunspot plot (figure 9). The graph shows clearly that the warp interferes with the winding-up process of the Sun's magnetic fields. Where the warp crosses the microcycles the microcycles are shunted forward. The effect is to slow down the cumulative magnetic activity within the Sun such that the 96-microcycle series becomes 96 plus an extra 5-interval 'shift bits'. These

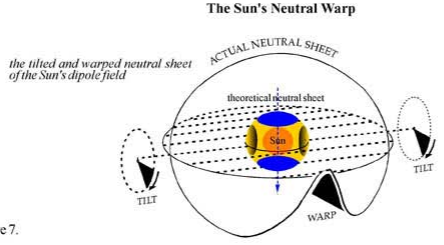


figure 7.

'bits' shift the entire hypothesised fundamental cycle forward by one bit at every point of intersection (figure 5bxii), examination of which reconciles the ostensible error between the hypothesised sunspot cycle [which should be 16 x 8 (768 bits)] and the actual printout that shows microcycle 96 ending at bit 773—the extra 5 shift bits shunt the cycle forward by 5 bits during the cycle accounting for the 'error' between the two values.

Addressing the problem of 97 microcycles instead of 96: examination of the graph also tells us that the new 11.499-year hypothesised cycle is displaced from the original 187-year cycle by 8 bits, one complete microcycle

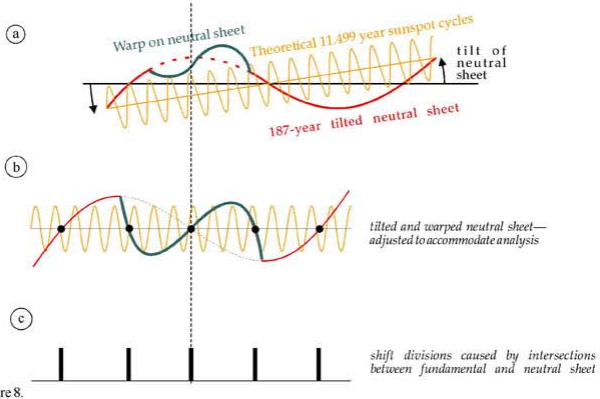


figure 8.

(number 97). It is the fundamental cycle that carries the warp. The graph is therefore telling us that the warp itself also must move by 8 shift bits every 187 years. This means that all five shift bits must move by 8 bits every 187-year cycle together with the neutral sheet, also by 8 bits (one microcycle) every 187-year period.

Individual shift bits trickle along the microcycle sequence. For one shift bit to move through 97 microcycles will take 97 x 187 = 18,139 years. This is the duration of one long term 'Grand sunspot cycle'—if P, E, W, *and the neutral sheet* all begin rotating together they will take 18,139 years to get back together again.

The analysis is even more revealing (figure 10a) : shift bits will *virtually collide* as they shift along the sequence. For example, because there are 20 microcycles separating bit E from D, and because the warp shifts one

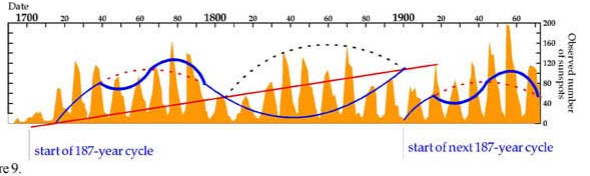


figure 9.

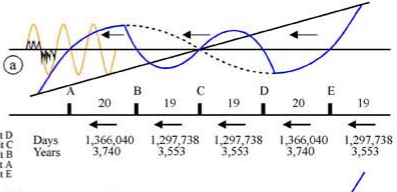
Figure 9. The warped and tilted solar neutral sheet can be seen to modulate (squash and pull) the 187-year sunspot cycle into its observed pattern

microcycle every 187 years, it will take 20 x 187 years for bit E to *'collide'* with the original position of bit D. This period of twenty 187-year sunspot cycles = 1,366,040 days.

We can mark the direction of the neutral sheet on top of the waveform using arrows, and again underneath (figure 10b). Then we can shift the neutral sheet along the sequence by 20 microcycle shifts so that bit E collides with bit D (figure 10c). This shows that the neutral sheet shifts direction from (approximately) northeasterly to (approximately) southeasterly over 1,366,040 days.

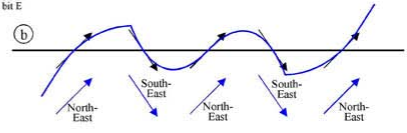
I first came across this cyclical behaviour of the Sun in around 1990 while simultaneously studying long-term sunspot behaviour and the civilisation of the sun-worshipping Maya of Central America c. AD750. They were of interest because they worshipped the number 1,366,040 and believed that the Sun brought catastrophic destruction to earth 5 times during every 'cosmic cycle' and, incredibly, analysis of the Sun's neutral sheet reveals that it shifts direction 5 times every 18,139-year solar cycle. So obsessed were the Maya with this 'revered

a) Graph showing the 6 microcycles of solar magnetic activity (black line) encapsulated inside one hypothesised 11.49-year fundamental sunspot cycle, followed by successive fundamental cycles (yellow line) that is modulated by the shifting tilted and warped neutral sheet.

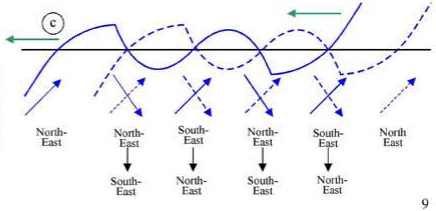


It will take 20 periods of 187 years for bit E to shift to bit D
It will take 19 periods of 187 years for bit D to shift to bit C
It will take 19 periods of 187 years for bit C to shift to bit B
It will take 20 periods of 187 years for bit B to shift to bit A
It will take 19 periods of 187 years for bit A to shift to bit E

Total = 97 microcycles



b) Solar neutral sheet showing direction of magnetic field along its length.



c) The neutral sheet shifts by 8 bits every 187 years, 97 times during one 'Grand solar cycle' of 18,139 years. The concomitant magnetic field changes direction (from broken-line to solid line) as the neutral sheet shifts.The changes in magnetic field direction are again indicated by arrows.

figure 10.

number' that they encoded it into one of their archeological treasures, the Sun-shield of Monte Alban (figure 11). Maya astronomers likewise tracked the number in one of their precious bark books the '*Dresden Codex*' using observations of the planet Venus that orbits the Sun every 584 days when viewed from earth. The accumulating columns of figures stop after 2,340 orbits of Venus; 2,340 x 584 = 1,366,560 days—the closest they could get to the solar neutral sheet shift period using whole orbits of Venus to monitor progression of the cycle. They referred to the 10th August 3114BC as 'the birth of Venus'. In *The Mayan Prophecies*' [1995] I explained why the Mayan Calendar began at that time—more than 3,000 years before the Maya arrived on the planet; they believed that on that date the Sun's neutral sheet shifted direction. Venus followed the twisting magnetic field like a compass needle and toppled on its axis, hence the name the 'birth of Venus'. Nowadays, the axial rotation of upside-down Venus has slowed to 224 days [1 day on Venus is 224 earth days long]. By worshipping the number as the 'rebirth of Venus' they were saying that they expected another solar neutral sheet shift to follow 1,366,040 days after the 3114BC event, around AD627, one that would destroy their own civilisation. By AD750 the Maya had all but disappeared; the sunspot minimum coincided with a solar neutral sheet shift that caused a mini-ice age (figure 1), reduced rainfall, drought and crop failure. At the same time [in *The Mayan Prophecies*] I explained how the 28-day spinning Sun, and the sunspot cycle, regulates menstruation and hence fertility in females and how an increase in X-rays from increased solar ray bombardment causes miscarriages in early impregnated ova at such times. It was the end for the Maya.

figure 11.

figure 11. The Maya of Central America encoded the solar neutral sheet shift period into one of their treasured artefacts, the gold and mosaic turquoise 'Sun-shield of Monte Alban' c. AD750:

The neutral sheet shifts direction after 1,366,040 days:
1,366,040 ÷ 365.25 = 3,740 (years):
4 (arrows) x 11 (pendants) x 85 (gold loops) = 3,740.

The four arrows symbolise the four previous ages of the Sun that all ended in destruction. The 85 loops around the perimeter represent magnetic field loops of sunspots that occur on the Sun's surface. [Secret pictures encoded in the mosaic pattern are revealed when a decoding process is used—see *The Celtic Chronicles*, M. Cotterell, 2006].

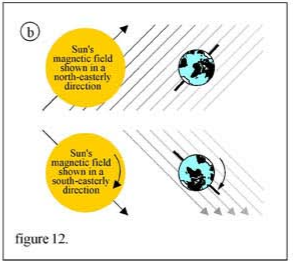


figure 12.

figure 12. The Sun's magnetic field and the earth's magnetic field are mutually coupled. Evidence suggests that changes in the direction of the solar field can topple the earth off its axis and/or cause heating of the planet from within. [Heating from within can melt the interface between ice-caps and the earth allowing the ice-caps to retain their original position during pole-tilting events, as the earth slides beneath].

Putting these observations together it is easy to see the cause and the effect; neutral sheet shifts can—if the effect is strong enough—topple planets in the solar system off their axes causing catastrophic destruction on those planets. This happened to Venus in 3114BC. The AD627 magnetic twist was insufficient to topple Venus but the other effects of the magnetic reversal [mini ice-age, reduced fertiltity and increased foetal miscarriage) were experienced on earth and were enough to all but finish off the Maya on earth. In the same book I proposed that this planet-toppling mechanism could have toppled the earth off its axis during prehistoric times (figure 12).

Velikovsky pointed out that science was at a loss to explain how coal deposits could have developed in the ice-cold tundra of the Antarctic where no trees grow, how fossilised palm trees could have established themselves at Spitzbergen in the arctic circle, which for months of the year is deprived of daylight and how perfectly preserved long-haired wooly mammoths, discovered under layers of Siberian permafrost with buttercups clenched between their teeth and undigested food in their stomachs, could possibly have survived in an area where no food grows.

Velikovsky was convinced that the Earth at some time in the past must have tilted on its axis, not gradually, but instantly, each time by a massive amount, causing catastrophic calamity across the globe. Areas once positioned at the Poles would have been repositioned at the equator and at the same time the hot equatorial regions would have flipped-over into the polar regions instantly freezing mammoths. Massive tidal waves would have swept across continents burying forests under miles of mud, mountains would have been levelled while sea-level plains would have been lifted high into the skies; accounting for the presence of large quantities of seashells in places like Tiahuanaco (Bolivia), 4,000 metres (13,000 feet) above sea-level.

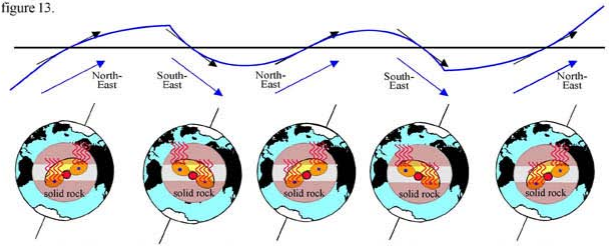
Some researchers claim that this can never happen, after all, the ice-caps are known to be millions of years old,

proving that the caps (and therefore the earth) could never have moved in the past—because if they had moved they would have melted and new caps would have formed. But this objection may be overcome as follows; earlier we noted Velikovsky's view that the only way for ice-caps to grow would be if the earth heated from within, causing the oceans to evaporate more easily. Rain and snow would increase, increasing the size of the ice caps during cooler periods. If the earth did heat from within then the polar caps would become slushy at the interface with the planet (underneath the polar caps). When the earth tilts off its axis the ice caps would be left behind as the earth beneath slides on a layer of slush—the earth can still tilt off its axis and the polar ice cores will retain their true age going back millions of years because the caps would remain stationary with respect to space. That this has happened in the past is borne out by the presence of massive stones and boulders that today litter open fields around the world. Geologists maintain that they have been *deposited* by *melting* glaciers but it is much more likely that the moving earth, beneath the caps, dragged the boulders into position.

Moreover, when the Sun's magnetic field twists and the earth does *not* twist off its axis the Sun and earth's magnetic fields will be mis-aligned. The mis-aligned magnetic fields will cause the circulating magma inside the earth to tilt, in an effort to re-alaign itself with the direction of the solar field. This tilting means that the circulating magma will now rub against solid rock producing more heat inside the planet and the above scenario would be set into motion. Such a phenomenon would also increase pressure within the core causing increasing volcanic activity and the blowing of super-volcanoes, more suspended ash in the atmosphere, cooler temperatures and a runaway cycle of global cooling causing the onset of an ice-age.

How the Sun's shifting Neutral Sheet Heats the Earth from Within

figure 13.



The earth's solid core (red circle) shown inside the circulating molten magma (yellow)—both shown inside the solid mantle (brown). [The angles of tilt are exagerated for purposes of illustration]. The tilted magma rubbing against solid rock generates additional heat.

Figure 13. Because the Sun and earth's magnetic fields are mutually coupled the Sun's shifting neutral sheet attempts to twist the earth off its axis five times every 18,139 years. Sometimes, when the magnetic twisting force is initially too weak, the earth maintains its axial orientation and instead only the circulating molten magma inside the earth tilts in response. The circulating magma then rubs against solid rock generating additional heat inside the planet. The temperature of the inner mantle increases causing the oceans to boil from below. During cooler periods the released vapour condenses, resulting in more rain, sleet and snow that allows the ice-caps to grow. [The core remains solid due to the increased pressure despite the increase in temperature]. Too much heat further increases the pressure inside the earth causing the blowing of super-volcanoes that fill the atmosphere with ash that obscures the Sun's rays, causing the onset of an ice-age. Global warming occurs during the intervening periods—when the earth's magma is not subject to tilting forces from the Sun's neutral sheet.

Why the Observed Sunspot Cycle Stops–and the cause of the Maunder-minimum

Figure 9, the observed sunspot cycle since 1680, shows that sunspot numbers fall close to zero every 11.49 years, every time the Sun's dipole field reverses direction. We also note that from 1645–1715 no sunspots at all were observed. Earlier it was proposed that the magnetic field of Mercury causes the differential rotation of the Sun's magnetic field. Clearly, for the sunspot cycle to stop it means that Mercury must periodically lose its magnetic field. The magnetic field (figure 14a) of Mercury is generated in much the same way as that of the earth. But Mercury is only about one quarter of the size of the earth and the pressure on the inner solid core much less than that acting on the earth's core. The core of Mercury is therefore much more prone to liquification if the temperature of the inner planet increases. If the core melts then molten magma no longer rubs against a solid core and Mercury's dipole magnetic field decays.

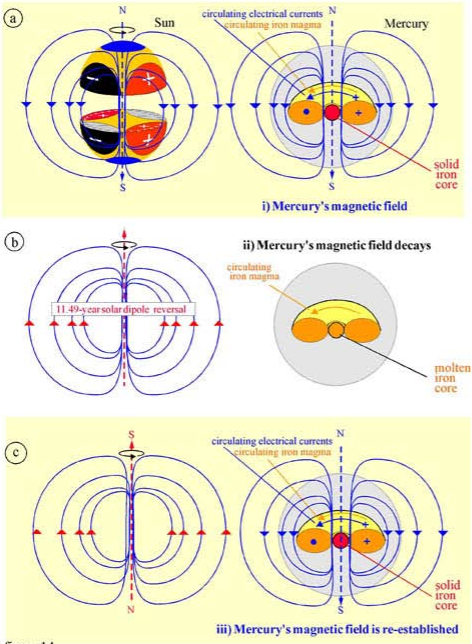


figure 14.

a) Mercury consists of around 70% iron. The axial spin of the planet causes a doughnut-shaped flow of molten magma to circulate around the solid core that remains solid due to the increased pressure in the centre. The molten iron rubbing against the solid core causes electrical currents to circulate around the magma that gives rise to Mercury's magnetic field. Mercury's field is magnetically coupled to that of the Sun's dipole field.

b) After around 11.49 years the Sun's dipole field reverses polarity. A pulse of magnetic energy is induced into Mercury causing Mercury to heat up from within. The solid core melts. The molten magma no longer generates a magnetic field and Mercury's magnetic field collapses. Mercury's magnetic field no longer winds-up the equatorial region of the Sun and the sunspot cycle stops.

c) After around 2 years the interior of Mercury cools and the core re-solidifies. The revolving magma once again rubs against the solid core and Mercury's magnetic field is re-established [in the same direction as before]. Mercury's magnetic field once again begins to wind up the solar dipole field and the sunspot cycle recommences [the direction of the solar dipole field remains opposed to that of Mercury for the next 11.49 years].

When the Sun's dipole field (figure 14a) reverses, every 11.49 years, a pulse of magnetic energy induces energy into Mercury, increasing the temperature of the inner core causing the core to melt. The planet's magnetic field (figure 14b) decays. The observed sunspot graph shows that after a delay of about 2 years Mercury's core must cool, the core again solidifies and Mercury's dipole magnetic field is re-established (figure 14c). Mercury's dipole field once again begins to drag the equatorial plasma around by 4.1 degrees per day faster than its poles and the sunspot cycle recommences in accordance with the Babcock-Leighton hypothesis. In regard to the Maunder minimum of 1645–1715 and other periods of history where the observed sunspot cycle is known to have ceased; clearly, some other source of magnetically induced energy must have caused the inner heating of Mercury and with it the consequential loss of its magnetic field at those times resulting in cessation of the sunspot cycle. The 18,139-year cycle, that shifts direction five times every 18,139 years, must download varying amounts of energy into Mercury, more so as the neutral sheet shifts direction and the rate of chage of solar flux increases and more so as the three sunspot cycles of 11.49 years, 187 years and 18,139 years synthesise.

The Mercurial dipole mechanism explains how the earth's magnetic field could have changed over long periods of time in the past; the earth's dipole field is known to have decayed and 'wandered' geographically in the past. Heating of the earth's core by solar magnetic influences would cause the earth's dipole field to decay and to tilt

[and wander geographically] in response to solar magnetic influences causing the earth's geomagnetic field to change direction accordingly.

The astute reader will have noticed that the solar neutral sheet sweeps across the earth once with every revolution of the Sun on its axis—like a lighthouse sweeping a beam of energy into space. Using this analogy, our analysis shows that the beam slips, slightly, with every solar revolution, against its position during its previous revolution, over an 18,139 year cycle. Analysis of the variables shows the cause. Observation (figure 9) shows the effect. But the intervening physical mechanism that accommodates and connects the two is not yet clear; it could be that the Sun's spinning neutral sheet sets up energy vibrations in solar system planetary bodies making them 'ring' at a particular frequency. That frequency will hence vary over the 18,139-year cycle. Changes in frequency affect the transfer of induced energy in accordance with Lenz's law of magnetic induction [which in our case would mean that the energy induced into a planet is proportional to the rate of change (frequency) of energy bombarding the planet].

Conclusion

Global warming and cooling of the earth is a function of:

Gravity;	Heating of the earth's inner core by gravity waves
Sunspot Cycles;	11.49-year fundamental sunspot cycles
	187-year solar neutral sheet cycle
	18,139-year Grand solar cycle
Milankovich Cycles;	41,000-year cycle
	25,800-year cycle
	92,000-year cycle

Footnote: Readers unfamiliar with my work decoding the treasures of the Maya will no doubt ask how the so-called 'primitive' Maya could have known about [what I refer to as] the 'super-science of the Sun'. Interested readers will find the answer to that question in the museum-quality specialist publications of: *The Amazing Lid of Palenque* (1993) and *The Mural of Bonampak (1993)* [both available in the British Library] and in the international bestselling books; *The Mayan Prophecies* (1995), *The Supergods* (1997), *The Tutankhamun Prophecies* (1999), *The Lost Tomb of Viracocha* (2001) *The Terracotta Warriors* (2005) and *The Celtic Chronicles* (2006), most of which are available on loan free of charge from public libraries around the world.

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Figure 12. *The Tutankhamun Prophecies*, Maurice Cotterell, Headline Books, 1997