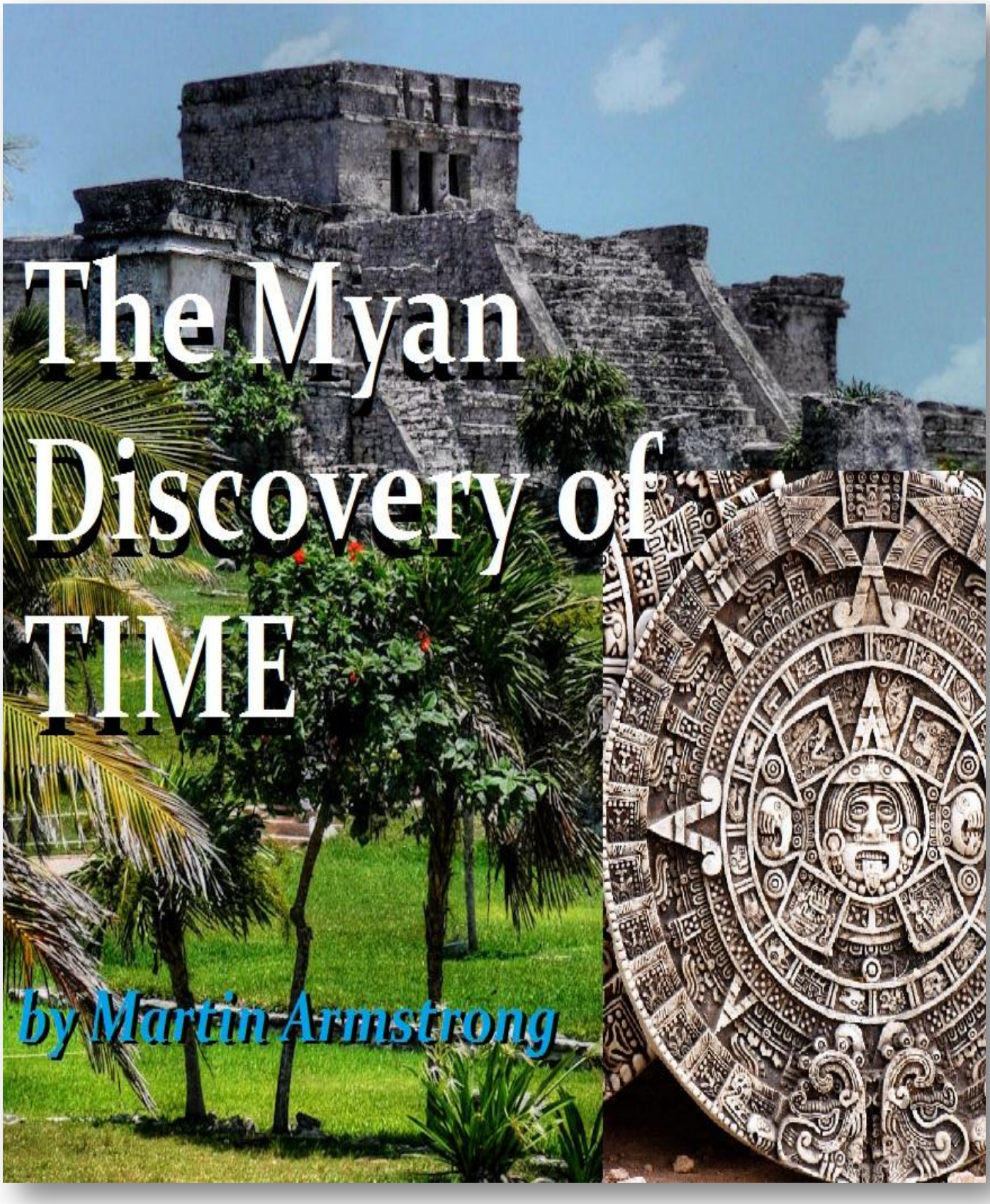
The Myan
Discovery of
TIME
by Martin Armstrong

The Mayan Discovery of Time

The Real Story about the claimed Mayan End of the World December 21st, 2012

by Martin A. Armstrong

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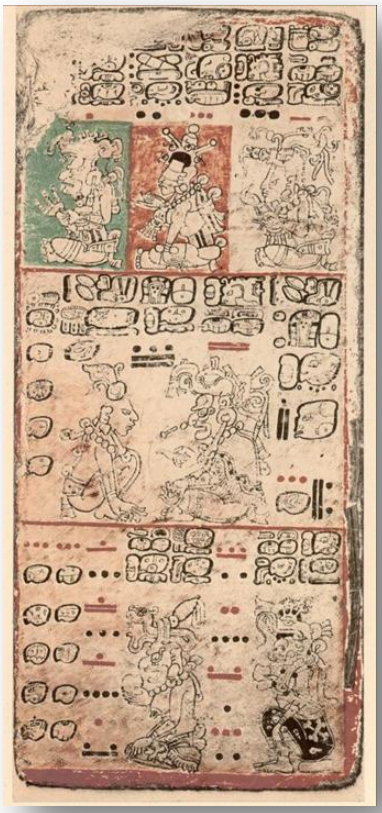
Prologue

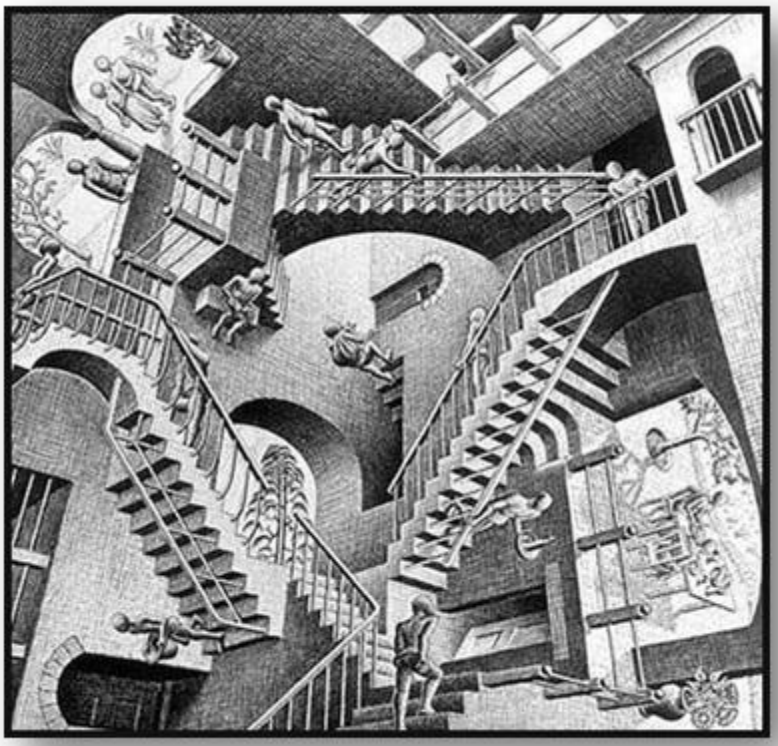
Mayan Discovery of Time

Hype is the word that comes to mind when I hear about 2012. People hijacking the Mayan calendar to fit some predetermined doomsday outcome and their secret agendas about how to use it. It saddens me that this is overshadowing the actual message of what the Maya truly discovered-**TIME**! Those who claim the Maya predicted the end of the world on December 21st, 2012, have greatly distorted the Mayan discovery from the end of a cycle to the end of a world. There has been a lot of proposed nonsense circulating about the Mayan calendar predicting the end of the world comes December 21st, 2012.



Does the Dresden Codex or other Mayan writing, actually predict the end of the world in 2012? When we turn to the reputed source of this prophecy about 2012, the ancient Mayan calendar, the hype seems to obscure the truth. It is true that December 21st, 2012 marks the end of the 13th Baktun which is an important cycle in the Mesoamerican Long Count calendar with the duration of 5,125.6 years. Obviously, even recorded history extends back further than that and the world did not end. Searching through all the thousands of Maya hieroglyphic texts reveals no such prognostication about apocalyptic disaster leading to the end of **TIME**. The prevailing notion that the Mayan calendar must reset in 2012 is rooted in the confusion between a "world age" and a "cycle of time". Periodization is the attempt to categorize the history of humankind or divide **time** into named eras. The result is to typify periods of time with relatively specific characteristics and events.

Sadly, all the hype by those who seem to love to wish disaster upon mankind for some kind of retribution since they feel short changed in fortune and/or skill, has to obfuscated the genuine contribution that the Maya made to the knowledge base of society. There exists no such reference in the Mayan text that supports their doomsday conclusion – it is just interpolation; nor is there some age of materialism that is predicted to end as we all just handout flowers in airports while begging for money. They also fail to explain how this same cycle has concluded many times before without the end engulfing the world in some cataclysmic end.

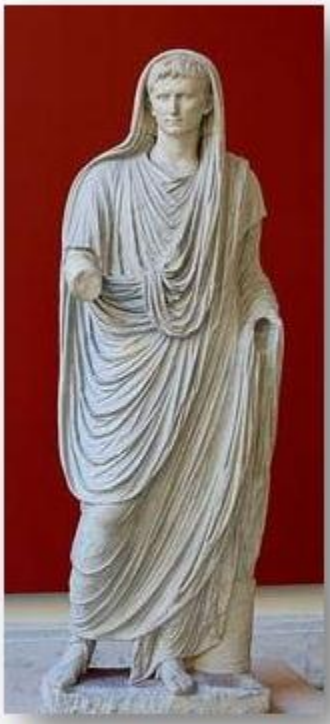


In reality, there are just closet communists who always hijack whatever they can to complain about the Age of Materialism and how we are all doomed. Yet their obsession with other people having more money than them is not materialism in itself. Even in the Ten Commandments it is stated that you should not covet their neighbor's possessions or wife. Nowhere in the religious texts of Judaism, Christianity, Hinduism, Buddhism, Islam, or the ancient religions and cults is any god ever claimed to have decreed it to be unfair and sin for anyone to possess more than another be it material or talent. Yet people have been obsessed with wealth and these prognostications that we are on the verge of a collapse in materialism is just gibberish. It is human nature to pursue one's talents and self-interest. It is a crime when one uses wealth or power to exploit others. However, the mere possession of wealth alone does not create evil any more than the possession of a gun transforms someone into a madman. In Switzerland, every citizen is armed for they have a citizen militia. The Swiss do not run around shooting each other simply because they have guns. People kill people and have been do that long before guns were invented. Adam Smith's Invisible Hand explains human nature quite well insofar as when opportunity appears, those with the talent will fill that position and thus the economy emerges from the synergy of everyone filling those gaps. It was Sir Thomas Moore who wrote the book "Utopia" that was a fictional world with the name taken from the Greek ***ou-topos*** meaning "***no place***" that was a pun on ***eu-topos*** meaning in Greek a "***good place***". Nonetheless, people insist upon creating the perfect world that cannot exist without eliminating human nature.

Yet, these usurpation of the Mayan and distortion of what they were investigating and attributed to them the insanity of the usurpers when the Maya made no such pretended claims. This usurpation of

what the Maya were all about has hampered any real investigation into the complex components that are behind the cycle and how it functions. They have distorted what the Maya really discovered that lays at the very core of understanding of how the universe actually functions. The world does not end on December 21st, 2012. However, what does happen is the birth of a new cycle and most likely a profound evolutionary change in how society functions. This will not be the nonsense of ending Materialism. There is no such period in the history of mankind. Marx was followed by Lenin and Mao and both systems collapsed because they sought to eliminate the business cycle which is driven by human nature.

We face a time for change in society and in the earth cycles around us. The entire universe functions in a cyclical manner and even the sun beats like your heart to a rhythm of about 300 year cycles between the maximum and minimum energy output. But this does not signal the end is near nor will corruption come to an end. Even after the Civil War in Rome and the Age of Republicanism collapsed being replaced with Imperialism, this was a similar time when corruption was widespread and Rome fell into the clutches of the Oligarchy let by Cato (95-46BC). Moral values had collapsed and the first Roman Emperor Augusts introduced family laws in a crusade to revive temperance and morality.



August (27BC-14AD)
as Pontifex Maximus

Augustus tried in part to protect the Roman race. Between 2BC and 4AD he enacted laws that were intended to reduce inter-breeding between Romans and non-Romans. These laws prohibited an indiscriminate emancipation of slaves, prohibited freed slaves from marrying Latins and prohibited Senators from marrying freed women. If a father caught his adulterous daughter in his home or that of his son-in-law, he was in legal rights to kill the adulterer, and was even permitted to kill his own daughter. She would bring dishonor to the family. This was the Age of Ovid (43BC-17AD) who inspired an era of free love and Augustus banished him to the Black Sea and banished his own daughter Julia to the Island of Pandataria in 2BC who was found guilty of leading an adulterous life exiling her. Augustus's policy was directed at getting Roman citizens to marry. As corruption in the late Republic expanded, the birth rate declined and there was a weakening of the old traditions of Italian family life. As all societies expand and become prosperous, the birth rate decline and imported labor emerges. This is a cycle that has repeated in every empire and has taken place before our eyes today. It is not the end of “materialism” just a sign that we are at the top of a major profound change in our political systems instigated by a massive governmental fiscal mismanagement known as the ***Sovereign Debt Crisis.***

So don’t start selling all your belongings because you fear the coming apocalypse. What we will explore here is the contribution that the Maya have made to our understanding of TIME and its fractal nature in addition to the profound political changes that seem to until in cycles of 300-400 years. We will explore the empirical evidence for earth cycles within nature from droughts, global warming, and the flipping of

the poles. From investigations into such data we will discover that indeed the poles on earth do shift just as they do on the sun every 11 years. However, the cycle on the earth is by no means that short. Nevertheless, yes we are now in the due zone for a pole shift based upon data gathered from the sea floor documenting pole shifts going back millions of years.

According to the legends of the Maya the Supreme Creator god *Hunab Ku* has created four worlds, reconstructing the landscape four times after deluges had poured from the mouth of the sky serpent. What this legend refers to is the four times when god Hunab ku acted as a benefactor and guru to the mortal souls inhabiting the physical plane of earth and aided the people known as the Maya. Mayan legend tells us that the third creation lasted 13 "bak'tuns"; 20 "katun" cycles containing 144,000 days and is equal to 394.26 solar tropical years. However, that is not to say that the fourth world age will also last 13 bak'tuns. The Aztecs made it clear that each previous age (cycle) lasted a different length of time, much like the Greek, Roman, and Hindu cycles. Western interpreters have conflated the steady rhythm of the Long Count calendar with the more fluid paradigm attributed to describing of a "world age". The Christian "periodization" or Six Ages of the World also known as *sex aetates mundi* were first written by **Saint Augustine** *circa* 400 AD. The phases begin with archetypal Christian religious events, like the creation theory and the birth of **Adam** to the events written in the book of **Revelation**. Each of the Christian six ages lasted approximately 1,000 years. This was a widely believed concept in use throughout the **Middle Ages**, and colored the writing of history until the Age of Enlightenment began in **18th century Europe.**

One thing is certain – the Maya regarded the turns of katuns and bak'tuns as times of renewal that were a transformation. Just as the Aztecs held their New Fire Ceremonies at the end of each 52-year cycle, the ancient Maya viewed the end of major Long Count cycles as times for new beginnings. If the ancient Maya could witness the current crop of doomsayers wringing their hands at the looming arrival of the 13th Bak'tun, they would be dismayed. The Maya welcomed these changes through dedicated action, sacrifice, and joyful celebration. It may bring dramatic change, but not the end of the world.

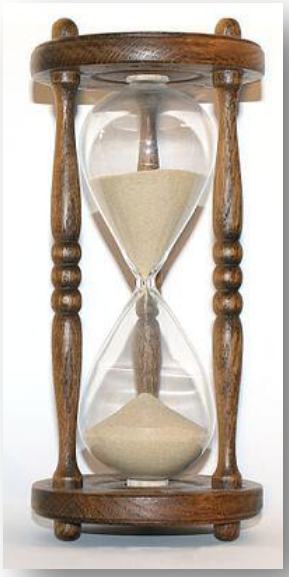
Chapter I

The quest to map time

E all know what **TIME** is; or so we believe. In our modern world it is the ticking of a clock, the buzz of an alarm telling us to get the hell out of bed, the calendar on the wall announces what day it is in our life, and of course the anniversary we just forgot. In this sense, we all agree, **TIME** can seem to be as solid as a rock. Yet is it? Our calendars are far from perfect. We need a leap day every four years to keep them in line with the seasons. But even then, **TIME** will eventually get away from us. For in a few hundred million years, tidal friction will have slowed Earth's rotation enough that the day we measure will be 25 hours long instead of 24 in duration.

Probably to the surprise of many, **TIME** and calendars have both been the subject of constant of political manipulation over the centuries. Of course there is still heated debate over day-light-savings time that was originally meant to assist farmers. Spring forward and Fall backwards. The reason Julius Caesar had to revise the calendar was because politicians kept manipulating it to prevent elections. Then we have most Christian holidays have usurped pagan

holidays because people would be celebrating those days anyway even though they has long forgotten their meaning.



The Mayan exploration of **TIME** is truly fascinating. Their approach to **TIME** is strikingly different than Western thinking. It is revolutionary and will change the way you look at the world entirely. The Mayan discovery of **TIME** stands in direct contrast to Western linear thinking that today blocks the next wave in our journey to reach Enlightenment.

In Western culture, we use the basic structure of the Julian calendar today that stands as witness to the struggle of mankind to be free of corruption that dominates government and prevents us from advancing in our social structural evolution. The Romans had used the Moon as its calendar and it was known that this was wrong. So the job of making adjustments defaulted to the high priest. Well, it doesn't take too much imagination to realize that when it came time for a political election and the polls did not look favorable, the incumbent politicians bribed the high priest to exercise his discretionary power and insert a few days here and there to adjust the **TIME** we call leap year. While Shakespeare and most historians adopted the propaganda of the Oligarchy against Julius Caesar (100-44BC) who was really a man of the people, in truth, the ramped corruption that permeated every aspect of the late Roman Republic cried for reform. Julius Caesar marched upon the corrupt Oligarchy and they fled as the people rejoiced. Caesar instigated major reforms after assuming the political office called a dictator. Of course, we assume a dictator is an evil person who is unelected. In Rome, a dictator was effectively a President for one year who would act when the Senate would be hopelessly deadlocked and make decisions they would often be unable to do. We could use such a political office today to push aside the red tape and just get things done.

Julius Caesar (100-44BC)
as *Pontifex Maximus*

Caesar assumed the position of high priest ***(Pontifex Maximus)*** pictured on his coinage. In this role he reformed the calendar, and established the basic leap year system to stop elections from being postponed thanks to corrupt priests. When Caesar reformed the calendar, what was summer had become winter thanks to the systemic political corruption.

Calendars are man's attempt to divide, define, and measure the passage of **TIME**. In doing so, man had to recognize the cyclical aspect of not just **TIME**, but life in general. TIME contains cycles. One cycle is the week and weekday. You could create a system without years, where the week number keeps on increasing indefinitely. However, such a system would have exposed the seasonal cycle of winter, spring, summer and fall. This now yielded that concept of a solar year.

Then there were the curious changes in the appearance of the Moon, which introduced yet another cycle; the idea of a month. This was defined by the appearance of a New Moon. The moon revolves around its axis and orbits the Earth in exactly the same time of about 27.32 days, relative to the Sun. This results in the moon constantly presenting the same face to the earth. Because the relative positions are always changing, we see different amounts of the lighted portion of the moon from earth. This produces what we call the cycle of these 'phases' as seen from earth, which repeats with a mean (average) interval of 29.530589 days (29 days, 12 hours, 44 minutes, 02.9 seconds). This creates the concept of a month.

The term "moon cycle" (or "lunar cycle") refers to the moon's continuous orbit around the earth every 29.530589 days. As the moon orbits the earth, its appearance (the "phase") changes and thus gives us an indication of the moon's progress in the cycle often called an "age".

The sun illuminates exactly one-half of the moon, which we see it at different angles as it rotates around the earth. This naked eye observation, takes us through the various phases we have given names to each part of the moon cycle, according to how the moon appears to us sitting here on earth. The sequence of one cycle is:

1. **New** (also called the Dark Moon) - not visible
2. **Waxing Crescent**
3. **First Quarter** - commonly called a "half-moon"
4. **Waxing Gibbous**
5. **Full** - we can see the entire illuminated portion of the moon
6. **Waning Gibbous**
7. **Third Quarter** - another "half-moon", but the illuminated part is opposite of the First Quarter
8. **Waning Crescent**
9. **New** - back to the beginning

This complete lunar cycle (New Moon to New Moon) is also called a "***lunation***". During this time the moon will completely circle the earth. So now we have the day defined by the cycle of the rising and setting sun, the month defined by the Moon, the Year defined by the seasons, leaving us with the arbitrary distinction of a week being 7 days.

Most calendars are constructed with these levels of cycles: year, month, and day – (Julian, Gregorian, Islamic, and the Hebrew calendar. Then there are cycles that are synchronized with periodic phenomena, such as the lunar calendar is synchronized to the motion of the Moon (lunar phases) as is the case with the Islamic calendar. A solar calendar is based on perceived seasonal changes synchronized to the apparent motion of the Sun; such as the Persian calendar.

Then we have the "***luni-solar calendar***" which is based on a combination of both solar and lunar synchronizations. Examples of this cyclical combination are the traditional calendar of China, the Hindu calendar in India or the Hebrew calendar.

There are also some calendars that appear to be synchronized to the motion of Venus, such as some of the ancient Egyptian calendars. This synchronization to Venus seems to occur primarily in civilizations near the Equator. Venus tends to be more easily seen in those regions

This brings us to the arbitrary **Week Cycle** that is an example of one that is not synchronized to any external phenomenon such as the sun, moon, or Venus. It is possible that it may have been derived from lunar phases, beginning anew every month. Assuming that the moon circles the earth every 29.53 days, rounding that to 28 days, dividing that in half and half again gives you the period of 7 days. However, the more plausible explanation may be that the average female menstrual cycle is also 28 days long giving rise to the 7 day week from a biological perspective other than the Biblical account that God made the earth in 7 days.

Some calendars incorporate simpler calendars as elements. For example, the Hebrew calendar depends on the ***Seven-Day Week Cycle***. It is also common to operate two calendars simultaneously, as we will explore with the Maya creating a far more complex calendar. Nonetheless, the Gregorian calendar has no inherent dependence on the ***Seven-Day Week Cycle***, but in Western society the two are still used together. We keep track of the day (Monday-Sunday), while we also use the Gregorian date assigning it to the day of week. In this manner, we combine these two cycles ourselves since the Gregorian calendar has no relationship to the day of the week. Consequently, we are beginning to see that measuring **TIME** can be much more interesting and complex than at first glance. We do much without even thinking about what we are doing. It is like walking. We do not consciously think about how to walk, we just inherently walk without thinking about putting one foot ahead of the other. This is where we must explore **TIME.**

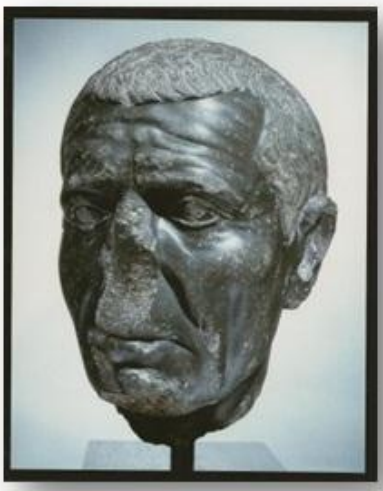
Then there has been the lunar calendar that is one in which days are numbered within each lunar phase cycle. Because the length of the lunar month is not an even fraction of the length of the tropical year dictated by the sun, a purely lunar calendar quickly drifts against the seasons. However, the seasons do not vary much near the equator so we have tended to find lunar

Oldest Lunar Calendar Identified

The interpretation of a dappled, brown horse and a lunar calendar dating back 15,000 years, show the Moon going through its different phases in 29 days comes from Dr Michael Rappenglueck, of the University of Munich.

calendar were used on a prolonged basis in those regions. It does, however, stay more constant with respect to other phenomena based upon the sea such as the ocean tides that are driven by the moon. This is self-evident in the Islamic calendar.

There is prehistoric evidence believed to be lunar calendars that are marks on a bone from about 25,000 BC. Others believe that marks on a 15,000-year old cave painting also represent a lunar calendar as announced in 2000 by Dr Michael Rappenglueck, of the University of Munich. Clearly, early man would have begun studying the passage of **TIME** with the more obvious and shorter lunar movement. Before advancing to a solar concept of the year with changing seasons, man had to invent agriculture before studying **TIME** became something other than a hobby.



Julius Caesar
(100-44BC)

A ***Lunisolar*** calendar is a lunar calendar that compensates by adding an extra month as needed to realign the months with the seasons. An example is the Hebrew calendar which uses a 19-year cycle. This practice was discretionary in Rome and allowed for political corruption prompting reform in 46BC by Julius Caesar (100-44BC). Caesar replaced the typical lunar year and introduced his new calendar based on 365¼ solar days on January 1st, 45 BC. He actually inserted 67 days between November and December making the year 46 BC a one-time calculation of 445 days. He may have even consulted with Greek astronomical calculations assisted by the scholar Sosigenes **(Suetonius, Divus Iulius 40; Cassius Dio, Historia Romana 43,26; Plutarch, Caesar 59,5-6)**. It was Plutarch who reported that when a friend of Cicero remarked that the constellation of Lyra was due to rise next day, Cicero snapped - "***Yes, by edict***." This is merely an example that the Optimates were constantly complain about every reform Caesar would make, illustrating the true character and anti-Republican attitudes those who pretended to be Republicans truly possessed. This was about their power being lost, not about their country.

The Romans pre-Julian Calendar used a "market week" of eight days, marked as A to H in the calendar. A ***nundina*** was the "market day" and is related to ***novem***, meaning "nine," since the Roman system of

counting was actually **inclusive**. The market "week" of 8 days is the ***nundinal*** cycle. This nundinal cycle formed one rhythm of day-to-day Roman life. The “market day” (***nundina***) was the day that country people bring their produce and wares to the city. The city people would buy their eight days' worth of groceries on ***nundina***. For this reason, a law was passed in 287BC (the ***Lex Hortensia***) that actually forbid the holding of any meetings of the *comitia* when elections would be held to ever take place on “market days”. Laws exist today that require businesses to allow employees to go vote. The courts were open for legal disputes on ***nundina.*** In the late republic, a superstition arose that it was unlucky to start the year with a “market day”, and the ***Pontifex Maximus***, who regulated the calendar, took steps to avoid that event by inserting days to manipulate the fortunes of Rome and its people.

Julius Caesar (100-44BC)
Venus hd rt/Aeneas carrying Anchises

There appears to be great confusion over the start and end of the calendar year. Clearly, the calendar year originally began on the first of March. This is demonstrated by the subsequent names of the next six months following March; (Quintilis = 5th month, Sextilis = 6th month, September = 7th month etc.). Keep in mind that *Quintilis* (quintus = five) was changed to July in 45BC in honor of Julius Caesar’s calendar reform. In 8BC August was named after Julius’ nephew Octavian who was given the title of ***Augustus Caesar*****,** meaning father of his country in 27BC. Octavian had still held the title of “**Princeps”** meaning ***“Prince”*** and thus his new title “Augustus” was even more impressive. However, in 8BC when Sextilis was renamed August, a day was taken from February and added to August to make it 31 days equal to that of July having 31 days so not to slight him relative to his uncle, Julius Caesar.

During the Roman Republic, the years were not counted. Instead they were named after the consuls who were in power at the beginning of the year. This would be like calling year 2012 the fourth Year of Obama. However, we find in the later Republican era, contemporary historians and scholars began to count years from the founding of the city of Rome. Different scholars used different dates for this event. Today, the date most widely used for this event is that calculated as 753BC by **Marcus Terentius Varro** (116–27 BC). This was a period of great nostalgia that may have been politically motivated to portray Rome as an enduring empire.

Publius Vergilius Maro (70–19BC), normally known as Virgil, was also a Roman historian of the Augustan period. He is known for three major works, the Eclogues, the Georgics, and the epic Aeneid. It was the Aeneid that follows the Trojan refugee Aeneas of the royal family of Troy as he struggles to fulfill his destiny and arrive on the shores of Italy founding Rome. Julius Caesar issued coins claiming Aeneas was an ancestor. This implies there was certainly some political benefit to Virgil’s Aeneid and may have been politically motivated as think tanks in Washington, DC produce whatever studies patrons desire.

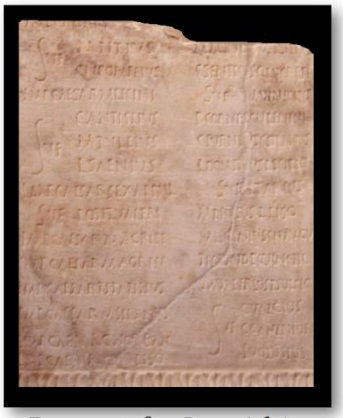
The first day of the political consular term was effectively the first day of the year. This became the 1st of January in 153 BC. Before then it was the 15th of March – the Ides. It does appear that the first day of the year before that may have been the 1st of May during the 3rd century BC until about 222 BC. **Titus Livius Patavinus** (59BC–17AD) commonly known as **Livy,** was a **Roman** historian who also wrote a monumental history of Rome and the Roman people - ***Ab Urbe Condita Libri***, "*Books from the Foundation of the City*".

Livy covered the period from the earliest legends of Rome beginning with the date 753BC through the reign of **Augustus** in Livy's own time. Livy mentions consulates starting on the 1st of July before the 3rd century BC.

Varro states, according to **M. Fulvius Nobilior** (consul in 189 BC) who had composed a commentary on a ***fasti*** preserved in the temple of ***Hercules Musarum***, that January was named after **Janus** because the god faced both ways, which implies that the calendar year started in January in his time. Janus was the symbol of a cyclical change, the departing of one era and the birth of another. A surviving calendar from the late Republic proves that the calendar year started in January before the **Julian reform**. Roman ***Fasti,*** chronological or calendar-based lists, have survived providing us with evidence of how the Romans recorded time.

Nero (53-68AD) Æ Sestertius
Temple of Janus

Janus' shrine consisted of two doorways that traditionally were left open in time of war and kept closed when Rome was at peace. Leaving the doors open in time of war symbolized the new era that was possible. According to Livy, the celebrated Roman historian, the gates to the shrine were closed only twice, during the period of ***Numa Pompilius*** in the 7th century BC, and again for the ***Pax Romana*** during the reign of Augustus.



Fragment of an Imperial-Age
Roman Consular *Fasti*,
in the Museo Epigrafico, Rome

The Julian reform lengthened seven months creating every other month with 31 days and replaced the discretionary intercalary month with an intercalary day to be added every four years to February – leap year. This produced a noticeably more accurate calendar, but it was based on a length for the solar year that was 365 days and 6 hours (365.25 d). In fact, the solar or tropical year is about 11 minutes and 14 seconds less than that. This had the accumulative effect of adding about three quarters of an hour every four years. The effect accrued from 325AD until by the 16th century, when the ***Northward Equinox*** fell on March 10th or 11th.

It was Pope Gregory XIII (b: 1502; Pope 1572-1585) who was faced with the whole problem of dating Easter. The motivation for the Gregorian reform was that the Julian calendar assumes that the time between ***Vernal Equinoxes*** was 365.25 days, which was too long creating a gradual drift in the holiday over the centuries. This error was plainly evident astronomically. The discrepancy accumulates at the rate of about three days every four centuries, resulting in the equinox being on March 11th *(a cumulative error of about 10 days since Roman times)*, and moving steadily earlier in the Julian calendar.

Pope Gregory XIII
(b: 1502; Pope 1572-1585)

Easter was tied to the ***Spring Equinox***, and this prompted the Roman Catholic Church to revise the calendar to consider that this steady movement in the date of the equinox was undesirable. The aim of the Easter Dating Method is to maintain, for each Easter Sunday, the same season of the year and the same relationship to the preceding astronomical full moon that occurred at the time of his resurrection in 30AD. Easter Sunday is the Sunday following the ***Paschal Full Moon*** (PFM) date for the year *(Paschal is pronounced "PAS-KUL", not "pas-chal")*. In June 325AD astronomers approximated astronomical full moon dates for the Christian church, calling them ***Ecclesiastical Full Moon*** (EFM) dates. From 326AD the PFM date has always been the EFM date after March 20 *(which was the equinox date in 325AD).* Orthodox churches became fully autonomous in 1054AD, and celebrate their Easter always on the basis of the Julian calendar and the 19 PFM dates table.

The Gregorian calendar reform contained two parts: a reform of the Julian calendar as used prior to Pope Gregory's time and a reform of the lunar cycle used by the Church, with the Julian calendar, to calculate the date of Easter. Pope Gregory XIII issued a papal bull, ***"Inter Gravissimus"*** on February 24th, 1582 that established the Gregorian calendar as the new and official calendar of the Catholic world. Since the Julian calendar had fallen ten days behind over the centuries, Pope Gregory XIII designated that the Julian calendar date Thursday October 4th, 1582 was followed by the Gregorian calendar date Friday October 15th, 1582. The 10 dates October 5th to 14th were actually removed. The news of the calendar change was disseminated across Europe. Not only would the new calendar be utilized but ten days would be "***lost***" forever, the New Year would now begin on January 1st instead of March 25th, and there would be a new method of determining the date of Easter.

Only a few countries were ready or willing to change to the new calendar in 1582. It was adopted that year in Italy, Luxembourg, Portugal, Spain, and France. The Pope was actually forced to issue a reminder on November 7th to nations that they should change their calendars and many did not heed the call. However, Pope's command was not universally followed. By 1582, Protestantism had spread across the continent and politics and religion were in disarray; additionally, the Eastern Orthodox Christian countries would not change for many years.

Martin Luther
(1483–1546)

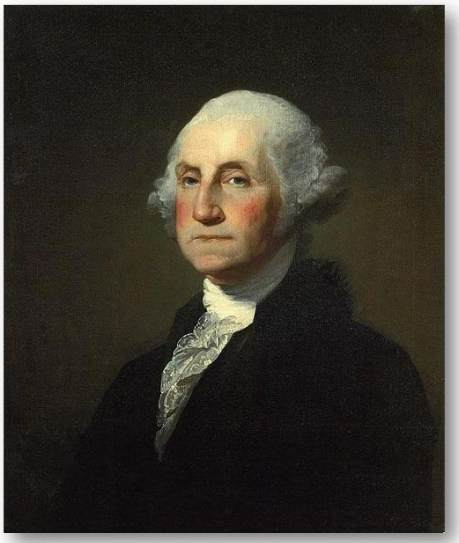
Before this calendar was instituted there was a rising tide against the Catholic Church building momentum during the 16th century. **Martin Luther** (1483–1546) confronted the commissioner of indulgences for all of Germany, **Johann Tetzel** (1465–1519), on the eve of ***All Saint's Day*** October 31st 1517. Luther posted his *Ninety-Five Theses*, composed in Latin, on the door of the Castle Church of Wittenberg. This incident resulted in Luther's **excommunication** by **Pope Leo X** (1475 –1521) and condemnation as an **outlaw** by the Emperor of the Holy Roman Empire.

There were many Puritans in England and the first American colonists (Pilgrims) also refused to adopt anything the Pope would decree. Additional religious Protestants (protestors) such as the French Huguenots also refused to accept the new date because it came from the Pope. Others perhaps were what you might call country "hicks" who lived remotely enough and did not learn about the reform and continued to celebrate New Year's Day on April 1st.

Other countries later joined the fray over the following centuries. Roman Catholic Germany, Belgium, and the Netherlands switched by 1584; Hungary changed in 1587; Denmark and Protestant Germany switched by 1704; Great Britain and its colonies changed in 1752; Sweden changed in 1753; Japan changed in 1873 as part of Meiji's Westernization; Egypt changed in 1875; Albania, Bulgaria, Estonia, Latvia, Lithuania, Romania, and Turkey all changed between 1912 and 1917; the Soviet Union changed in 1919; Greece switched to the Gregorian calendar in 1928; and finally, China changed to the Gregorian calendar after their revolution of 1949!

Change wasn't always easy, however. In Frankfurt as well as London, people rioted over the loss of days in their lives. With each change to the calendar around the world, laws established that people could not be taxed, paid, nor would interest accrue over the "***missing***" days. It was decreed that deadlines still had to take place in the correct number of "***natural days***" following the transition.

In Great Britain, Parliament legislated the change to the Gregorian calendar (by this time simply called the New Style calendar) in 1751 after two unsuccessful attempts at change in 1645 and 1699 because of the hatred toward Catholics. They decreed that September 2nd, 1752 would be followed by September 14th, 1752. Britain needed to add eleven days instead of ten because by the time Britain changed, the Julian calendar was eleven days off the Gregorian calendar and tropic year. This 1752 change also applied to the American colonies of Britain so the change was made in the pre-United States and pre-Canada at that time. Alaska didn't change calendars until 1867, when it transferred from a Russian territory to a part of the United States.



George Washington

(Born on February 11th, 1731 (Old Style), his birthday became February 22nd, 1732 (New Style) Died December 14th, 1799 (N.S.); President: April 30th, 1789 - March 1797)

In the era after the change, dates were written with O.S. (Old Style) or N.S. (New Style) following the day so people examining records could understand whether they were looking at a Julian date or a Gregorian date. While George Washington was born on February 11th, 1731 (O.S.), his birthday became February 22nd, 1732 (N.S.) under the Gregorian calendar. The change in the year of his birth was due to the change of when the change of the New Year was acknowledged. Recall that prior to the Gregorian calendar, March 25th was the New Year but once the new calendar was implemented, it became January 1st. Therefore, since Washington was born between January 1st and March 25th, the year of his birth became one year later upon the switch to the Gregorian calendar (Prior to the 14th century, the New Year change took place on December 25th).

Pope Gregory XIII altered the leap rule making it century years that are not divisible by 400 would not be leap years. This was part of the adjustment of the 11 minutes and 14 seconds discrepancy in the Julian calendar that over centuries shifted the equinox by a day. Thus, 1700, 1800, and 1900 were not leap years, as will be the case for 2100, 2200 and 2300. This rule makes the length of the mean year 365.2425 days (365 d, 5 h, 49 min, 12 s). While this does not synchronize the years entirely, it would require a few thousand years to accumulate to the point of shifting a full day.

The popular explanation of ***April Fool's Day*** is also linked to Pope Gregory XIII's reform. In 1582, when Pope Gregory XIII ordered the new calendar to replace the old Julian Calendar, which was met by much. The new calendar called for New Year's Day to be celebrated January 1st where it is unclear how in the medieval times the New Year began on March 25th. It is true that the Romans at one point celebrated New Year's Day on or around March 15th the ***Vernal Equinox*** (March 20th or March 21st) when the Sun crosses directly over the Earth's equator. However, this appears to have been moved to January 1st at least by 189BC. In the Southern Hemisphere, this is the moment of the ***Autumnal Equinox***.

Somehow after the fall of Rome, the New Year once again became the ***Vernal Equinox***. This is possible given that civilization died being transformed into a feudal world as people abandoned the cities. The Romans called this trend "***suburbium***" – moving to the suburbs. Civilization was replaced by the traditions of Celtic culture. This included the Druids in England and Stonehenge. Therefore, by medieval times, much of Europe celebrated March 25th, the ***Feast of Annunciation***, as the beginning of the New Year based upon pagan custom. Since people would celebrate this day anyhow, it became the strategy to usurp pagan festivals and transform them into Christian reasons to celebrate the same day. To some this became a religious festival but that was purely good enough.

Consequently, Pope Gregory XIII moved the New Year to January 1st, in line with the Julian calendar. This resulted in those who resisted becoming the object of jokes that they were called ***"April Fools"*** for they still celebrated the New Year starting April 1st rather than January 1st. Obviously, beginning the New Year on January 1st abandoning April 1st was also getting away from the more pagan spring ritual, albeit in line with the festival of Janus that became New Year's Eve. This part of the reform was more traditionally in line with the very month of January being named after the Roman god Janus who was pictured as having two faces looking forward and backward. He was the symbol of a cyclical change, the departing of one era and the birth of another. It is uncertain whether this was intentional from a symbolic perspective.

Of course some academics will quarrel with this interpretation citing there were ancient days that were celebrated for fools. There was the Roman festival of ***Hilaria***, held March 25 that was day of merriment and rejoicing in the Cybele-Attis cult and in the Isis-Osiris cult, but that date was November 3rd. T the Medieval Feast of Fools, held December 28th. They will often cite In Chaucer's Canterbury Tales (1392), where in the "***Nun's Priest's Tale***" it reads "Syn March bigan thritty dayes and two." This is more likely as copying error in the extant manuscripts since it is more likely that Chaucer wrote, "Syn March was gon." The passage would have originally meant 32 days after April, being May 2nd, which was the anniversary of the engagement in 1381 of King Richard II of England to Anne of Bohemia. Some academics have been desperate to argue that this meant "March 32", and thus was really April 1st. Nonetheless, that does not explain the precise dates of January 1st and April 1st. That tradition of mocking fools was simply carried over and became ***April Fools***, even though there were previous connections.

Such connections of Hercules being the son of god and Jesus Christ helped to get Christianity off the ground during the turmoil of the 3rd century. When the Roman Empire split due to the economic chaos of the 3rd century, the first emperor of the new Gallic Empire, Postumus (260-269AD), portrayed himself as the protector of the people against the corruption of Rome and the image he used was that of Hercules, the human son of a god.

Fountain of Roman goddess Cibeles in a chariot drawn by two lions
Plaza de los Cibiles in Madrid, Spain.

Consequently, the mere existence of a prior theme does not prevent the adoption of that theme to a new idea. Hercules helped sell Christianity because people could understand the concept of the son of a god that was still a man. The existence of festivals of ***Hilaria***, from which we derive the word "***hilarious***" ***(ἱλάρια),*** does not negate the ***April Fools*** interpretation of the Gregorian reform. In the ancient Roman religion, ***Hilaria*** were festivals celebrated on the ***Spring (Vernal) Equinox*** to honor Cybele, which was the cult of the Great Mother – ***Magna Mata, Gaia,*** or Earth Mother that we generically call today ***Mother Nature***. ***Hilaria*** became the day of rejoicing that could be a public holiday where the emperor appointed a master of ceremonies. A private "***hilaria***" might be something like a marriage or a birth celebration.

The Roman public holiday was the ***Hilaria Matris Deûm***, which was at that time celebrated on March 25th marking the first day after the ***Spring Equinox***. This became the first day of the year which was longer than the night. This gave rise to the idea of "***spring fever***" marking the arrival of the season of rebirth and the end of winter. This was a day where all kinds of games and amusements took place in honor of Cybele (Mother Nature) pictured riding in a chariot drawn by two lions in the famous plaza named after her in Madrid.

One popular tradition was the birth of masquerades type parties. This lived on and became the "***Mardi Gras***" in French or carnival season in English, celebrated in New Orleans. This celebrates the beginning Lent taking place the day before Ash Wednesday. ***Mardi Gras*** is French for "Fat Tuesday", referring to the practice of the last night of eating richer, fatty foods before the ritual fasting of the Lenten season, which begins on Ash Wednesday. The Catholic Church usurped this Roman festival and made it March 25th, the day of Annunciation when Archangel Gabriel announced to the Virgin Mary that she would become the mother of Jesus Christ, the Son of God, in the Christian calendar. They did the same with Christmas where December 25th was the feast of the Roman sun god – ***Sol***. Even Constantine the Great (272-337AD) depicted himself alongside ***Sol Invictus*** who was seen as the one god who remained unvanquished for the sun always rose and fell regardless how bad the economy had become. Some early Christian writers connected the sun to the birth of Jesus, which Christians believe was prophesied in Malachi 4:2 as the "Sun of Righteousness." A **Cyprian** wrote,

Constantine the Great
(b 272AD; Emperor 306-337AD)
Depicted with Sol Invictus ("Invincible Sun")

according to ***The Catholic Encyclopedia, 1913*****:** *"O, how wonderfully acted Providence that on that day on which that Sun was born...Christ should be born".* The date for Christmas being December 25th can be traced to documents at least as far back as 354AD. Old pagan rituals have continued for centuries, such as Halloween, but have long since lost any sense of their original meaning. By adopting the feast of ***Sol*** for Christmas, the Church recognized that the event was an important festival and they clearly linked Christ with the sun.

Oliver Cromwell (1599–1658)(Lord Protector until he died 1653-1658)

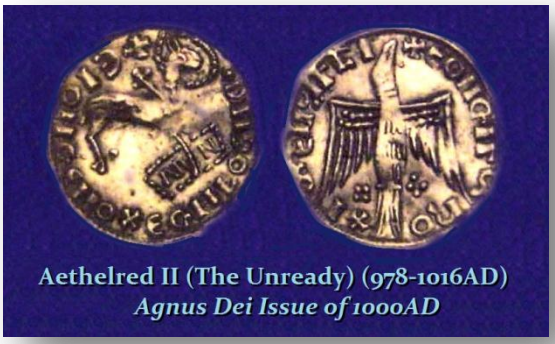
Indeed, when the Puritans seized the government in England and beheaded King Charles I (B 1600; King 1625–1649) enacting all sorts of religious laws from outlawing plays, kissing your wife in public, and outlawed all sports because they led to cursing. Oliver Cromwell placed his own picture on the coinage replacing the king claiming to be Lord Protector (1653-1658). His harsh and outrageous laws of intolerance included also outlawing celebrating Christmas For you see, prior to 1700, celebrating Christmas was still in the pagan ritual sense of being a period where anything goes. The Christmas tree, Santa Claus and all those things are modern inventions.

The Puritans in England had outlawed Christmas because it became merely a drunken Roman ***Saturnalia*** celebration, which was an ancient Roman festival in honor of the deity Saturn originally held December 17th and later expanded with unofficial festivities through December 23rd. The holiday was celebrated with a sacrifice at the ***Temple of Saturn*** in the Roman Forum and a public banquet, followed by private gift-giving, continual partying, all sorts of promiscuity, and gambling was permitted. It was a carnival-like atmosphere that flourished abandoning all Roman social norms and constraints. It was a period where freedom was allowed and masters provided table service for their slaves. It was sort of a king for a day culture. The Roman poet Catullus (ca. 84–54BC) called it ***"the best of days."*** Because masters served slaves,

Saturnalia

this dominated celebrations even into the 17th century. The lower classes saw this as their right. The Puritans were determined to eliminate this frolicking around where social norms were abandoned allowing even free love. The Puritans saw this as far from religion and they had spies going around peeking in your windows to ensure you were not celebrating instead of praying.

During the early Middle Ages, Christmas Day had been overshadowed by Epiphany, when the visit of the magi took place. Nonetheless, the medieval calendar was dominated by Christmas-related holidays such as the forty days before Christmas became the "forty days of St. Martin" of Tours that began on November 11th and today has become known as "***Advent***". Throughout Italy, the ***Saturnalian*** traditions had become attached to ***Advent***. It was party time. These traditions of the 40 days of Christmas are transferred once again evolving into the ***Twelve Days of Christmas*** that became December 25th–January 5th.


Aethelred II (The Unready) (978-1016AD)
Agnus Dei Issue of 1000AD

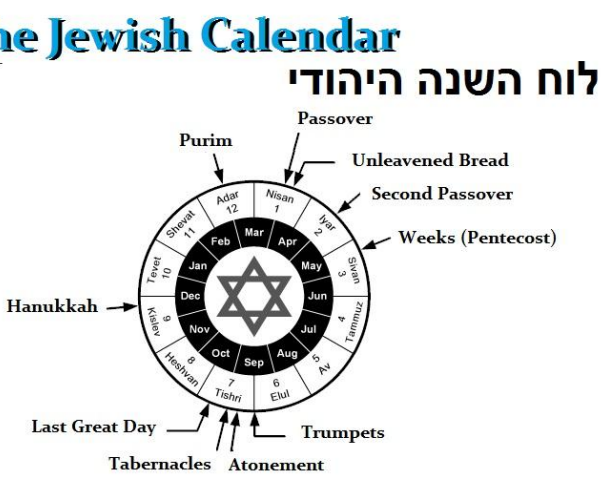
As the year 1000AD approached, there was a wide presumption that the world would come to an end. This became so widespread that in England, King Aethelred II (978-1016AD) removed his portrait from the coinage for 1000AD placing the Christian image of the lamb. When nothing happened, his portrait was restored. This was a period of religious rekindled. Sometime during the 12th century, when the world did not end as expected in 1000AD, we see a surge in pilgrimages to the Holly land. These pilgrimages sparked the Crusades. Pope Urban II made his speech calling for Crusade at the Council of Clermont in November, 1095.

The prominence of Christmas Day as a distinct Christian holiday increased gradually after Charlemagne was crowned Emperor on Christmas Day in 800AD. Then King Edmund the Martyr was anointed on Christmas in 855AD and finally King William I of England, the Conqueror, was crowned on Christmas Day 1066AD. Only with the rise of the Crusades do we see a resurgence of religion and during the High Middle Ages, the holiday had become so prominent that chroniclers routinely noted where various magnates celebrated Christmas. It was King Richard II of England who hosted a Christmas feast in 1377 at which twenty-eight oxen and three hundred sheep were eaten. The Yule boar was a common feature of medieval Christmas feasts as well. The tradition of caroling had also become popular, but this was not religious per se and was originally a group of dancers who sang. We find contemporary writers of the period condemning caroling as lewd, suggesting that the unruly traditions of ***Saturnalia*** included drunkenness, promiscuity, gambling, and a carnival atmosphere. In England, gifts were exchanged on New Year's Day, and there was special Christmas ale brewed. Nevertheless, religion had been struggling to reverse the pagan ways for centuries.

Since the number of days in the solar or tropical year is not a whole number, a solar calendar of 365¼ days as established by Julius Caesar must have a different number of days in different years. This became the need to add an extra day creating leap years. The same applies to months in a lunar

calendar and also the number of months in a year in a ***luni-solar*** calendar. This is generally known as ***intercalation***. Even if a calendar is solar, but not lunar, the year cannot be divided entirely into months that never vary in length.

Virtually every type of calendar system assembles consecutive days into "***months***" and also into "***years***" with the "***week***" being a detached cycle unnecessary for survival. In a solar calendar a year approximates Earth's tropical year as measured by the **TIME** it takes for a complete cycle of four seasons. No doubt, this was motivated by the need to facilitate the planning of agricultural activities. Consequently, understanding the solar cycle became far more vital for survival and commerce compare to the lunar cycle that perhaps had a more practical aspect regarding travel by sea. Consecutive days may be grouped into other periods such as the week that is purely arbitrary as the Roman 8-day market week or the Jewish 7 day week.



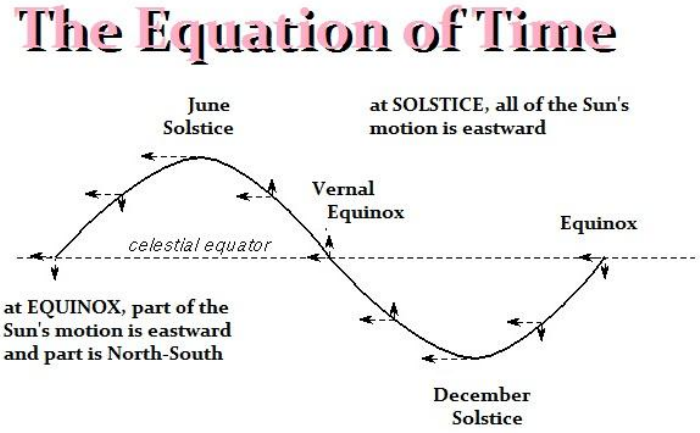
Then there is the problem of where to begin a calendar. Japan based their calendar on the reign of the current emperor increasing each year during his rule on the throne. Roman coins are dated in a similar manner noting the year of consulship. Here we have a historically important coin issued by Octavian during the 7th year of his consulship ("COS VII"). The reverse of this gold aureus announces his victory over Cleopatra and Egypt. He did not boast about defeating Marc Antony who was Roman. The reverse of this coin states boldly – "AEGVPT CAPTA" (Egypt conquered/Captive).

Of course, we also have an astronomical calendar system that is based on ongoing observation. Examples of this type of calendar are the religious Islamic and the old religious Jewish calendar in the time of the Second Temple. Such a calendar is also referred to as an observation-based calendar. The advantage of such a calendar is that it is perfectly and perpetually accurate. The disadvantage is that working out when a particular date would occur is difficult.

An arithmetic calendar is one that is based on a strict set of rules; an example is the current Jewish calendar. Such a calendar is also referred to as a rule-based calendar. The advantage of such a calendar is the ease of calculating when a particular date occurs. The disadvantage is imperfect accuracy. Furthermore, even if the calendar is very accurate, its accuracy diminishes slowly over time, owing to changes in Earth's rotation. This limits the lifetime of an accurate arithmetic calendar to a few thousand

years. After then, the rules would need to be modified from observations made since the invention of the calendar.

Then there is what we are beginning to comprehend is perhaps **Biological TIME**. The faster one's heart rate the faster we literally 'run out of time. Perhaps the most surprising thing about **Biological TIME** has been studies on aging. On the one hand **TIME** has little impact on biology, only because we are pre-programmed to disintegrate anyway. In other words, **Biological TIME** is not wear-and-tear, but a genetic program like a time bomb destined to last long enough to propagate. They can determine what you will die from on a predetermined basis. Our hearts are designed to beat just so many times and then that is it – good night Irene. What if **TIME** functions around us in the same manner? Has Western society been trying to construct a Map of **TIME** that is static and linear when it is really a nonlinear dimension?



The Equation of Time is the difference between apparent solar time and mean solar time. In other words, there is a cycle to the Sun and the time we measure on a clock is not the TRUE time, but the Mean Solar Time. The Mean solar time, is different from the actual TIME for the same place, that is indicated by a steady clock set so that over the year its differences from apparent real Solar Time average to zero (with zero net gain or loss over the year). Thus, the time we measure we think is constant, but in reality, there is a cycle to time all the time.

The **Equation of Time** is the difference between sundial (solar) and watch (mean) time, which is because watch time is based on there being 24 equal hours in a day whereas actual **TIME** ebbs and flows. The sundial time measures the actual time by the position of the sun. The **Equation of Time** allows the conversion from sundial time to clock time. There are two effects that combine to create the **Equation of Time**.

1.) The tilt in the Earth's rotation axis relative to its orbit around the sun: This is why we have changing lengths of hours during the day.

2.) The Earth's Elliptical Orbit: The Earth actually moves faster when it is closest to the Sun. This is due to Kepler's Second Law which states:

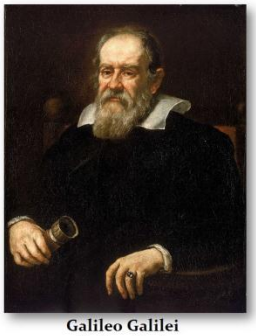
> ***As the planet moves in its orbit, a line from the sun to the planet sweeps out equal areas in equal times.***

To further blow your mind, consider that in physics, **motion** alters **TIME.** In order to get a better understanding of **TIME**, we must understand that time is actually cyclical in its inherent movement rather than linear. Hence, when we create a clock or a calendar, we are in fact taking a nonlinear dimension and constructing a linear straight line to measure it. In truth, a second of **TIME** is a linear measurement of something that does have a variable beat to its structure meaning every second is not the same. Consequently, we arrive at the **Equation of TIME.**

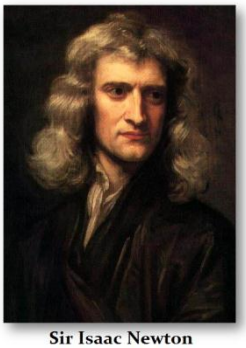
Chapter II

The Fabric of Time

he Mayan Discovery of TIME is fascinating. They viewed **TIME** as a dimension and some say they worshiped **TIME**. There are few societies in Western Civilization that have even considered **TIME** as a dimension. Thanks to Einstein, **TIME** is considered to be the ***Fourth Dimension*** that we must explore to understand how the future unfolds. Measuring **TIME** by a clock or calendar is like trying to smooth out retail sales over the course of a year. Many stores sell up to 40% of their total annual sales during Christmas. We "Seasonally Adjust" our economic statistics to create a smooth straight line by comparing year over year trends (December 2011 and 2012) rather than one month to the next (December to the previous November in the same year). The first method produces a steadier mean, whereas the one month to the next approach reveals the inherent cycle within the economy based upon seasonality.


Galileo Galilei
(1564 –1642)

We are used to the cliché that we live in a three Dimensional (3-D) world. We even have 3-D movies. This 3-D world consists of length, height, and depth. This is how we define mass. However, just about anyone who reads has also heard of Albert Einstein (1879-1955) and his theory of **Relativity** that describes natural events around us. This concerns the most fundamental ideas of time, space, motion, mass, and gravity. Einstein first postulated his theory of ***Special Relativity*** in 1905 and then later the theory of ***General Relativity*** in 1915.


Sir Isaac Newton
(1642–1727)

Before Einstein**,** Galileo Galilei (1564–1642) and Sir Isaac Newton (1642–1727) established the foundation of ***Relativity***. Assuming a train is moving past an outside observer who is stationary along the side of the train tracks, and there is a person on the train throwing a ball at a constant speed. The outside observer standing alongside the tracks sees the ball move at a constant speed equal to the train's speed **plus** the speed at which the person threw the ball. The two actions create a combined speed. The person on the train does not notice his movement speed created by the train so in the train he sees only the speed of the ball coming at him. This is the way that people have been figuring out combined speeds since the days of Galileo and Newton. In this type of world the two frames of reference are within the same temporal universe. Only one universe **TIME** is necessary.

Let us say that you and another individual are standing still on one of those moving sidewalks in an airport. Everything relative to the two of you will be the same. Even your luggage will appear to be stationary at your side. If we look to our left or right, we will observe that all real stationary objects adjacent to the moving sidewalk will appear to be moving backwards. This is of course our perception for we are moving forward ahead of the actual objects yet at the same time we are stationary in the immediate reference. If you played catch with a ball, it too would appear to be same as if you were in a field.

However, to an observer who is stationary on the side, they see that the two of you are moving. Is the ball travelling faster when it is thrown in the direction of your movement and moving slower when it is thrown in the opposite direction? Is the perception of **TIME** different for you on the moving sidewalk **RELATIVE** to the stationary observer on the side?


Albert Einstein
(1879–1955)

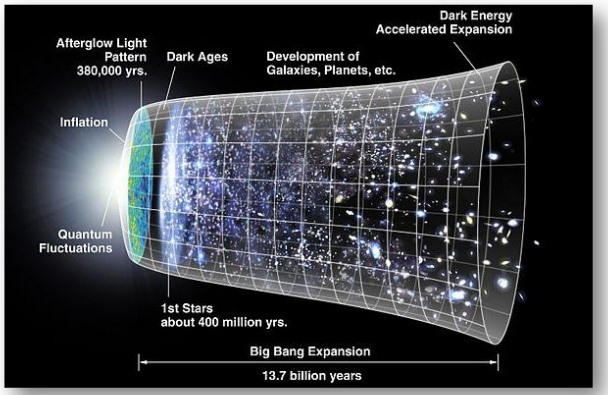
Now comes Einstein and his 1905 ***Special Relativity*** that can be explained fairly easily. Let us say you are on that train moving at a nice steady pace of 300 miles per hour. If you drop a book, it will appear to fall to the floor in a straight line no different than had you been standing in your home. However, if the train is not traveling at a constant speed but can suddenly accelerate or slow down when you drop that book, the fall will no longer be a

Solar System

straight drop relative to the floor. There will be introduced a curve to the trajectory of the falling book. The book will in effect fall still straight down, but the train is now not in sync causing the book relative to the train to appear to fall in a curve rather than in a straight line down.

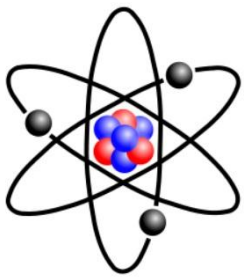
Looking at this another way, if you are on a train and you mount a flashlight on the ceiling shining at a mirror on the floor, the light will travel back to the ceiling at 186,000 miles per hour. If the distance between the ceiling and the floor were 560,000 miles, then the light traveled 1,120,000 miles in total taking six seconds.

Galaxy



The UNIVERSE is defined as the totality of everything that exists

However, to that stationary observer on the side watching this spectacle, it will appear that the light will take ten seconds because the train is moving and the distance the light has to travel has increased to 1,860,000 miles since the light will move sideways with the movement of the train yet as was the case with the falling book. The **TIME** for the two observers will be different.



As you are reading this very paragraph, what do we actually feel? We do not see or feel that in reality we are not stationary at all but we live on a giant moving sidewalk in ***Space-Time***. We are sitting in a specific place on earth, but in reality, the earth is rotating once every 24 hours we call a "day" as measured in **TIME.** There is still another movement. We are simultaneously traveling around the sun taking one year in solar **TIME** to complete one revolution. Then our solar system is revolving within our Galaxy and the Galaxy is revolving within our Universe. Of course there are those who argue religiously against the idea of Big Bang, but there is nothing in the Bible that says God did not create the Universe in that manner.

What is strikingly obvious is that the design structure is ***fractal***. From the very atom itself, the same fundamental structure as the moon revolving around the Earth, the planets around the Sun, the Solar System within the Galaxy, the Galaxy revolving with the Universe, all are the same basic design structure. You might call it God's Blueprint of cyclical activity and how everything truly functions right

down to the revolving biological cell structure and how we sleep at night to be revived with energy in the morning.

Einstein's ***Theory of Special Relativity*** and **TIME** includes electricity and magnetism in a simple, logical extension of the relativity of Galileo and Newton. Its conclusions, including time stretching, length contraction, and $\mathbf{E=mc^2}$ have changed profoundly our ideas of time and space, matter and energy. **Relativity** is something that can really only be proven mathematically. Without math, we can only really touch the surface of a basic concept.

To further illustrate our reality, let us say there is a person standing on the Sun viewing us on Earth. The circumference of the Earth at the equator is 25,000 miles. The Earth rotates in about 24 hours *(23 hours 56 minutes 04. 09053 seconds)*. Therefore, if you were to hang above the surface of the Earth at the equator without moving, you would see 25,000 miles pass by in 24 hours. At that position, 25000 miles/24 hours gives us a speed of just over 1000 miles per hour. However, the Earth is not flat. It is a ball and the circumference is the greatest at the equator. The further you move away from the equator, the slower the earth will appear to spin for

For example, London resides at the Latitude. 54. This means the circumference is about 14,668 miles. If we divide that by 24 hours, we arrive at 611 miles per hour. The length of the day changes the further north or south you move away from the equator. Go to Reykjavik, Iceland and you will see the sun rise on July 8th, 2012 at 3:22 AM and set at 11:41 PM. The length of the day even changes.

Now consider that the Earth is also moving around the Sun at about 67,000 miles per hour. Our observer standing on the Sun will see us moving at 67,000 miles per hour, yet depending on our location on the Earth we will be visible in the sunlight for different periods of time. Now consider that the Sun upon which you stand is itself moving within the Universe in a cyclical orbit around the center point within the Universe. Trying to actually find a place that is stationary is impossible. We cannot rule out that the Universe as we refer to it may be yet revolving around yet another center point among Universes.

Circumference of the Earth

Latitude	Kilometres	Miles
59°	20691.108	12856.8584
58°	21287.83	13227.6443
57°	21877.987	13594.3509
56°	22461.398	13956.8656
55°	23037.887	14315.0793
54°	23607.279	14668.8831
53°	24169.402	15018.1701
52°	24724.086	15362.8348
51°	25271.164	15702.7733
50°	25810.471	16037.8831
49°	26341.846	16368.0642
48°	26865.127	16693.216
47°	27380.159	17013.242
46°	27886.788	17328.0467
45°	28384.861	17637.5349
44°	28874.23	17941.6147
43°	29354.748	18240.1948
42°	29826.274	18533.1874
41°	30288.667	18820.5051
40°	30741.789	19102.0621
39°	31185.505	19377.7744
38°	31619.686	19647.562
37°	32044.202	19911.344
36°	32458.928	20169.0428
35°	32863.741	20420.5819
34°	33258.523	20665.8881
33°	33643.157	20904.8886
32°	34017.531	21137.5138
31°	34381.534	21363.6948
30°	34735.061	21583.3663
29°	35078.007	21796.463
28°	35410.272	22002.9229
27°	35731.76	22202.6863
26°	36042.377	22395.6948
25°	36342.033	22581.8924
24°	36630.639	22761.2238
23°	36908.113	22933.6382
22°	37174.374	23099.0851
21°	37429.344	23257.5161
20°	37672.951	23408.8865
19°	37905.123	23553.1515
18°	38125.794	23690.2701
17°	38334.899	23820.2019
16°	38532.379	23942.9103
15°	38718.176	24058.3592
14°	38892.237	24166.5157
13°	39054.512	24267.3487
12°	39204.954	24360.829
11°	39343.521	24446.9305
10°	39470.171	24525.6272
9°	39584.869	24596.8972
8°	39687.582	24660.7201
7°	39778.281	24717.0779
6°	39856.939	24765.9537
5°	39923.534	24807.3339
4°	39978.047	24841.2067
3°	40020.462	24867.5622
2°	40050.767	24886.3928
1°	40068.954	24897.6937
0°	40075.017	24901.4611

Now let us look at Einstein's perspective. The train is moving past that observer standing alongside the tracks in his apparent stationary spot. The person on the train is shining a flashlight from the ceiling to the floor. The person observing does not see the light beam move at a constant speed equal to the train's speed plus the speed that the person on the train actually sees it leave his flashlight. Speed of Light (according to the train person)

Light is special. This forces the train observer to live in a different temporal universe from the ground observer. His time values will be different for all events.

What is implicit within Einstein's work is not merely motion, but also **TIME**. Einstein realized that the measurement of two objects is effected by the motion that can only be defined relative to **TIME**. Some have argued that **TIME** flows endlessly forward as the universe expands and others have theorized **TIME** might even flow backwards under certain circumstances, yet experiments have failed to support the theory.

Nevertheless, it was the mathematician Hermann Minkowski (1864–1909) who is best known for his work in ***Relativity***, when in 1907 he demonstrated that his former student Albert Einstein's ***Special Theory Of Relativity*** that he unveiled in 1905, could also be understood geometrically as a theory of ***Four-Dimensional Space-Time***. Einstein himself at first viewed Minkowski's algebraic treatment of Einstein's theory was a mere mathematical trick. Eventually, Einstein was open-minded enough to grasp the idea that a geometrical view of ***Space-Time*** would be necessary in order to complete his own later work in ***general relativity*** in 1915. It was Minkowski that concluded that time combines with the other three dimensions of space to form ***Space-Time***.

Hermann Minkowski
(1864–1909)

On September 21st, 1908, Minkowski began his talk at the 80th Assembly of German Natural Scientists and Physicians with his now famous introduction:

> ***The views of space and time which I wish to lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality. [1, p. 75]***

Since that lecture, this question of being; that which is in this union of ***Space*** and ***Time*** has become the subject of a continued debate. Minkowski believed that the theory of relativity implied within our world all objects are four-dimensional since he introduced the unification of ***Space*** and ***Time*** into an inseparable four-dimensional we commonly call "the World". Minkowski further explained:

> ***A point of space at a point of time, that is, a system of values, x, y, x, t, I will call a world-point. The multiplicity of all thinkable x, y, x, t systems of values we will christen the world... Not to leave a yawning void anywhere, we will imagine that everywhere and everywhen there is something perceptible. To avoid saying "matter" or "electricity" I will use for this something the word "substance". We fix our attention on the substantial point which is at the world-point x, y, x, t, and imagine that we are able to recognize this substantial point at any other time. Let the variations dx, dy, dz of the space co-ordinates of this substantial point correspond to a time element dt. Then we obtain, as an image, so to speak, of the everlasting career of the substantial point, a curve in the world, a world-line, the points of which can be referred unequivocally to the parameter t from - oo to + oo. The whole universe is seen to resolve itself into similar world-lines, and I would fain anticipate myself by saying that in my opinion physical laws might find their most perfect expression as reciprocal relations between these world-lines. [1, p. 76]***

As the union of ***Space*** and ***Time*** is a four-dimensional world (Minkowski ***Space-Time***) the question regarding it nature appears to be: *"Is Minkowski **Space-Time** nothing more than a four-dimensional mathematical space which represents an evolving in time three-dimensional world or a mathematical model of a four-dimensional world with time entirely given as the fourth dimension?*" In other words, the issue of the nature of Minkowski ***Space-Time*** is equivalent to the issue of the dimensionality of the world according to relativity - whether the world is 3D or 4D at the macroscopic scale.

Einstein reasoned that if you took a ball and dropped it in an elevator in space, the ball would float in the center of the cab. However, if the elevator cab moves up relative to the ball, the ball would appear to still fall to the floor. Therefore, this became Einstein's ***Principle of Equivalence*** stating that it makes no difference if the object is acted upon by gravity or if the frame of reference is altered. Either way, the same result will take place. Therefore, Einstein reasoned that matter in space distorts the frame of reference in space by curving what we experience as gravity. Hence, the Euclidian *"flat"* geometry cannot describe curved space.

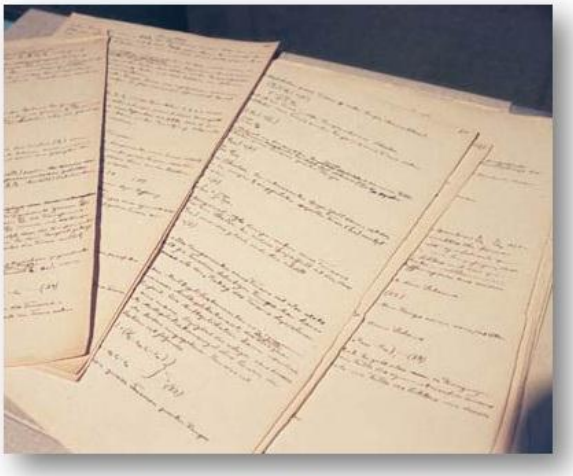
Einstein's famous theory of **General Relativity** was confronted with the question of what happens when objects begin to move in the 3-D world of ours. He postulated what has become the core fundamental principles upon which we can even start a discussion of the ***Maya Discovery of Time***. Einstein established that:

(1) all observers moving uniformly relative to each other, are governed by the same laws of physics and thus have the same form, and

(2) that for all observers, the speed of light is invariant having the same and constant value.

The realizations from these two principles led to the conclusion that mass and energy are related producing the famous equation: **$E = MC^2$**

Neither Einstein nor Minkowski, however, have explored **TIME** in a practical way to allow us to use it to ascertain our immediate environment. When they advertise a new car, they provide statistics that allow you to visualize the power/energy that the car can bring to force relative to motion that is expressed in units of **TIME** - such as 0-60mph in a particular amount of seconds. Therefore, this motion capacity is expressed only in units of **TIME**.



Einstein's original manuscript defining his theory of relativity

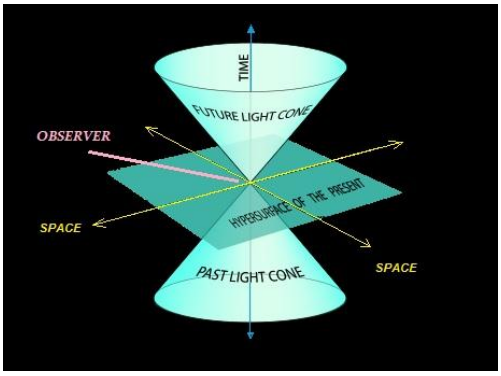
In physics, this has led to the realization that there is a ***Fourth Dimension*** being **TIME**. This has become known most often as ***Space-Time***, which is a mathematical model that combines space and time into a single continuum. Nonetheless, ***Space-Time*** is usually interpreted with space as being three-dimensional

and time playing the role of a ***Fourth Dimension*** separate and apart from the spatial dimensions that we actually see around us. As we will explore, there is so much more to light than literally meets the eye. There is the visible spectrum within light that we can see, and then there is the invisible that includes everything from x-rays to ultraviolet rays. Likewise, we cannot see time, but we can measure its passing. You can pull out a photograph of yourself from the past and see how much things have changed demonstrating the effects of time, yet still not see time itself as a tangible element.

Euclidean space perceptions have revealed the universe with three physical dimensions of space and one fourth dimension of time. What may be shocking to most, is that Albert Einstein concluded in his later years that the past, present, and future all exist simultaneously. This presents an interesting aspect to understanding the ***Business Cycle***. He wrote in 1952, in his book ***Relativity***, on the subject of Hermann Minkowski's (1864–1909) ***Space-Time*** pictured here. Einstein wrote:

> "*Since there exists in this four dimensional structure [space-time] no longer any sections which represent 'now' objectively, the concepts of happening and becoming are indeed not completely suspended, but yet complicated. It appears therefore more natural to think of physical reality as a four dimensional existence, instead of, as hitherto, the evolution of a three dimensional existence."*

Einstein indeed wholly rejected the idea that there were separate elements of the instant we refer to as "**now**". He essentially believed there was no exact division between past and future. Time, he saw, was rather a single existence. Einstein's conception of this interesting concept was perhaps illustrated when his lifelong friend died, Michele Angelo Besso (1873–1955), the Swiss/Italian engineer. Einstein wrote a letter to his family expressing that although Besso had preceded him in death it was of no consequence, "***...for us physicists believe the separation between past, present, and future is only an illusion, although a convincing one.***" Is Time fractal in nature?



Einstein established that **TIME** is relative and not absolute as Sir Isaac Newton had argued. We are traveling through space at a bit more than 67,000 miles an hour as we think we are sitting still here on earth. Yet in our reality, we do not seem to be moving anywhere. Many sci-fi films have been based upon Einstein's theory that everything is relative. If you could travel in a super-fast spaceship, your family at home will experience several years while upon your return you have experienced only a few hours or minutes. If you travelled in the spaceship at near the speed of light, the faster you travel, the slower your time will pass. Still, Einstein's convictions have actually had hardly any real impact certainly on the investigation of time. The majority of physicists have been quite slow to give up the basic ordinary assumptions we make about time because it is difficult to grasp this concept that we could even be no different than a boson.

When we entertain the idea of two objects occupying the same space, it becomes hard to visualize. Einstein I believe explained idea of infinite spaces perhaps best:

"When a smaller box s is situated, relativity at rest, inside the hollow space of a larger box S, then the hollow space of s is a part of the hollow space of S, and the same "space," which contains both of them, belongs to each of the boxes. When s is in motion with respect to S, however, the concept is less simple. One is then inclined to think that s encloses always the same space, but a variable part of the space S. It then becomes necessary to apportion to each box its particular space, not thought of as bounded, and assume that these two spaces are in motion with respect to each other...

Before one has become aware of this complication, space appears as an unbounded medium or container in which material objects swim around. But it must be remembered that there is an infinite number of spaces, which are in motion with respect to each other...

The concept of space as something existing objectively and independent of things belongs to pre-scientific thought, but not so the idea of the existence of an infinite number of spaces in motion relatively to each other. This latter idea is indeed unavoidable, but is far from having played a considerable role even in scientific thought."

Clearly, Einstein revealed here that infinite spaces in motion will at least carry us in the right direction suggesting that space might have an unseen and possibly infinite content. Similar ideas were in fact introduced later by David Bohm (1917–1992), who argued that there were two types of order in nature - ***explicate*** and ***implicate***.

Bohm's ***Implicate Order*** was a statement of how quantum mechanics actually reveals a hidden order where our world is influenced by the whole of all possible states. In the ***Implicate Order*** (enfolded), space and time are no longer the dominant factors determining the relationships of dependence or independence of different elements. Rather, an entirely different sort of basic connection of elements is possible, from which our ordinary notions of space and time, along with those of separately existent material particles, are abstracted as forms derived from the deeper order. These ordinary notions in fact appear in what he called the ***"explicate"*** or ***"unfolded"*** order. This is a special and distinguished form of order contained within the general totality of all the implicate orders ***(Bohm 1980, p. xv).*** Thus, in Bohm's view, ***"things, such as particles, objects, and indeed subjects"*** exist as ***"semi-autonomous quasi-local features"*** of an underlying

David Bohm
(1917–1992)

activity. These features can be considered to be independent only up to a certain level of approximation in which certain criteria are then fulfilled.

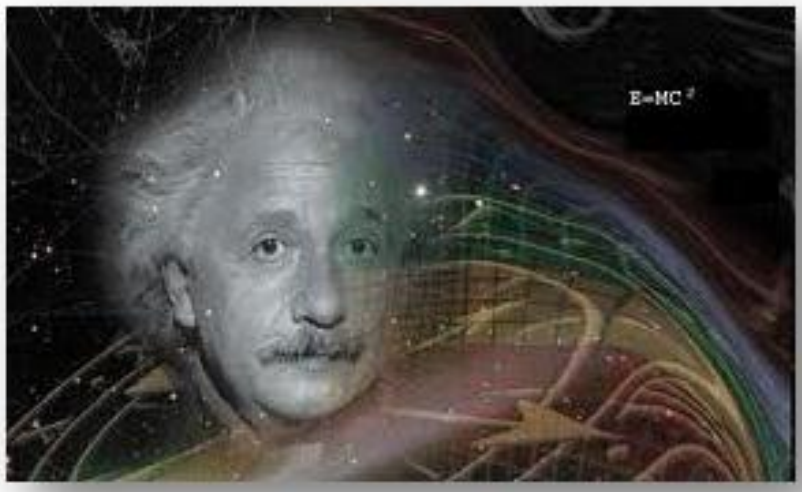
In particle physics, there is this theory of ***Supersymmetry*** where for every type of boson there exists a corresponding type of fermion with the same mass and internal quantum numbers, and vice-versa. In particle physics, bosons are subatomic particles that obey Bose–Einstein statistics. Several bosons can occupy the same quantum state. Bosons contrast with fermions, which obey Fermi–Dirac statistics. Two or more fermions cannot occupy the same quantum state. Since bosons with the same energy can occupy the same place in space, bosons are often force carrier particles. In contrast, fermions are usually associated with matter. If more than one boson can occupy the same space, then is **TIME** truly another dimension that controls the space past, present, and now? As you can see, there are some strange mysteries waiting to be solved.


Richard Feynman
(1918-1988)

Actually, subsequent to Einstein, Richard Feynman (1918-1988) developed the most effective interpretation of quantum mechanics that had yet been developed, known today as ***Sum over Histories*** theory. Where Einstein's own ***Relativity Theory*** led him to see **TIME** being simultaneous (past-present-future) within a strange fractal structure, Feynman's ***Sum over Histories*** theory led him to describe **TIME** simply as a direction in space. Feynman's theory holds that probability of an event is determined by summing together all the possible histories of that event. In other words, in order for a particle to move from point A to B, it can do so by taking many different paths that include everything from a straight line to oscillating paths or a haphazard path that could even amount to two steps forward and one backward. Each path possesses amplitude, and when summed together, the overwhelming majority of all these amplitudes add up to zero. In the end, few histories remain that abide by the laws and forces of nature. Therefore, you could have married the person you fell in love with in grade school, or perhaps high school, college, or at work. You moved from being single (Point A) to married (Point B), but how you got there is a ***Sum over histories*** of possible paths. To make this simple, there is a host of possibilities, and the presumption that the trajectory is always the same is not necessarily correct

According to Einstein, in the same way that a large ball placed on an elasticated cloth stretches the fabric and causes it to sag, so planets and stars warp ***Space-Time***. A marble moving along the sagging cloth will be drawn towards the ball, as the Earth is to the Sun, but not fall into it as long as it keeps moving at speed. Gravity, argued Einstein, was not an attractive force between bodies as had been previously thought.

When Einstein wrote his general theory of relativity in 1915, he found a new way to describe gravity. It was not a force, as Sir Isaac Newton had supposed, but a consequence of the distortion of space and time, conceived together in his theory as ' ***Space-Time*** '. Any object distorts the fabric of ***Space-Time*** and the bigger it is, the greater the effect. Just as a bowling ball placed on a trampoline stretches the fabric and causes it to sag, so planets and stars warp ***Space-Time*** - a phenomenon known as the 'geodetic effect'. A marble moving along the trampoline will be drawn inexorably towards the ball. Thus the planets orbiting the Sun are not being pulled by the Sun; they are following the curved ***Space-Time*** deformation caused by the Sun. The reason the planets never fall into the Sun is because of the speed at which they are travelling. It is like putting water in a bucket tied to a rope and spinning it above your head so fast that the water never escapes. Hence, according to the theory, matter and energy distort ***Space-Time***, curving it around them creating what is known as 'Frame dragging' that theoretically occurs when the rotation of a large body 'twists' nearby ***Space*** and ***Time***. It is this second part of Einstein's theory that the NASA mission has yet to corroborate.



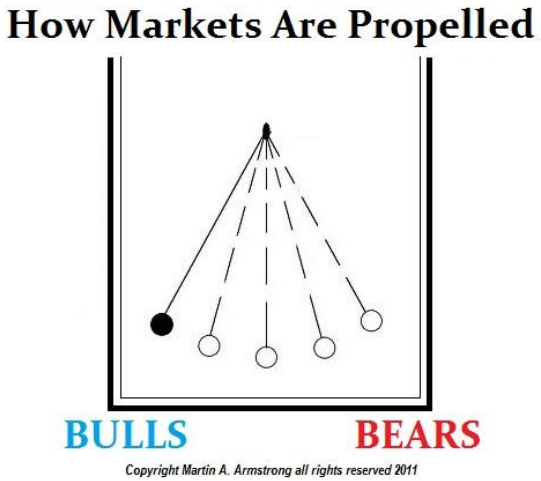
It is well understood that Einstein proved that **TIME** is relative and by no means absolute as Newton has argued. It was Einstein's own **Relativity Theory** that led him to reject time. With the proper technology, such as a very fast spaceship, one person is able to experience several days while another person simultaneously experiences only a few hours or minutes. The same two people can meet up again, one having experienced days or even years while the other has only experienced minutes. The person in the spaceship only needs to travel near to the speed of light. The faster they travel, the slower their time will pass relative to someone planted firmly on the Earth. If they were able to travel at the speed of light, their **c** would cease completely and they would only exist trapped in timelessness. Einstein could hardly comprehend there were physicists who didn't believe in timelessness, and yet the wisdom of Einstein's convictions had very little impact on cosmology or science in general. The majority of physicists have been slow to give up the ordinary assumptions we make about **TIME**. Despite Einstein's conclusions, there has been little acceptance of the idea of a timeless perspective within the universe. We remained trapped by our perceptions of her and now against the past and future within which we live. This is so mentality ingrained within the mainstream of physics and society as a whole, that progress in fully understanding **TIME** seems often at a standstill.

What is still not quite resolved in modern physics is how to properly combine ***Quantum Theory*** with Einstein's ***Relativity Theory***. It appears evident that **TIME** is purely a direction in space but how then do we explain the uncertainty of quantum mechanics? Why does it appear that God plays dice with the world. The two theories, each having been proven by their usefulness, do of course tell the same story about this one universe, but we just haven't learned to comprehend the whole. Some have argued a new theory known as the *No Boundary Proposal*, put forth by Stephen Hawking and Jim Hartle. This theory introduces yet a second reference of **TIME** which has been unfortunately named ***Imaginary time***. Hawking, writes of the no boundary proposal, ***"The universe would be completely self-contained and not affected by anything outside itself. It would neither be created nor destroyed. It would just BE."***

"I cannot believe that God plays dice with the universe."

Steven Hawking has suggested that thus ***Imaginary Time*** can be found at right angles to ordinary time. This implies that this is like an old 8mm movie with each picture a independent shot yet when run through a projector creates the image of a sequential movie. Each frame becomes a static slice of **TIME**. Some claim this explains why particles move in a wave formation rather than in a linear straight line from point A to point B. Under these theories, **TIME** is created purely out of space.

However, perhaps we are complicating everything and what we need to understand is that the wave motion (cycle) is simply how energy moves propelling itself as it moves between two extremes as a pendulum that is also driven by gravity. This is the same mechanism that drives markets the swing between **BULLS** and **BEARS** where people change their mood moving back and forth. As each group picks up new converts, it gains strength and momentum. Gravity enters as some news event that causes them to panic and rush to reverse their position be it buy for bears or sell for bulls. In the world of physics, the swing between two extremes creating the wave formation of traveling particles may be the real answer as to simply how energy moves.



Sooner or later, everyone becomes aware that **TIME** is running out. Most of us live in a sort of oblivion ignoring the existence of that clock until old age when the bones creek and the pains shoot so that

many welcome and end to **TIME**. Others live in such fear that the end of TIME could snatch them away that they are afraid to live for fear of accidental death. The waste the very gift of life in fear of its loss.

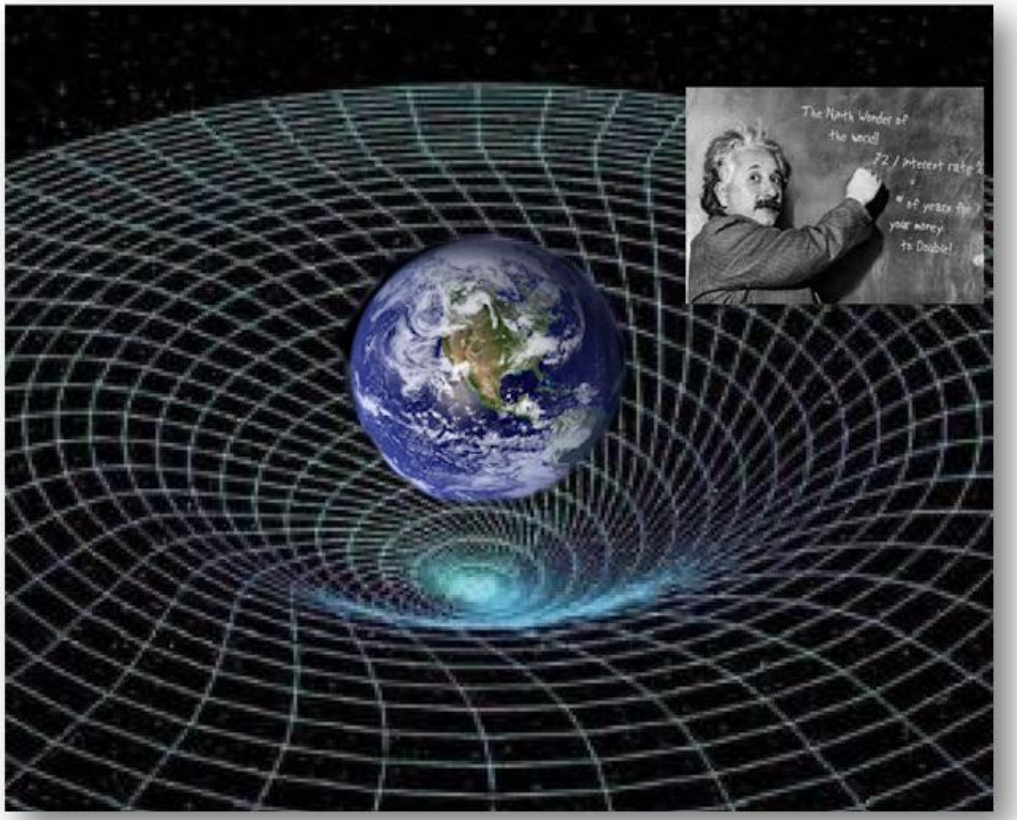
Physics tells us that all moments exist equally, at once--it's only our consciousness that distinguishes the present from the past or future. They say when you die, your life unfolds before your eyes like a movie; the full DVD in a single instant. The Future comes to an end as the past and present merge into one. In this respect, Einstein may be correct. It all becomes the same and it is our consciousness that distinguishes by delineating **TIME** into understandable chunks. **TIME** is quite tangible. It can be quantified, measured, and defined, yet simultaneously it remains quite intangible and arbitrary.

Chapter III
Multiple Universe Alternatives

The question that emerges is often shocking to the uninitiated- ***"Are there multiple universes also revolving in a fractal manner, where does this fractal blueprint of God end?"*** Even in the Bible, Genesis 1:1-31 states: ***"In the beginning, God created the heavens and the earth."*** These are two distinct things. A long tradition of dividing the visible skies into four precedes the modern definitions of four galactic quadrants or the four corners of the universe. The Ancient Mesopotamian formulae spoke of ***"the four corners of the universe"*** and ***"the heaven's four corners",*** see: *Geography and Ethnography: Perceptions of the World in Pre-Modern Societies* (Kurt A. Raaflaub, Richard J.A. Talbert)**.** The Biblical Book of Jeremiah echoes this phraseology: ***"And upon Elam will I bring the four winds from the four quarters of heaven"*** (Jeremiah, 49:36). Clearly, there has been a long standing view that there is a universe out there that is much bigger than our world alone.

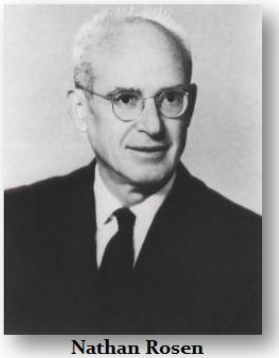
Contrary to what you might expect, the theory of **Multiple Universes** is actually based upon part of Einstein's conception of **TIME**. The idea of parallel worlds may seem at face value to be pure fiction. Nonetheless, this vision of **Multiple Universes** is far from mere science fiction. According to a poll of 72 leading physicists conducted by the American researcher David Raub in 1995, (published in the French periodical ***Sciences et Avenir*** in January 1998), the multiple universe theory is widely accepted with 58% of physicists including Stephen Hawking. Only

about 18% do not accept this theory, while 13% admit the possibility, but remain unconvinced and with the final 11 % expressing no opinion.



Einstein - Black Holes & Multi-Universes

Einstein's ***Theory of Relativity*** predicted the existence of "black holes", a hypothesis which has since been verified. These cosmic phenomena arise from the death of a star, after it collapses in on itself under the force of its own gravity. Inside a black hole, gravity is so intense that even light cannot escape the gravitational field (hence the name black hole).



Nathan Rosen
(1909–1995)

Albert Einstein and another physicist by the name of **Nathan Rosen** (1909–1995) posited that each black hole would rest symmetrically on another gravitational well called a "white hole". The black hole/white hole pair would form a "wormhole" which is a gravitational vortex amounting to an inter-dimensional passage called an Einstein-Rosen Bridge. Any matter swallowed up by the "black hole" would be quickly ejected out by the "white hole", in an

unknown location. This could be either a distant point in the same universe producing a shortcut through *Space-Time*. Alternatively, it could be a parallel universe, in which case it would act as a bridge between the different dimensions entirely.


Christiaan Huygens (1629-1695)

Much of this concept is based upon understanding light which has not been free from debate. **Christiaan Huygens** (1629-1695) was a Dutch mathematician, astronomer, and a physicist. This brilliant man's work has been lost in history, perhaps overshadowed by Newton and Einstein, yet his work has had a lasting impact upon society to this very day. Huygens is not merely the man who founded ***The Wave Theory of Light*.** He also discovered the true shape of the rings of Saturn and made original contributions to the understanding of the complexity or dynamics in science like the study of action by force upon bodies. And his accomplishments do not end there. His keen interest in exploring and understanding astronomy with an unbiased mind's eye led him to perfect a superior telescope, which used grinding and polishing lenses. This not only allowed him to clearly see the rings of Saturn in 1659 but also discover, Titan, Saturn's moon in March 1655. He was able to distinguish components of the Orion nebula in 1656 and his inquisitive mind did not end there. He began to explore **TIME** (*"horo")* seeking to accurately be able to measure it rather than using the traditional sundial known as the "horologe". In his pursuit of the accurate measurement of **TIME** Huygens invented and patented the gravity swing pendulum clock, modifying and perfecting Galileo's idea. Huygens helped to reshape our ability to measure **TIME** in our modern day.


Rene Descardes (1596-1650)

Huygens was a man of many talents and he grew up during a time when discoveries where being made leading to his dynamic view of the world. His father was a diplomat and friends with **Rene Descardes** (1596-1650) leading his father to introduce him to Descartes' philosophy, published in 1637 entitled *Discourse on Method* Descartes. This set forth four rules for acquiring knowledge that would serve us well to follow today:

(1) Accept nothing as true unless clearly recognized as such;
(2) To solve problems systematically by analyzing them part by part;
(3) To proceed from the simple (seed) to the complex; and
(4) *To review everything thoroughly to ensure that nothing is omitted.*

Following these rules Huygens was taught well at a young age. But applying them he formed the foundation for his rejection of some of the work of Isaac Newton. Huygens befriended **Blaise Pascal** (1623-1662) while he lived in Paris between 1666 and 1681 but his lifelong friend would be the German mathematician and philosopher **Gottfried Wilhelm Leibniz** (1646-1716). It was while he lived in Paris that he published ***Horologium Oscillatorium***, in 1673. This was a truly brilliant work that many relied upon. However, unfortunately for the most part history has ignored Huygens giving him little credit or mention in mainstream thought. This was the first published theory in mathematics of curvatures, and offered a complete solution in the spirit of Descartes methodology of dynamics as the derivation of the formula for **TIME.** This gave birth to the laws of centrifugal force for uniform circular motion. Christiaan Huygens believed in existence of **extraterrestrial life.** Toward the latter part of his life he finished a book entitled *Cosmotheoros* in which he postulated notions of life on other planets. He identified dark spots on Mars and Jupiter and due to his belief that water sustained life, he hypothesized that there was water on these planets. He believed that he would be persecuted based on these theories so Huygens' complete proofs were not published until after his death.

In 1689, Huygens visited London where he met **Sir Issac Newton** (1642-1695) and was invited to lecture at the Royal Society on his own theory of gravity. Newton had published his *Principia* in 1687 incurring much conflict with others based on his beliefs, Huygens being one of the casualties. Huygens' correspondence with Leibniz on this subject matter did survive, which reveals that while he respected Newton's math, his theory of gravity, he regarded as careless and devoid of any mechanical proof. Huygens followed the spirit of Descartes principles, which demanded proof. Anything less than solid evidence he simply regarded as unacceptable.

In 1690, Huygens was prompted to publish his rebuttal to Newton's theories in the ***Discourse of the Cause of Gravity***, with mechanical proof he built upon Cartesian vortices. He also published that same year, his ***Treatise on Light,*** which had been completed back in 1678. This was his mechanical explanation of light, based on his discovery of the principles of optics, for which established his ***Wave Theory***. He explained that the points of light on a wave front may be thus regarded as new sources of wavelets that then expand in every direction at a rate depending on their velocities. This forms the principle for understanding various optical phenomena. The surface tangent to the wavelets constitutes the new wave front and is called the envelope of the wavelets. When the medium through which the light passes is homogeneous, allowing light to travel at a constant speed, the three-dimensional envelope of a point source will be spherical or otherwise it will be ellipsoidal. This explains everything from rainbows to crystals and the reflections of light that are enhanced by various cuts in a diamond. What Huygens discovered here was cyclical behavior, not just that light travels in a wave formation, but this is also how all energy travels right down to sound waves. If energy travels in a wave formation, we begin to see that everything has a cyclical beat from your heart right down to the boom and bust cycles

within the collective social structure we call our economy. There are cycles in weather and there are four seasons in an overall climate. Huygens discovered yet another key to the universe - part of God's Blueprint if you will, he discovered how energy moves. Yet he limited his discovery to the full application of all energy beyond light.

Thomas Young (1773–1829) was a true Renaissance man. He is famous for having partly deciphered Egyptian hieroglyphics (specifically the *Rosetta Stone*) before **Jean-François Champollion** (1790-1832) eventually expanded on his work. Huygens' ***Wave Theory*** regarding the movement of light itself was over-shadowed by Sir Issac Newton's work. However, it was **Thomas Young** (1773-1829) who rescued Huygens' work and though it took time by 1850, it was Huygens who was now accepted as being correct, not Newton.

In Young's own opinion, of Huygens' many achievements the most important was to substantiate the ***Wave Theory of Light***. To do so he had to overcome the century-old view, expressed in the venerable Isaac Newton's *Optics*, that light was a particle. Nevertheless, in the early 19th century Young put forth a number of theoretical reasons supporting Huygens' ***Wave Theory of Light***, and he developed two important demonstrations to support this proposition. He used a tank of water known as a ripple tank where he demonstrated the idea of interference in the context of water waves. He then demonstrated that the same interference took place in light proving it too traveled in a wave formation rather than a linear particle. He created the famous double-slit demonstration as Young explained on November 24, 1803, at the Royal Society of London that was naturally pro-Newton:

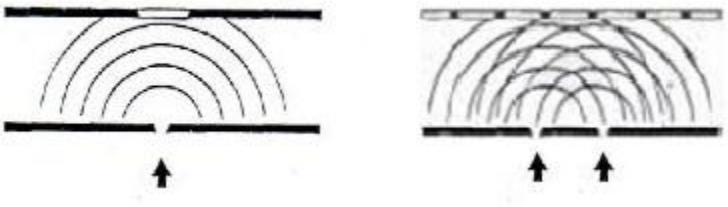
> *"The experiments I am about to relate ... may be repeated with great ease, whenever the sun shines, and without any other apparatus than is at hand to everyone."*

Thomas Young's description of this important experiment was published in the ***Philosophical Transactions*** entitled "Experiments and Calculations Relative to Physical Optics", published in 1804. Therein, Young described the experiment and how he placed a narrow card (approx. 1/30th in.) in a beam of light from a single opening in a window. He then observed the fringes of color in the shadow and to the sides of the card. He observed that placing another card before or after the narrow strip so as to prevent light from the beam from striking one of its edges caused the fringes to disappear. This supported the contention that light is composed of waves. Young performed and analyzed a number of experiments, including interference of light from reflection of nearby pairs of micrometer grooves, from reflection off thin films of soap and oil, and from Newton's rings. Young also performed two important

Thomas Young
(1773–1829)

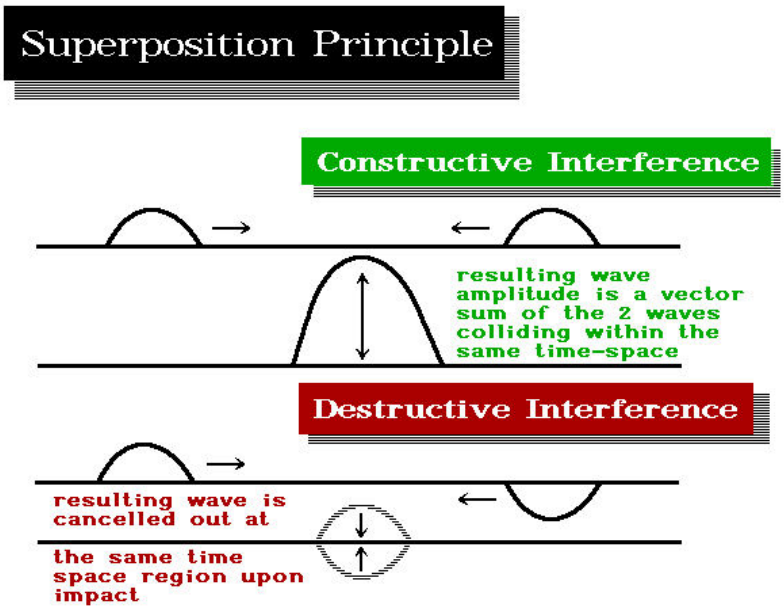
diffraction experiments using fibers and long narrow strips. In his Course of Lectures on Natural Philosophy and the Mechanical Arts (1807) he gives **Francesco Maria Grimaldi** *(1618–1663)* credit for first observing the fringes in the shadow of an object placed in a beam of light.

The experiment began by setting up two walls one in front of the other. The first wall has a single vertical slit cut into it. If we now shine a light into the slit, on the wall behind you will see a single vertical white line. This could certainly have led Newton to believe light traveled as a linear stream of particles.



The light traveling through the single slit travels in waves but at such a speed, Newton could not see that aspect. The experiment gets more interesting, when we cut two slits side-by-side. One would expect now two vertical white lines should appear side by side. This is where wave complexity begins to show its true nature. The wave nature of light causes the light waves passing through the two slits to interfere, producing bright and dark bands on the screen — a result that would not be expected if light consisted strictly of particles. There were no simple two vertical white bands.

If we continue with this simple and plain experiment by now cutting four slits and shine the light again, once more what you expect does not happen. Instead of more, we now are getting less. The theory to explain this is that light travels in a wave form (cycle) and thus where the two waves meet and are in opposite phase, they cancel each other out.



When Thomas Young first demonstrated this phenomenon, it indicated that light consists of waves, as the distribution of brightness can be explained by the alternately additive and subtractive interference of wave-fronts. Young's experiment played a vital part in the acceptance of the *Wave Theory of Light* in the early 1800s. It was Young who proved that Huygens was correct, not Newton. By demonstrating wave interference in water, he was able to show the same interference takes place with light.

Within ten years, much of Young's work was reproduced and then extended by Augustin-Jean Fresnel 1788–1827 an engineer who contributed significantly to the further establishment of the theory of **wave optics**. He is perhaps best known as the inventor of the ***Fresnel lens***, which he developed during his appointment as French commissioner of lighthouses in 1819. His ***Fresnel equations*** on waves and **reflectivity** also form the basis for many applications in **computer graphics** today like the digital rendering of **water**.

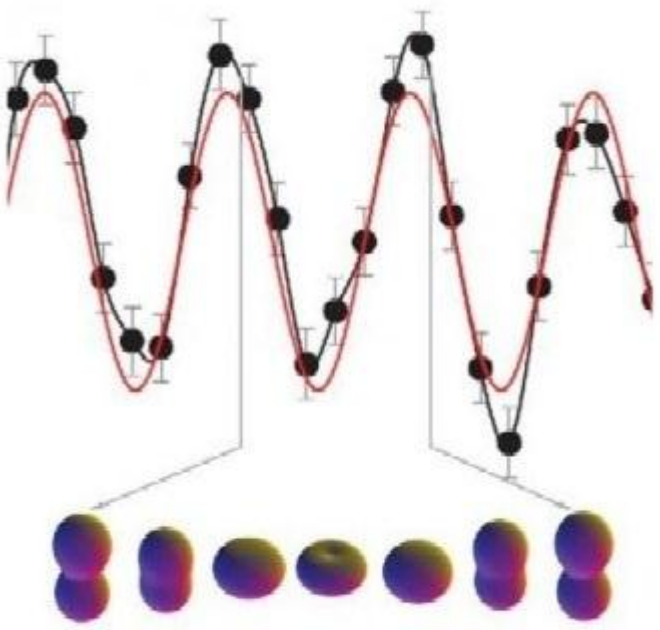
Wave theory sometimes acts in a manner were there are groups of waves that are in-phase and will join together making a larger wave combining the energy of both waves. Waves that are 180 degrees out of phase will cancel each other out when they clash together. It was Young who vanquished the *Corpuscular Theory* of light proposed by Isaac Newton, which had been the accepted model of light propagation in the 17th and 18th centuries. The double-slit experiment has become a classic thought experiment for its clarity in expressing the central puzzles of quantum mechanics. This is because it demonstrates the fundamental limitation of the observer to predict experimental results, and it has presented what appears to be the impossible and reveals the hidden complexity that lies behind everything. This is the very heart of quantum mechanics and in reality the only further mystery.

Now we come to Einstein who argued that light was not a simple wave, but consisted of particles called "photons" that travelled in a wave-like formation. It is then assumed that particles can interfere with each other. The next step in this experiment was to narrow the beam of light to such a small beam that only one photon would come out at a time. Detectors were then set up to record the results. The pattern above shocked everyone once again. The photons appeared to land only in specific places and not others, could there be no other photon creating the interference? What could it be that was creating an interference with the photon when only one photon was coming out at one time? You can see the emerging confusion finding complexity in simplicity.

Quantum Theory has long provided a conundrum in that this world just may be too complex for us to truly comprehend or at least until we blend Huygens' discovery of energy movement. This was similar to the same basic structure of an atom is a fractal design providing the overall enterprise for the solar system, galaxy, and the universe. Each level involves a structure of a core center point around which everything revolves. *Wave Theory* describes the manner in which energy cyclically moves in nature like the energy output of the sun or the beats in a repeated rhythm like your heart. The quest to reach a *Grand Unified Theory* where the laws of *Classical* and *Quantum Mechanics* combine has remained the primary goal among physicists to achieve.

Huygens' discovery of how light travels in cyclical wave formation, has been also argued as proof of multiple universes. Albeit unconvincing to many including myself, this theory of Multiple Universes has been argued via citing an attempt to explain why something really strange and inexplicable happens. This is where the theory of multiple universes emerges on one plane. It is now assumed that because in cyclical wave theory two waves that are out-of-phase by 180^{o} will cancel each other out constituting in one aspect the *Superposition Principle*. Our knowledge of how all energy moves in waves transcends into the comprehension of how even individual photons must behave since they still move in this wave formation. This has produced the theory that there must be multiple universes.

Where the multi-universe theory emerges from this experiment is based on the fact that only one photon is emerging at a time. Thus, there can be no "interference" with another photon. Hence, the theory goes that there must be multiple universes and at the same instant in time a person is shooting a photon at a wall in this universe, the same person existing in a parallel universe is doing the same thing. Thus, the interference is with that photon in the parallel universe. This is certainly creative thinking. Yet, the true and actual answer may be more down to earth. This hypothesis introduces us to cyclical complexity since what we are talking about is cyclical behavior, an ordered principle, by which all energy moves. Therefore, cyclical movement is the essence of everything around us within nature.



Oscillating Quantum States

What is taking place in this simple experiment is that the photon is blinking in and out appearing to disappear and this is what prompted the multiple universe theory. Where does it go? It is just following a cyclical path.

Young's double-slit experiment demonstrates that matter and energy can display characteristics of both waves and particles. This reveals the fundamentally probabilistic nature of quantum mechanical phenomena. In a simplistic version of this experiment, a coherent light source passing through the slits produces amazing results. The wave nature of light causes the light waves passing through the two slits to interfere, producing bright and dark bands on the screen as previously illustrated. This would not be expected if light consisted strictly of particles. On the screen the light is always found to be absorbed as though it were composed of discrete particles or photons. Here we arrive at the principle known as *Wave–Particle Duality*. The detection of individual photons is observed to be inherently probabilistic, which is inexplicable using classical mechanics. If light consisted strictly of ordinary or classical particles, then these particles would move in a straight line through a slit striking the screen behind it. It is the single slit experiment that illustrates that the pattern on the screen is a diffraction pattern, in a very narrow central band with dimmer bands parallel to it on each side. Therefore, if light consisted strictly of classical particles then the expected pattern on the screen would simply be the sum of the two single-slit patterns. In actuality, the pattern becomes wider and much more detailed, including a series of light and dark bands. Young used this to prove light consists of waves and played a vital role in the acceptance of the *Wave Theory* during the early 1800s. With this Isaac

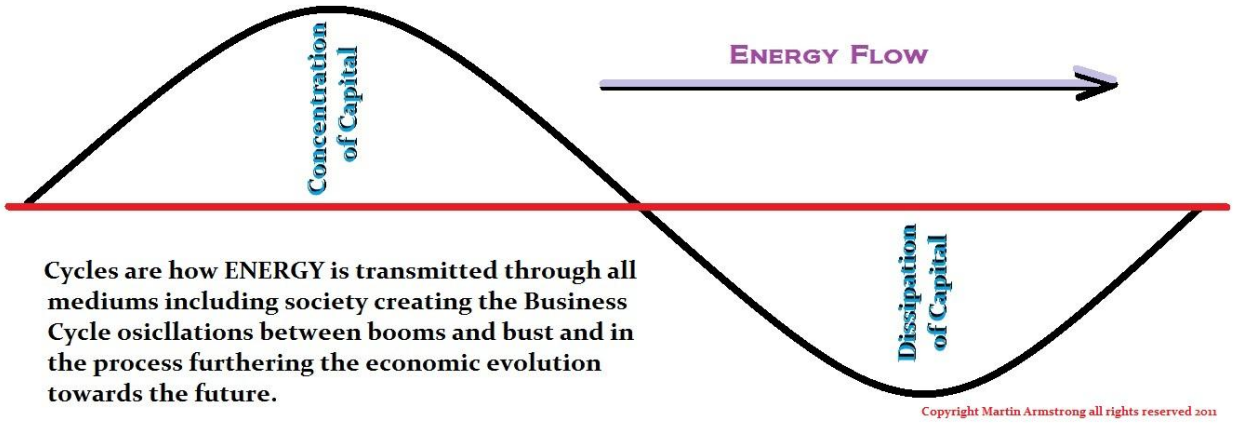
Newton was dethroned in favor of Huygens. It was the later discovery of the photoelectric effect demonstrated that under different circumstances, light can behave as if it is composed of discrete particles and a wave and this exposed the quantum nature of light itself.

The double-slit experiment exposed that there is a cyclical aspect to everything. The missing link that exists is our understanding how energy moves. This phenomenon has become a classic thought experiment for its clarity in expressing the core central puzzles of quantum mechanics. Since the double-slit experiment demonstrates the fundamental limitation of the observer to predict experimental results, this also explains our lack of understanding of the economy and human collective behavior no less how to operate government. Richard Feynman (1918–1988) called this experiment "a phenomenon which is impossible ... to explain in any classical way, and which has in it the heart of quantum mechanics. In reality, it contains the only mystery [of quantum mechanics]."

The blinking in and out of existence of the photon can be explained without invoking multiple duplicate universes. The universe is composed of less than 10% of physical matter (that we can see) with over 70% being *Dark Energy* and the remainder *Dark Matter*. Any interference could be with either the Dark Matter or Dark Energy that we are unable to yet detect. Therefore, there are other theories one can put forth other than multiple universes duplicating ourselves.

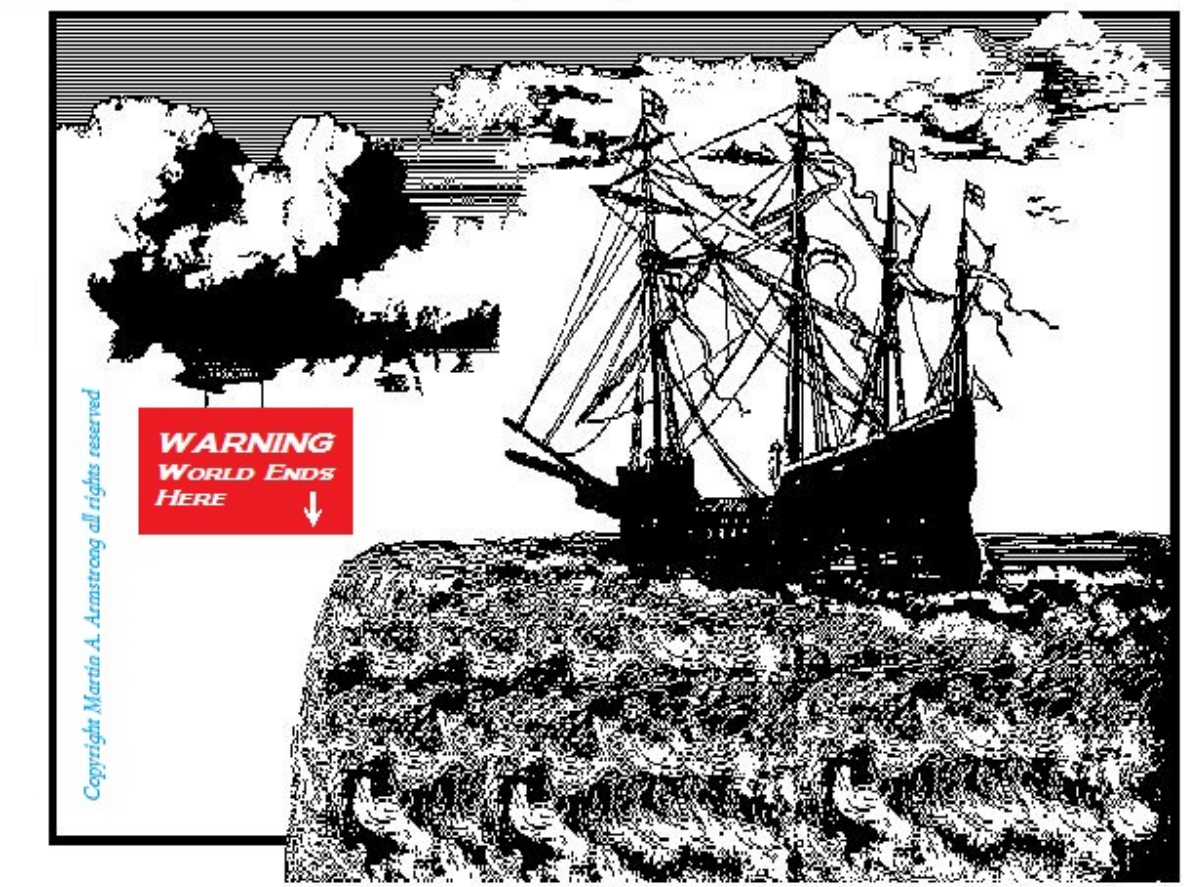
It is entirely possible that the photon is behaving in its normal wave pattern and we are able to see it only when it is at its point of maximum entropy, found at the nadir and the zenith, when it is changing course. It strikes the same spots because of its cyclical path through time and space. The answer lies in cyclical complexity and what we can see as blinking are the points of maximum energy that appear like a pendulum at its two most extreme points. This appears to be the more practical resolution of this experiment and we are only able to see visually the photon at its turning points in its cyclical path. By exploring the cyclical nature of social systems, we can see much clearer into all other areas of science.

Then there is the Wormhole hypothesis that could explain the total absence of antimatter in the universe as we know it. According to the universe's governing principle of symmetry, there must be equal amounts of matter and antimatter. However, we have been unable to discover the slightest trace of antimatter naturally existing. However, antimatter was successfully produced artificially at the CERN laboratory in Geneva, Switzerland in 1995. It has been argued that the existence of parallel universes could explain the lack of antimatter in our world. In parallel dimensions, then, there could be objects similar to the planets and stars we are familiar with in our own, but constructed antimatter.



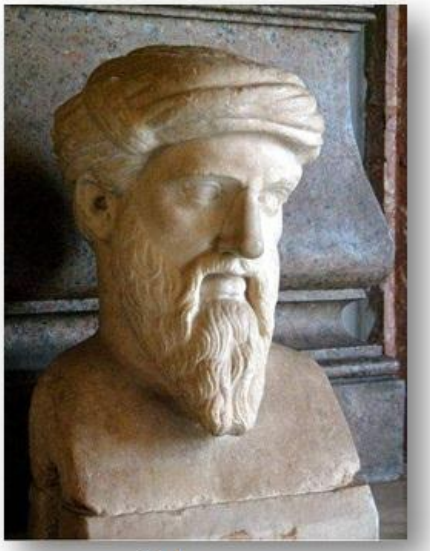
The most important discovery sits right before our eyes. It is *how* energy moves that is the key to the universe. Understanding the ebb and flow of time follows the building block of an oscillating pattern is essential to comprehending the true depth of our world. What the Maya discovered was the cyclical aspect to life. They became the ***"Lords of Time"*** so to speak and that is the true mystery that awaits our exploration. Energy does not flow in a straight line. Yes light is composed of photons, but they flow in a cyclical pattern. As we move forward, we will see that the Maya discovered not the end of the world, but how it is renewed during the intervals of change.

Chapter IV



The Spherical Earth

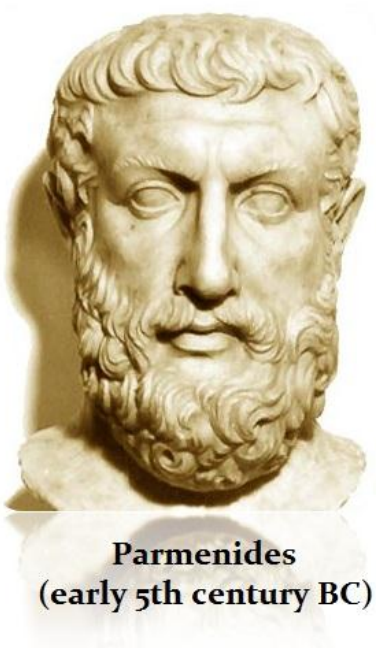
It may seem trivial today, but throughout recorded history, determining that the Earth was round involved a lot of innovative thought which contradicted early civilizations common belief that the Earth was a straight line. Arriving at this though and then proclaiming this idea cost many lives. The earliest evidence that man had figured out Earth was spherical rather than a flat piece of land, comes from ancient Greek sources. Yet there is not one single account of how the shape of the Earth was discovered in antiquity. A plausible explanation could have come from the experiences of sea faring travelers whose propositions would have come from their surveillance of the variation in the observable altitude and the change in the area of



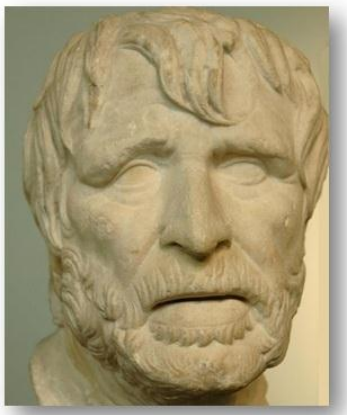
Pythagoras
(c. 570– 495BC)

circumpolar stars. During this time these change would have been quite drastic between Greek settlements around the eastern Mediterranean Sea, particularly those between the Nile Delta and the Crimea.

Keeping in mind that the Greeks tended to attribute every discovery to one of their ancient Wise Men no individual owns sole credit for this theories origination or verification. According to **Diogenes Laertius** (c. 3rd century AD), **Pythagoras** (570–495BC) was the first Greek to have originated the idea of calling the earth round. **Theophrastus** (371–287BC), on the other hand, attributes this discovery to **Parmenide**s (early 5th century BC), who we can say at least seems to have known that the Earth was a sphere. **Empedocles** (490–430BC) is also credited with this discovery in the 5th century BC. **Zeno of Elea** (490–430BC) ascribes this discovery to **Hesiod** (750-650BC). So it can be said that early Greek philosophers alluded to a spherical Earth, albeit with some ambiguity. Perhaps we cannot reliably credit anyone in particular. Nevertheless this discovery seems to have been formulated within the Pythagorean School during the 5th century BC for after the 5th century BC no Greek writer of repute thought that the world was anything but round.

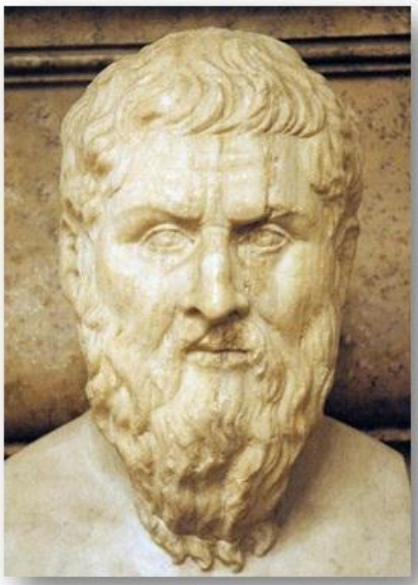


Parmenides
(early 5th century BC)



Hesiod
(c. 750-650BC)

In **Herodotus'** (484–425BC) *The Histories*, written c. 431–425BC, he questions a report of the sun observed shining from the north. This query arises when discussing the circumnavigation of Africa undertaken by the Phoenicians under **Necho II** (610–595 BC) *(The Histories, 4.42).* They reported the sun on their right when circumnavigating in a clockwise direction. However, this actually establishes the truth of the report that the Phoenicians did circumnavigate Africa. In this they may have been the first to open the West to the spices and silk of the East thus giving rise to the Silk Road land route.

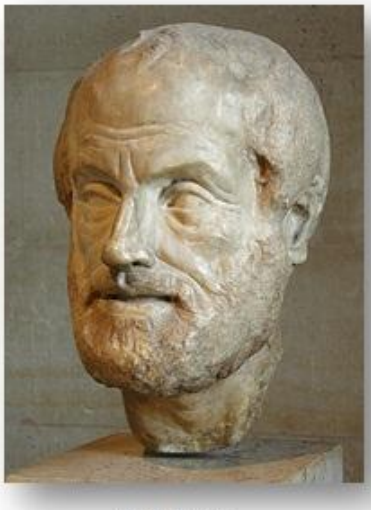


Plato
(427–347 BC)

Plato (427–347 BC) travelled to southern Italy to study Pythagorean mathematics. When he returned to Athens and established his school, Plato taught his students that the Earth was a sphere though he offered no justifications. He writes that if man could soar high above the clouds, the Earth would then resemble *"one of those balls which have leather coverings in twelve pieces, and is decked with various colors, of which the colors used by painters on Earth are in a manner samples."*

In ***Timaeus*** (c. 360BC), one of **Plato**'s dialogues generally available throughout the Middle Ages in Latin, we read that the Creator ***"****made the world in the form of a globe, round as from a lathe, having its extremes in every direction equidistant from the center, the most perfect and the most like itself of all figures****"***. Of course the "world" to the Greeks typically refers to the universe.

Aristotle (384–322 BC) was Plato's prize student and observed *"there are stars seen in Egypt and [...] Cyprus which are not seen in the northerly regions."* This we know is only possible on a curved surface. Aristotle also believed that the Earth was a sphere *"of no great size, for otherwise the effect of so slight a change of place would not be quickly apparent." (De caelo, 298a2–10).* Yet he did provide physical and observational arguments that supported the idea of a spherical Earth: *"Every portion of the Earth tends toward the center until by compression and convergence they form a sphere." (De caelo, 297a9–21)*



Aristotle
(384–322BC)

We find in Aristotle's work he recognized the notions of symmetry, equilibrium and cyclic repetition. In his *Meteorology* Aristotle divided the world into five climatic zones: two temperate areas separated by a torrid zone near the equator, and two cold inhospitable regions, *"one near our upper or northern pole and the other near the ... southern pole,"* both impenetrable and girdled with ice *(Meteorologica,362a31–35).* This depiction proves that clearly Aristotle was aware of knowledge that existed that included the shape of the Earth.

Eratosthenes (276–194 BC) actually estimated the Earth's circumference around 240 BC. He heard that in Syene Egypt the Sun was directly overhead during the summer solstice whereas in Alexandria he knew it still cast a shadow. Using the differing angles in which the shadows made as the basis of his trigonometric calculations he estimated a circumference of around 250,000 *stades*. The length of a "stade" is not precisely known, but Eratosthenes' figure has a minimal error of about five to fifteen percent. He used rough estimates and round numbers and depending on the length, his result is within a margin of between 2% and 20% of the actual circumference of Earth- 40,008 kilometers (24,860 mi).

Erastosthenes (273-192BC)

Seleucus of Seleucia (190-150s BC) was a Hellenistic astronomer and philosopher who lived in Mesopotamia and is best known as a proponent of **heliocentrism** and for his theory of the origin of **tides.** This theory inspired by **Aristarchus of Samos** (c. 310–230BC), whose work is lost to the sands of time, stated that the Earth was spherical and actually orbited the Sun. Though, Aristarchus of Samos's direct work has been lost, a reference has survived in Archimedes' book *The Sand Reckoner.* Where Archimedes describes another work by Aristarchus in which he advanced the heliocentric model as an alternative hypothesis.

From its Greek origins, the idea of a spherical earth, along with much of Greek astronomical thought, slowly spread across the globe and ultimately became the adopted view in all major astronomical traditions. Many Roman authors, including **Cicero** and **Pliny**, refer in their works to the round Earth as a matter of fact.

The Greeks being a seafaring civilization provided the first observational evidence that the Earth was not flat, based on seamen's observations of the horizon. This was noted by the geographer **Strabo** (64BC–24AD) in which he suggested that the spherical shape of the Earth was probably known to Mediterranean seafarers since the time of Homer. He mentions a line from the *Odysse**y*** suggesting that Homer was aware that the Earth was a sphere as early as the 7th or 8th century BC. Strabo cited various phenomena observed at sea that would have suggested to the seafarers that the Earth was spherical. He observed that elevated lights and areas of land were visible to sailors at greater distances than those less elevated and that the curvature of the sea was obviously responsible for this phenomenon.

Claudius Ptolemy
(90–168 AD)

Claudius Ptolemy (90–168 AD) was a famous Alexandria geographer who lived in the great city when it was the center of scholarship during the 2nd century AD. He published the only surviving comprehensive ancient treatise on astronomy, his model of the solar system called the *Almagest,* which became the standard work on astronomy for about 1,400 years. Essentially, Babylonian astronomers had developed arithmetical techniques for calculating astronomical phenomena. Hipparchus had produced geometric models for calculating celestial motions. Ptolemy, however, claimed to have derived his geometrical models from selected astronomical observations by his predecessors spanning more than 800 years. The epoch date for the tables in Ptolemy's *Almagest* that form the default date correspond with mean noon at the meridian of Alexandria on 1 Thoth 1 Nabonassar, or 26 February 747 BC in the Julian calendar, around 10h UT.

Ptolemy presented his astronomical models in tables that could be used to then compute the future or the past positions of the planets. The *Almagest* also contains the famous star catalogue, which is apparently based upon Babylonian sources amassed and applied by Hipparchus. It records forty-eight constellations that are the primary source for our present system of constellations. However unlike today's modern system, these constellations only cover the whole sky at the time of Hipparchus based upon what he could visually see. The *Almagest* remained perhaps the longest running work in history to be considered the authority on any subject. It was used into the Middle Ages as the authoritative text on astronomy.

The *Almagest* was preserved, like most of Classical Greek science, in Arabic manuscripts. Ptolemy's astrological treatise was a work published in four parts and is known by the Greek term *Tetrabiblos*, or in Latin *Quadripartitum* meaning the *"Four Books*" while his original title is lost to the sands of time. However, some Greek manuscripts refer to it as *Apotelesmatika* or approximately meaning *"Astrological Outcomes".* Nonetheless, Ptolemy advanced many arguments for the spherical shape of the Earth. Chief among them was the observation that when sailing towards mountains, they seem to rise from the sea, indicating that they were hidden by the curved surface of the sea. He also gives separate arguments that the Earth is curved north-south and east-west.

Claudius Ptolemy (90–168 AD), A printed map from the 15th century depicting Ptolemy's description of the Ecumene (1482, Johannes Schnitzer, engraver)

Ptolemy produced an eight-volume geography dealing with the Earth or the inhabited world known as *Oikoumenè*. Ptolemy's work spanned 180 degrees of longitude from the Canary Islands in the Atlantic Ocean to China, and about 81 degrees of latitude from the Arctic to the East Indies and deep into Africa. Ptolemy was well aware that he knew about only a quarter of the globe. The first part of the work *Geographia* is a discussion of the data and of the methods he used. Ptolemy put all this information into a grand scheme and assigned coordinates to all the places and geographic features that he knew about at that time. He created the grid spanning the globe and basic system of longitude and latitude that we still use today, though most of this grid system has been lost. Ptolemy measured latitude from the equator, as it is today, but he preferred to express it as the length of the longest day rather than degrees of arc. He put the meridian of 0 longitude at the most western land he knew, the Canary Islands. What is clear is that Ptolemy included China then known as *"Serica"* or *"Sinae"* at the extreme right beyond the island of *"Taprobane"*, known today as Sri Lanka, albeit oversized. The Southeast Asian peninsula is also represented known then as the "*Aurea Chersonesus*".

This flat Earth model was of course theological and emerged from doubt implied in the Hebrew Bible, which inspired some early Christian scholars such as **Lactantius** (240–320AD), **John**

Chrysostom (347–407AD) and **Athanasius of Alexandria** (296/298–373AD). However, this strange flat model remained the eccentric learned view of many Christian authors. Though there were some Christian authors who clearly were aware that the Earth was round not flat, such as **Basil of Caesarea** (329/330–379AD), **Aurelius Ambrosius of Milan** (333/340-397AD), and **Augustine of Hippo** (354–430AD). Nevertheless, the flat earth view was dominant in Syriac or Syrian Christianity, among the Syriac-speaking Christians of Mesopotamia. This Eastern Christianity tradition then rested greater importance on a literalist interpretation of the Old Testament, which still dominate some modern Christian sects today. Authors from this tradition, such as **Cosmas Indicopleustes** (6th century AD), presented the Earth as being flat as late as in the 6th century AD, constituting the last remnant of the ancient model of the cosmos that did not vanish until the 7th century. From the 8th century onward, everyone agreed that the Earth was by no means flat. Nonetheless, this concept of a literalist interpretation of the Hebrew Bible precludes the idea that the Earth is older than generally 6,000 years.

In other parts of the ancient world including India, there had also been the longstanding belief that the world was flat. With the rise of Greek culture in the east, Hellenistic astronomy began to filter eastwards into ancient India. By the early centuries AD the Greek idea of a spherical earth surrounded by spheres of planets, now fervently supported Indian astronomers such as **Varahamihira** (505–587AD) and **Brahmagupta** (598–668AD). This helped to broaden the dated Indian cosmological belief in a flat disk-like Earth. Earlier work by the classical Indian astronomer, **Aryabhata** (476–550 AD), had argued for the spherical form of the Earth and the motion of the planets. He further argued that the circumference of the Earth was 4,967 *yojanas*, or about 39,968 km nearly the calculation of Eratosthenes during the 3rd century BC.

Oddly, it took until the 17th century for the idea of a spherical earth to be accepted in China. Western Astronomy ultimately spread to Ming China only when Jesuit missionaries, who held high positions as astronomers at the imperial court, successfully challenged the Chinese belief that the earth was flat and square.

As bizarre as it may seem, the Maya also believed that the Earth was flat like a horizontal plane. This was even true with all their precise measurements observing the heavens. They presumed everything revolved around the flat and fixed entity of the Earth. This flat plane, however,

amazingly had four corners with each represented by a color. East was red, symbolizing the rebirth of the sun. West was black, the place for the sun's death. White represented north and yellow was south. The configuration to them was almost like a house holding up a roof that revolved.

At the center of the Earth, there stood a fifth vertical structural coordinate. Its color was blue-green. At the center of this flat strange world stood a giant Ceiba tree, also holding up the sky, uniting the Mayan universe. Its roots reached deep down to the underworld of the dead and its trunk stretched high up into heaven, where the gods lived. For the Mayan who died a noble death such as sacrifice, in battle or childbirth the soul would travel to heaven. For the Mayan who lived in greed and sin his punishment was an eternity of suffering in the *Xilbalba*, the underworld, or hell as we know it. For those who died but fit into neither group they wandered and paid penance with the hope of eventual admittance to heaven or the concept of Purgatory. The central Ceiba tree connected these worlds.

The mountains and caves on Earth were typically seen as the transition points between the physical and the spiritual worlds. As the Yucatán was virtually flat the pyramids were seen as manmade mountains – the absolute center of power. A temple doorway represented a cave leading into the center of that mountain and into the underworld, as many royal Mayans were buried inside the pyramids.

Some Maya sects believed that the sky was multi-layered and that it was supported at the corners by four gods of immense physical strength called *Bacabs,* similar to Atlas for the Greeks. Other Maya believed that the sky was supported by four trees of different colors and species with the green Ceiba, or silk-cotton tree, at the center connecting Heaven and Hell.

Therefore, the Maya did not possess a true knowledge of the structure of the universe and how the earth fit within this grand scheme. They could observe the stars and determine **TIME**, but this idea that the earth moved toward a black hole at the center of the Milky Way is not truly within the understanding of the Maya.

Chapter V

The Great Mental Divide

Between East & West

Dresden Mayan Codex

The thinking process of modern man is not the same in all cultures. Fundamentally the two primary processes are linear and nonlinear. The West developed the former where we proceed through life following in a straight line that we believe connects cause and effect. Like many Eastern philosophies the Maya thought in a nonlinear process where there is no single cause and effect but dynamic force of multiple consequences. From a religious perspective their basic ideas are not that foreign. Like the Egyptians the ancient Maya pictured a luxurious afterlife a heaven, and a place of the underworld we call hell. We find this concept throughout many cultures to be fairly common. Few religions over the span of time have adopted a perspective that this is all there is; birth, life, death, and oblivion. Most popularized is the Egyptians remarkable take on the

afterlife, with the mummifying of their dead, in belief of the body and spirits resurrection. They believed that when the spirit returned on resurrection day it could find the body, or even an image of the body, and become reincarnated.

The thinking process here is vital to realize for it will lead to understanding. It has nothing to do with ADOPTING their beliefs but simply being able to observe objectively their life directing faith. **Richard E. Nesbett** (1941-) wrote a good book entitled, *The Geography of Thought, How Asians and Westerners Think Differently ... and why*. He attributed his work to a Chinese student who said to him, "You know, the difference between you and me is that I think the world is a Circle, and you think it's a line."

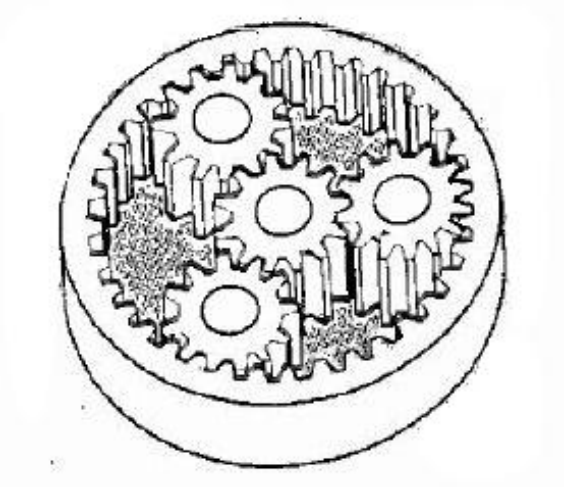
He goes on to quote him:

> *"The Chinese believe in constant change, but with things always moving back to some prior state. They pay attention to wide range of events; they search for relationships between things; and they think you can't understand the part without understanding the whole. Westerners live in a simpler, more deterministic world; they focus on salient objects or people instead of the larger picture; and they think they can control events because they know the rules that govern the behavior of objects."*

Nisbett was indeed correct. Asian culture has instinctively understood the cyclical movement of TIME. In Western culture, we tend to think linearly, not dynamically. When we look at events, we try to reduce them to a single cause and effect. This thinking produces confusion when things do not follow that chosen path and false beliefs arise by not recognizing the world is a far more complex place. Things are never a single cause and effect. There is a hidden order behind everything that is far more complex than meets the Western eye.

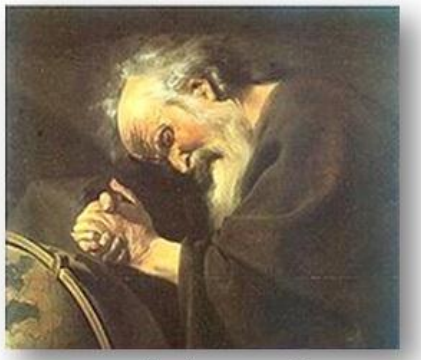
Think of the rain forest balancing on an interdependent and cyclical system. If you destroy a single species, you disrupt this chain of imminent events, that species was a predator of something be it plant or animal. Remove it, and whatever it kept in check now grows crowding out other competitors. Likewise, that species might be the prey of another and now its food source is destroyed. In this manner, things are far, far, more complex than we might imagine. If a stock market crashes government predictably looks for the culprit to hang. However, the 1929 Great Depression became much worse with the *Sovereign Debt Crisis* that began on May 8th, 1931. The Austrian bank *Credit Anstalt*, which was a respected bank founded by the famed Rothschilds in 1855, had to report a $20 million loss on its 1930 accounts. That started the bank runs and collapse of government debt. Yet, Congress cannot hang a foreign bank. They need someone to persecute thus targeting domestic citizens and heap the blame upon them to show the public they are doing something even when it amounts to nothing. They begin with the presumption that some short player overpowered the market and forced it down. They have

never once found this mythical short player but it fits the limited scope of objective thinking while ignoring the complexity of a far more interesting dynamic world.



Picture the world instead of a single dimensional object as an interconnected set of gears. You cannot turn one without affecting all others. In reality this is the dynamic world in which we live. This is the world in which the Mayan discovery of TIME took place, about 2,000 years ago. To see what the Maya discovered and to understand what 2012 truly means, we must abandon our one dimensional world and set ourselves free from the shackles of our linear tunnel vision. Once we realize that everything is a vibrant pulsating world where the movement of nature and the universe is cyclical, we will begin to see that life has its ups and downs. The seasons come and go only to return again. “What goes around comes around” as they say. Welcome to the dynamic world of the Maya where everything exists in a diverse dynamic perspective.

In the case of the Maya, they believed that in creating the world the gods had shed their own blood. Therefore sacrifice, from the Mayan people’s perspective, was a required service to return the favor back to the gods for creating all that sustained their lives. Even the kings would cut their penis to draw blood as a sacrifice - bizarre behavior from our modern prospective. Could you picture the President of the United States doing such a thing?



Heraclitus (c 535-476BC)

The Maya observed the world and saw that everything around them moved. This is the root observation that brought them to the study of cycles and time. In the West, there was **Heraclitus of Ephesus** (Ἡράκλειτος ὁ Ἐφέσιος) (c 535-476BC) known as the "Weeping Philosopher" famous for his realization that everything in the universe was subject to change,

"You cannot step twice into the same stream*".* Indeed, he also came to express his philosophy of observation "Nothing endures but change!" as everything is constantly in a state of flux. Clearly, the ideas of the Maya were not entirely unique. Like the cultures of the East they indeed grasped this world of constant change, which led them to mapping the changes around them and seemingly forecasting **TIME**. Bringing us to why we are still talking about them today. Their thinking process became dynamic and a natural state of being. Rather than the linear state adopted by the West. In the European world those who thought dynamically and saw many things in a state of flux tended to be called either a genius, such as **Albert Einstein** (1879-1955) or **John Law** (1671-1729) who actually gave us the laws of supply and demand that other's plagiarized.

The observation of the existence of cycles extends as far back to the Stone Age. Observing the cyclical movements within the heavens above them was just the beginning of a blaringly obvious trend. As man was confronted by the cycles within nature, that included the four seasons, he was enabled to begin to understand the migration of animals and when to plant crops. Comprehending the natural inherent cycles within nature was essential to the growth and evolution and supremely the survival of mankind.

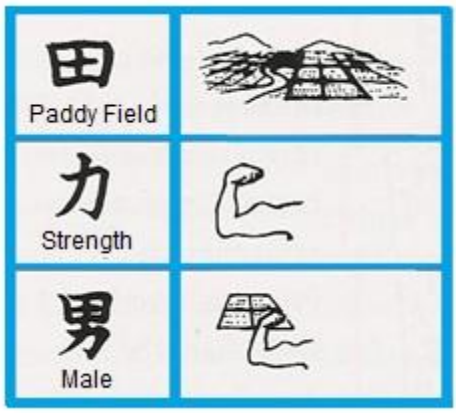
Somewhere along the way, there was a great mental divide between East and West that is self-evident even within the development of written language. The East developed a pictorial language where individual words became a graphic representation contrasted with the development of an alphabet based upon phonetic sound. These two distinct methods of language appear to have a marked difference in the thinking process of man.

English – Greek – Japanese – Mayan

Man - άνθρωπος - 男 – 

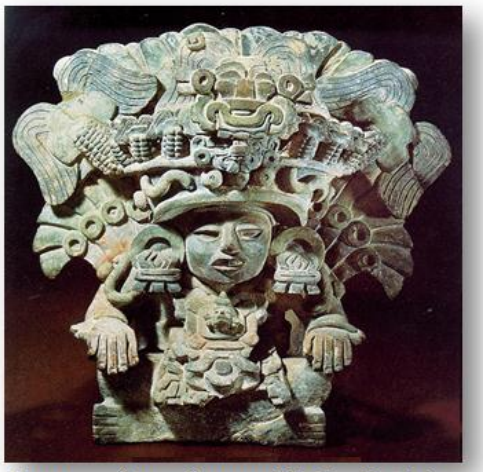
If we research back to find where the line separating the two strikingly different ways of thinking can be drawn, we more or less arrive at the Bosporus where Greece and Turkey are separated. This is generally veiwed as where Europe and Asia meet. In Europe the dominant language became Latin, which is no longer a spoken language except in some religious ceremonies, yet most languages are derivatives thereof. The Greeks are all that survive of the ancient world, whereas the Sumerians, Babylonians and Egyptians, all faded into history. In the west there is a difference between a script used for writing and the spoken language. Whereas languages have vanished into history, the scripts often survive, merely being adapted by different languages. An example of this is the spoken language of Asia Minor faded while the cuneiform survived simply being altered and adapted. This is the reason that Greek and Chinese language has survived through the ages.

The evolution of pictorial scripts can be illustrated by the Japanese *kanji* character for "male". This is the combination of working in a paddy field where traditionally only men worked in ancient days and the symbol for strength. Thus, the merger of the two characters for paddy field and strength implicitly became the symbol for a male. Once you understand the construction of the characters, you begin to see the logic behind the cultures thinking process. Everything is position and relationship. For example, the ancient capital of Japan was Kyoto. This was moved to a city to the east and became known as Tokyo. Translating this we come to *to* meaning east and *kyo* meaning capital. Therefore, *Tokyo* literally meant city "east" of the ancient "capital". Streets in Tokyo are only named after emperors, no one else was deemed worthy, so few streets are actually named in comparison to Europe cities.



The Egyptian and Mayan hieroglyphs are long gone scripts and languages today, but they share this pictorial language structure parallel to the Chinese and the Greeks. The alphabetic line can be drawn with the Egyptians that bordered the Western culture. This distinction in language coincides with a difference in the thinking process contrasted by the distinction between linear and a dynamic view of the surrounding world.

The oldest Mayan script dates to the 3rd century AD. These scripts had to have been adopted from previous pictorial writings of other cultures as it is far too complicated to have simply emerged from nothing. We find two examples of ancient script, Zapotec and Isthmian, which both pre-date the Maya. The Zapotec civilization was an indigenous pre-Columbian civilization that flourished in the Valley of Oaxaca of southern Mesoamerica dating back 2,500 years. Archeological evidence has been found dating the Zapotec civilizations origination to the late 6th Century BC. These people left plentiful archaeological evidence in their ancient city of Monte Albán in the form of buildings, ball courts, magnificent tombs and grave goods including finely worked gold jewelry. Monte Albán was one of the first major cities in Mesoamerica and the center of a Zapotec state that dominated much of what is now the Mexican state of Oaxaca. We find the same basic structure of these people's culture reflected

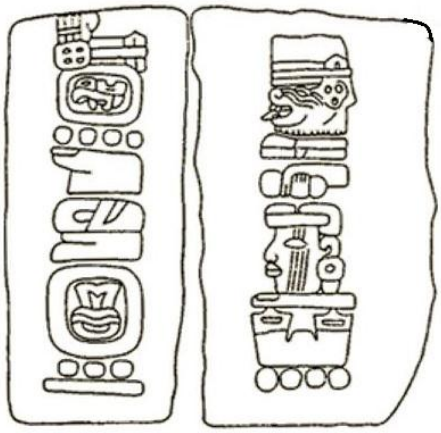


Zapotec figural urn with Cocijo deity
Monte Alban, III, circa 200-400AD

within the Maya, right down to their ball courts and similar art styles. This strongly suggests the Mayan cultures origination and materialization from the collapse of the Zapotec.

The Zapotec writing system is certainly perhaps the earliest writing system in Mesoamerica. It was first dated to 500–600 BC, although this dating remains of course debated. Nevertheless, the Zapotec writing system is still regarded as the earliest writing in Mesoamerica. It is read in columns from top to bottom like the Mayan writings, but its execution is somewhat cruder compared to the later Classic Maya and it appears to be less phonetic in structure than the largely syllabic Mayan script. The Zapotec script went out of use only in the late Classical period.

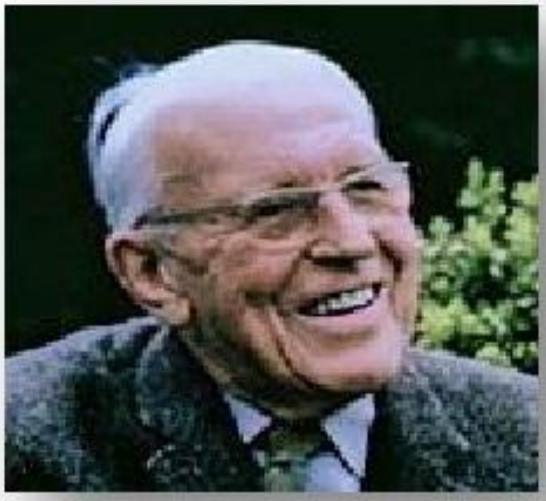
Zapotec Writing - Monte Alban



Stelae 12 *Stelae 13*

The nemeses of the Zapotec were the warlike Aztecs. The last battle between them took place circa 1497 - 1502, when the Aztec ruler Ahuizotl (1486-1502) was in power. At the time of Spanish conquest of Mexico, news arrived that the Aztecs had been defeated by the Spaniards. The Zapotec King Cosijoeza (1487–1529) ordered his people not to confront the Spaniards so they would avoid the same fate. Nonetheless, they were defeated by the Spaniards only after several campaigns between 1522 and 1527. However, uprisings against colonial authorities occurred on numerous occasions in 1550, 1560 and 1715

Zapotec City



Sir Eric SidneyThompson
(1898–1975)

At first, the Maya were portrayed as a utopian society that was superior to the West. The writing that appears in the *Dresden Codex* bears no resemblance to Sumerian cuneiform, the Greek Linear B script or even Egyptian hieroglyphs. They appear to be more akin to cabalistic symbols used in some religious esoteric cult. This is how they were viewed by most scholars until the 1950s & 60s. **Sir Eric Sidney Thompson** (1898–1975), was a leading Mayan scholar, who asserted in 1972 that, *"Maya writing is not syllabic or alphabetic in part or in whole".* Through Thompson's eyes the Maya were thought to be a theocracy, ***Time Worshippers***, with an immensely sophisticated calendar and a deeply spiritual outlook. Their motto being "*live and let live*" and their character was supposed to be one of patience, and consideration for others. The Maya became a civilization unlike any other, argued Thompson, who looked upon the Maya as a source of spiritual values in a modern world that placed far more importance on material prosperity.

Thompson was, by his own admission, a *generalist* in the archeology covering every aspect of his subject rather than specializing. He conducted a number of excavations in **Belize** and was one of the first in the field to investigate smaller sites on the peripheral away from the elite main ceremonial centers. It was this work that crowned him with a superior know of the Maya common people. Thompson's decipherments of Mayan launguage were predicated on an ideographic approach rather than based upon purely linguistic principles that would take a phonetic approach. He insisted that the Mayan glyphs did not incorporate a **phonetic** component. Only after Thompson's death, did it surface that his academic status blocked any others possibly fruitful approach to deciphering the glyphs.

Thomas More (1477-1535)

Thompson was biased and he committed the fatal mistake in research of looking for something he wanted to find. In other words, you filter the results to fit a predetermined conclusion rather than allowing the investigation to lead toward a new understanding. In many respects, Thompson was influenced by the Marxist vision of *Utopia*, not from a political sense, but from the inspiration of creating a perfect world. This idea of a perfect world emanates from **Thomas More's** (1477- 1535) book entitled *"Utopia"* creating a fictional world.

More's Utopia became known as the "golden little book". Moore entitled the work "Utopia" taken from the Greek ***ou-topos*** meaning "no place" that was a pun on ***eu-topos*** meaning in Greek a "good place". More created a world that did not exist. It was a pagan communist city-state where the policies of the state were all based upon reason. This was a fictional world that would eradicate human nature of self-interest in an effort to eliminate greed for power and wealth. It was within this spirit that Thompson celebrated the ancient Maya and distanced them from the reality of brutality, blood rituals, and human sacrificing that indeed did exist in their culture. This idea of the perfect world spoke and in hand influenced Thompson who tried to convert the Maya into his idea of the ideal society that he wanted the West to imitate.

Sir Arthur John Evans (1851–1941)

In all fairness, this manipulation of history was not a unique flaw confined to only Thompson. **Sir Arthur Evans** (1851-1941) did the same regarding the Minoans, distancing them from the crude bloodthirsty Mycenaean Greeks, and creating the idea of the perfect world. Evans, like Thompson, sought to create fictional role models from the past to show that society could be better. This same dream is what led Karl Marx (1818-1883) to adopt the idea of Communism to eliminate wealth that he believed led man to injustice through the pursuit of wealth.

Minoan Palace at Knossos - upper Throne Room
Frescoe of Minoan Muses Circa 1700 - 1380 BC

The Minoan civilization was of the Bronze Age burgeoning on the island of Crete and flourished from approximately the 2700 to 1450 BC. Their trading range and colonization extended to Spain, Egypt, Israel (Canaan), Syria (Levantine), Greece, Rhodes, and of course to Turkey (Anatolia). Recent DNA investigations have revealed that even the Etruscans of Italy, for whom Tuscany takes its name, show that they are linked to the Minoans and Lydia in modern Turkey according to Professor Piazza. Likewise, the Minoans may have been influenced by Egypt and maintained diplomatic ties with them, but their DNA shows they are of the Anatolia Greek origin. This does explain the very advanced ancient civilization of the Etruscans from who the Romans had to gain their freedom.

Minoan Copper Ingot

It is clear that the Minoans were the grand empire that the Mycenaean Greeks looked up to and eventually conquered. Many other cultures referred to the Minoans as *"the people from the islands in the middle of the sea"*. In fact the Minoans had created an international economy built upon trade. They had not developed coins but dealt in copper ingots. One interesting aspect of this cultures monetary system was that Crete had no metal deposits of its own. Yet, the maritime superpower traded far and wide that included the tin trade with Britain allowing the Bronze Age to begin.

Knowledge of the spoken and written language of the Minoans is scant, due to the small number of records found. Around 3,000 clay tablets have been found with various Cretan scripts on them. Clay tablets seem to have been in use from around 3000 BC until probably earlier. Two clay cups from Knossos have been found to have remnants of ink and inkwells, similar to the animal shaped inkstands from Mesopotamia, have also been found. The Minoan

language is occasionally referred to as Eteocretan. This presents confusion between the language written in Linear A scripts and the language written in an Eteocretan derived alphabet after the Greek Dark Ages. There is not enough source material collected on either language to permit inferences to be made about whether Eteocretan language is a successor of Minoan.

A fresco found at the Minoan site of Knossos
Showing sport or ritual of "bull leaping"
Red skinned man figure leaping with two light skinned women

The earliest dated writing found on Crete are Cretan hieroglyphs. It is not known if this language can be defined as Minoan and scholars often debate it's origins. These hieroglyphs show relation to several other writings from the region of Mesopotamia but are often associated with the Egyptians. The hieroglyphs came into use from the Minoan Protopalatial Period (MMI) and were in parallel used with the emerging Linear A from the 18th century BC (MM II) and disappeared at some point during the 17th century BC (MM III).

It was the Mycenean period, where Linear A was replaced by Linear B, recording a very archaic version of the Greek language. The overwhelming majority of tablets are written in the Linear B script, apparently being inventories of goods or resources as well as inscriptions of religious cult objects. Because most of these inscriptions are concise economic records rather than dedicatory inscriptions, the translation of Minoan remains a challenge. Linear B was successfully deciphered by Michael Ventris (1922-1956) in 1952, but the earlier scripts are still a mystery. Unless Eteocretan truly is its descendant, it is perhaps during the Greek Dark Ages, a time of *economic and socio-political collapse, that the Minoan language became extinct.*

The Minoan civilization was destroyed by a natural event, the eruption of a volcano on the island of Thera, known today as the island Santorini. This eruption was certainly among the largest volcanic explosions in the recorded history of mankind. Due to the topography of the island and to the Minoans as a sea power making them dependant on their naval and merchant ships. One would deduce this eruption most likely wiped out their fleets, thus their livlihoods and in hand destroying their economy. There has been debate whether these organic effects really were enough to trigger the downfall of the 1,250 year old Minoan civilization. Nevertheless, it was after the Thera eruption that we find the barbaric military state of Mycenae rushes in and conquers the Minoans in their weakened circumstance. It appears that the Thera eruption wiped out much of their economy opening the door to the invasion of the Mycenae of Agamemnon fame and the invasion of Troy. This is much as the fall of Rome where

the barbarians swept in thanks to the fiscal mismanagement of the enstated government. Both Evans and Thompson wanted to find the perfect societies where liberty and justice for all really did exist. The glorification of the Minoans was exposed after Evans' death in 1941, as Evans' academic stature no longer intimidated rivals, enabling the revelation that what had been written in the Linear B tablets depicted anything but a perfect docile society.

Heinrich Schliemann
(1822–1890)

Another group whom seek to fit history to support their agenda are environmentalists. They argue that the Minoans demise was through practice of deforestation and them meeting their environments maximal load or *carrying capacity*. They argue that the Maya also depleted their resources in ways such as soil exhaustion because of their intensive agricultural needs to sustain their population. **Heinrich Schliemann** (1822-1890), who discovered Troy and Mycenae, had no such *utopian* dreams. He merely followed Homer to prove it was history.

As was case following Evans' death, after Thompson's death in 1975, the truth about the Maya began to emerge showing anything but a utopian peaceable civilization. In actuality the core of this culture was centered on human sacrifice, which they believed was necessary for the continued success of the peoples' agriculture, trade, and overall health. The Maya had ritualistic ball games called *Pok-A-Tok* played on scared open air ball courts. One of the greatest archeological Mayan ruins is the ball court of *Chichén Itzá*, 545 feet long and 225 feet wide, and could hold thousands of spectators, proving the Mayans architectural sophistication. Legend depicts, after a match the winning captain presented his head to the losing captain, who then decapitates the winner. Believing this brutality to be the ultimate honor allowing the decapitated captain to go straight to heaven and not having to complete the 13 steps that they believed they had to go through in order to reach this place. As a society of fiercely competitive city states the Maya centered their culture on conquest, detainment and torture of the rival city-states rulers. They tormented and humiliated these captives for sport and included these prisoners in their ritualistic ball games where the prisoner assumed the role of a *gladiator* and was decapitated after a staged match. These games went on 500 years before the Olympics!

We see the image of the Maya has thus changed over time thanks to various cultural and academic biases. Once the desire to find the perfect civilization was put aside, the real Mayan civilization emerged. The key gem of Mayan culture remained their written glyph language

Fray Diego de Landa (1524–1579)

which during the early 20th century was still shrouded by myth. As the veil was removed we began to see what made the ancient Maya really tick.

The written language (script) of the Mayan glyphs could be alphabetic, phonetic, or perhaps a mixture of both. Consequently what we know today of their alphabet and writings was from a vicious oppressor of the Maya, Spanish inquisitor **Fray Diego de Landa** (1524–1579). A Franciscan Friar in charge of bringing the Roman Catholic religion to the Mayan people of the Yucatan. Landa wrote the "*Relacion de las Casas de Yucatan"* (An Account of the Things of Yucatan) in which he catalogues the Mayan culture, religion and language that included thier writing system. As velehment as Landa and the other missionaries where about converting the Maya it is obvious how little they really understood these people. The Spanish named the country *Yucatan* based upon the response in Mayan to the question *"what is the name of your land",* the Mayan responded, "*uic athan*". Ironically we now understand that the Mayan response was misunderstood and actually means, *"what do you say, we do not understand you".* Landa clearly made the assumption that the Maya were like Spaniards and used an alphabet and assumed that all languages are the same in structure. This presumption about the Maya was incorrect. Nevertheless, the phonetic sounds that he recorded have proven the lone source of what we know today of Mayan language.

In 1562, after learning converted Christian Maya where continuing to practice idol worship, Landa ordered the infamous *Inquisition in Mani* ending with a destructive ceremony called *auto-da-fé*. During the ceremony forty Maya codices and some 20,000 Mayan cult images were burned as well as ruthless oppressive acts forced apon the Mayan people. This inhumanity was highly criticized even by other Franciscan Friars as being unprincipled and attracted considerable negative attention from authorities both secular and ecclesiastical. This event as well as the sheer violence of Landa's inquisition made many Maya flee into the forests to escape his monomaniacal tyranny. After this backlash Landa was compelled to return to Spain to defend himself against accusations of the excessive violence in the conversion of the Maya and his usurpation of authority. Consequently, a "committee of doctors" was formed being commissioned to investigate Landa's alleged crimes and his actions were stalwartly condemned

before the Council of the Indies. Landa defended himself claiming he had discovered evidence of human sacrifice and other idolatrous practices while rooting out native idolatry-

> *"We found a large number of books in these characters and, as they contained nothing in which were not to be seen as superstition and lies of the devil, we burned them all, which they (the Maya) regretted to an amazing degree, and which caused them much affliction."*

When investigated one of his alleged human sacrifices was found to be alive but Landa insisted the Papal Bull *Exponi nobis* had justified his actions.

Landa's manuscript of Mayan language was written around 1566 on this return to Spain. Landa wrote this work as an exculpation against the charges levied against him for his extreme brutality against the Mayan people. It is here that we find the Mayan alphabet that has proved to be the key to deciphering Mayan glyphs today. Their alphabet is incredibly complex, containing numerous sounds for some letters, and syllabic signs. As well as detailing the Mayan language, Landa's "*Relación De Las Cosas De Yucatán"***,** is ironically a fairly complete account of Mayan religion. While some of his religious accounts are most likely exaggerated, to justify his own actions, his core account is notably accurate based upon other fields that appear to be reliable. His account of Maya social organization, as well as the various geographical structure of the towns and cities prior to the conquest, have proven to be invaluable. Paradoxically, the man who destroyed a civilization preserved it by documenting what would have been lost over time otherwise. In turn Landa's writings are our main contemporary source for Mayan history.

In 1569 the committee absolved Landa of his crimes and his supporter, **Bishop de Toral** (1502–1571), died in 1571 thus appointing Landa in his place in 1573. Landa's exoneration only encouraged his continued campaigns of extirpation of idolatry and oppression of the Maya. He continued to be criticized by secular authorities who found his methods inhuman. This caused long conflict between the ecclesiastical judiciary system of de Landa and the Governors of Yucatán. This narrow minded man effectively set out to destroy a culture. The Franciscan order eventually removed the right to take disciplinary measures against idolaters as a consequence of Landa's violent actions. Conversely, Landa's fierce effort to exterminate the traditional Maya religion, most likely had the opposite effect. How a man could be so cruel and also claim to worship God and to be carrying out his prophocies remains a mystery. These uncivilized actions are what earned Landa his place in the history of the Christianization of the Americas. He set out to destroyed an entire culture. Fortunetly, today the Maya religion is still alive in the Yucatán.

The Mayan language has no proven genetic ties to other language families though similarities

do exist within some languages of Mesoamerica such as the older Zapotec. Nonetheless, the pictorial structure is distinct from the Western alphabet systems. The Mayan writing is fundamentally *syllabic,* where the word is divided into parts and each part has a designated sound each sound pronounced with careful distinction. Also consisting of a mixture of *pure vowels* or *monophthongs*, from the Greek *mónos* "single" and *phthóngos* "sound". A pure vowel sound is when the articulation at both the beginning and the end is relatively fixed, and does not glide up or down towards a new position of articulation.

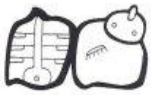
The Mayan alphabet is anything but artless, common or clear-cut especially when deciphered through the writings of a 16th century phonetic translator. We now understand that Landa's interpretation of the Mayan alphabet, though instructive, is also fashioned with misunderstanding. Landa had never encountered a syllabic style writing system, He was clearly confused by this foreign structure. He did perceive that some of the glyphs were syllables and that Mayan consonants could change their meaning depending on whether they were unglottalized or glottalized, In other words, whether the throat was un-constricted or not.

Nonetheless, during the later 19th century, many attempts to do so were made to apply Landa's interpretations. The glyphs representing the Mayan gods and goddesses were identified by comparing artistic renderings of the divinities to a matching glyph. Likewise, various animals were deciphered in the same manner. Leon de Rosny, in 1876, applied Landa's Mayan alphabet and proposed that Mayan writing was a phonetic system, based on syllables. As always, other acedemics tried to resist by creating absurd translations no different than what they did to Schliemann, desperate to discredit the phonetic approach. Thompson, who dominated Maya studies during the middle of this century, rejected Landa's 'alphabet' and phoneticism in Mayan glyphs almost entirely. Thompson argued a logographic explanation of the glyphs.

Page from *Relación de las Cosas de Yucatán*, Landa's Maya alphabet

Yuri Valentinovich Knorosov
(1922-1999)

Only in 1952, was Thompson challenged from Leningrad by a Russian scholar who had never been near Central America. **Yuri Valentinovich Knorosov** (1922-1999) was a young artilleryman in the attack on Berlin in May 1945. During that invasion, he rescued a one-volume edition (published in Guatemala in 1933) of the Dresden, Madrid and Paris codices of the Maya from the burning German National Library. Knorosov was inspired as the book sparked his interest in the complex Mayan writing and from the 1950s thereon he published valuable work on the subject. Because of the political divide, he was unable personally to visit the Maya ruins in Guatemala until 1990 after the fall of Communism in 1989. And it would take well over a quarter of a century after Knorosov's first Maya publication in 1952, before his insights would be generally accepted. We can say that Knorosov has been the primary leader in the decipherments of Mayan glyphs being able to see what others could not. He proposed the first phonetic readings of many glyphs, including the one for dog. Clearly the difference in the phonetic structure of their written language reflects their dynamic nonlinear thinking which distinguishes the Mayan people as they connect everything around them. Knorosov noticed that the first sign in the dog glyph was the same as the second sign in the turkey glyph;



dog glyph

turkey glyph

It is now understood that the native pre-Colombian civilization called the *Zapotecs* had also developed a calendar and a logosyllabic system of writing that used a separate glyph to represent each of the syllables of their language. These people thrived in southern **Mesoamerica** back at least 2,500 years in the Valley of Oaxaca. There writing system shows a thinking process that was indigeonous in this region. This writing system is thought to have been one of the first writing systems of Mesoamerica and the predecessor of the writing

systems adapted by the Maya, Mixtec and Aztec civilizations. At the present time, there is some debate as to whether or not Olmec symbols, dating back to 650 BC, are actually a form of writing preceding the oldest Zapotec writing dated to about 500 BC.

Primitive cultures were clearly enamored with the light show taking place above them in the heavens. In Europe, Stone Age monuments were constructed around the summer and winter Solstices, requiring decades of studying in order to identify the highest point of the sun's declination. In the case of the ancient Maya they turned these observations into a highly developed science and transformed themselves into the "Lords of Time" as some have alleged they even worshiped TIME. It is still not known how the ancient Mayans, being of this Stone Age indigenous society, were able to acquire such exactness in measuring time. Most likely this discovery of the multifaceted movement of the heavens emerged from their steadfast work aligning their various temples with the stars and constellations. This proved to be a very complex undertaking since the Precession of the Equinox is a 25,800 year cycle that moves just one degree every 72 years. What is clear is their calendar is incredibly precise and is 1/10,000 of a day more accurate than the Gregorian calendar we still currently use today. That is amazing in and of itself and stands as a testament to the incredible accomplishment they made in observing every minor aspect of change within the natural world that surrounded them.

Further ancient cultures, like those in Asia, also believed in the cyclical nature of events and time. It is not known if these cultures developed the concept of birth and destruction as a continual cycle from any former source. According to the Maya, we are now living in the *fifth sun* world, which began on August 13th, 3113 BC. Their belief is that there have been four previous "worlds" before the current world that we are currently living in. Each time the four previous worlds were destroyed by natural disasters, with the last being destroyed by a great flood (Noah's Flood). The Maya believe our ancestors are the few surviving descendants of this *fourth sun* world. Like the Maya, Asian beliefs coincide with this view of the "world" we know ending and being a cycle that has taken place more than once. The destruction of the dinosaurs

and Noah's Flood are just two inexplicable examples of a "worlds" completion. However, this does not imply the world will be destroyed. Changed yes – but destroyed no. We see in present media the Mayan philosophy being hijacked and their accomplishments being degraded to nonsense about the end of the world. This bunk will only further discourage modern people from examining their culture and keep them from seeing the contributions they have made to the knowledge of mankind.

In recorded history there have been numerous instances of the apocalyptic extinguishing of humankind or *natural disasters*. Understandably the severity of the disaster depends on the resilience of the affected population. This understanding is reflected in the formulation: *"disasters occur when hazards meet **vulnerability**".* An example of this is one of the most devastating pandemics in **human history**, the Black Death of the 14th century. Peaking in **Europe**, and possibly deriving from the Silk trade routes coming from Asia, it killed 30–60 percent of Europe's population reducing the **world population** from an estimated 450 million to between 350 and 375 million. Another example, the Great Influenza epidemics of the 19th century, derived from a unknown geographic origin spreading even to the **Arctic** and remote Pacific Islands. Between 50 and 130 million died, January 1918 to December 1920, making it one of the deadliest natural disasters in human history. Some 500 million, or 27%, of the world's population were infected. So there will always be problems that are capable of such types of death and destruction. However, that is not what the Mayan calendar embodies.

The Bible likewise confirms events such as these by describing the destruction of the world by Noah's great flood. Shedding light on this cyclical concept as not entirely being foreign to Western thought. Those who use this cyclical view of TIME and draw from the Mayan predictions an "end of the world" scenario are perhaps exaggerating this concept. After all, there is no empirical evidence that such events will even take place in the instant of a day. This concept of birth and renewal is indeed thought provoking and is very much engrained in Asian culture and to a lesser extent in Western as well. However, the key function of those events is the creative destruction that gives birth to a new era. This is much like the symbol of Janus from Rome where one face looks back in time and the other forward. January is names after this Roman god or cycles. This is the contribution of the Mayan; the study of **TIME –** not doom and gloom!

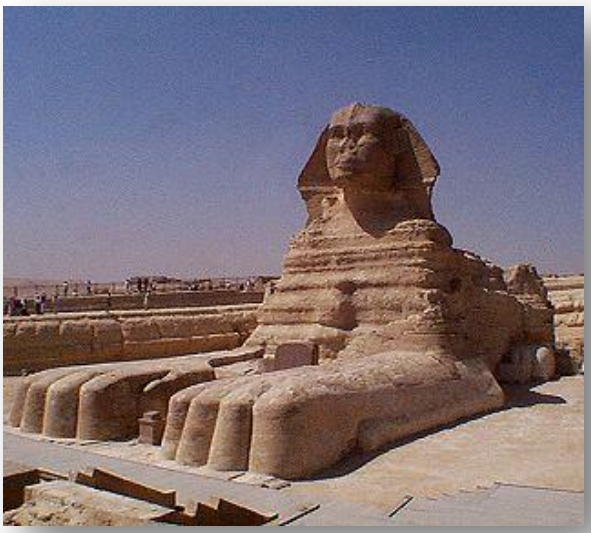
Chapter VI

The Precession of the Equinoxes

The most fascinating aspect of the Maya exploration of **TIME** is how they were able to develop a calendar so remarkably accurate that even by todays standards it is amazingly precise. How did these ancient people achieve this without computers? As described before perhaps the most intriguing accomplishment of the Mayan preoccupation with time is their remarkable discovery of the ***Precession of the Equinoxes***. This is extraordinary because it could not have been discovered solely based upon personal observation. To complete one precession, we are looking at about 25,800 years and that means it takes 72 years to move just one degree in a 360 degree circle. It would take more than an entire lifetime to observe the changes as the heavens moved ever so slowly. The ancient Maya accomplished this feat and by doing so also developing an unsurpassed understanding of time.

Of course the Maya were not the only people over time to discover the ***Precession of the Equinoxes.*** The ancient Babylonians kept meticulous records regarding the movement of everything around them. The origin of these studies began as astrological investigations into celestial observations and terrestrial events. Over time its man's investigation of the heavens that have led to the fundamental understanding of the building blocks of our Earth.

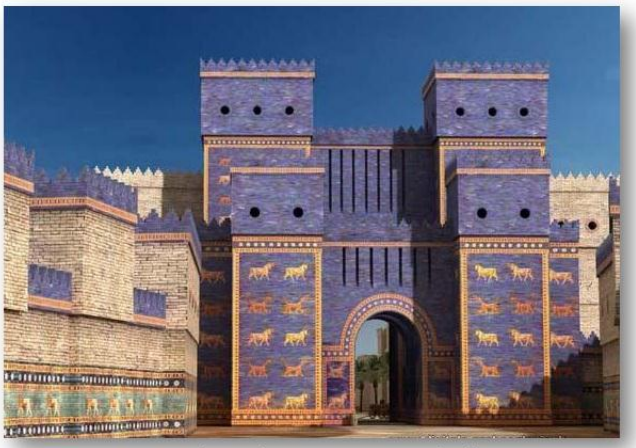
This ancient study of the heavens sought to keep track of everything from the migration of birds to the ebb and flow of the tides. What we refer to as astrology today began as a correlation study from which was also born the development of astronomy. Astrology in the broadest sense has been the search for meaning – signs from the universe as to what the future will hold. It began as soon as man began to try to figure out where he was, why he was there and what would happen next. Lacking newspapers and television, ancient man watched what went on around him on Earth trying to link cause and effect. This was actually the first step in establishing civilization for it enabled man to begin to understand migrations and cultivate crops thus understanding the seasons. It began with the quest to predict seasonal changes by referencing astronomical cycles. Which evolved into a study of the heavens, so ancient man could evolve from a foraging, hunter gatherer.



Man's earliest steps toward creating civilization appear in the markings left behind in cave walls and on bones plotting the lunar cycles. Such discoveries date back as early as 25,000 years ago and illustrate that the first step was recording the Moon's influence upon nature including the biological cycle of women. The observations regarding the constellations, whose appearances change with the seasons, was a step forward in grasping an understanding of the surrounding that allowed agriculture to emerge. The appearance of a particular star-group would herald the annual changes in weather that would produce seasonal cycles, but also floods in some regions. By the third millennium BC, widespread civilizations had developed cultured expertise in dealing with the celestial cycles. It was, at this time that we begin to see temples being constructed to create alignment with the heliacal risings of the stars. It has been suggested that the three bright stars in a row, known as Orion's belt stars, are associated with the Egyptian Giza pyramids, and that the side profile of the Sphinx purportedly appears to be identical to the stars of Leo. The latter was predominantly

inspired by the Sphinx alignment with the equinoctial rising of the Sun with the star formation of Leo at an ancient epoch. It was this tendency among the ancients to align their temples with the stars that also most likely enabled the Maya to discover that the heavens were moving. Hence, by aligning temples with particular stars, they happened upon the ***Precession of the Equinoxes.***

The oldest known astrological references are copies of texts made during this very early period of civilization. Astrology was commonly accepted in political and cultural circles. Some of its aspects also fueled the development of alchemy, meteorology and facets of medicine. The ancients utilized astrology as an integrated system of knowledge attributed to records emerging from the first dynasty of Mesopotamia (1950-1651 BC). There is also the Venus tablet of *Ammisaduqa of Babylon* circa 1700 BC that has been attributed to the reign of **King Sargon of Akkad** (2334-2279 BC). An additional early recording of astrology is ascribed to the reign of the Sumerian ruler **Gudea of Lagash** (circa 2144-2124 BC) describing how the gods revealed to him in a dream the constellations that would be most favorable for the planned construction of a temple.



The Ishtar Gate in Babylon

Though it is often assumed that early forms of astrology began during the Sumerian period in the 3rd millennium BC, it was in Babylon that we see the first organized system of astrology actually arising during the second millennium BC. All such references to ancient celestial omens are considered sufficient evidence to demonstrate the integrated theory of astrology. The history of scholarly celestial divination is therefore generally reported to begin with late Old Babylonian texts (c. 1800 BC), continuing through the Middle Babylonian and Middle Assyrian periods (c. 1200 BC).

By the 16th century BC the extensive employment of omen-based astrology was established by the compilation of the very first state funded research project in modern history (post-6,000 BC) a comprehensive reference work known as the *Enuma Anu Enlil.* The meaningful translation

"*In the days of Anu and Enlil"* or *"Calculation of the Winds and Skies",* are a series of 70 cuneiform tablets recording centuries of Babylonian observations of celestial phenomena and some 7,000 celestial omens. The bulk of the work is a substantial collection of these omens, estimated to number between 6500 and 7000, which interpret a wide variety of celestial and atmospheric phenomena in terms relevant to the priests whom then determined the will and intention of the gods. These texts also refer to the preceding oral addition which

Enuma Anu Enlil

was not previously documented. This massive state funded project led to the birth of more formal astrology, linking events on earth and traits in people, to the cyclical movement of the heavens. These were the principal source of omens used in the regular astrological reports sent to the Neo-Assyrian kings by his entourage of scholars.

Before the 7th century BC the practitioners' understanding of astronomy was fairly elementary. Babylonian astrology at this point in time was commonplace and focused on the prediction of weather and political matters. By the 4th century, their mathematical methods had progressed enough to calculate future planetary positions with reasonable accuracy.

The Chaldean priests of Babylon's studies of the heavens were advanced to the extent that they could predict the Moon's eclipse of the Sun. Requiring dynamic thought to track the movement of these two celestial bodies. The ancients had embarked upon the discovery of the interconnected heavens and their multifaceted dynamic structure. This complex movement took them out of the single one-dimensional observation and into the world of a far more complex system with many moving parts. Studies of the celestial bodies led the high priests of Egypt to the study of overall motion and were able to predict the rise and fall of the Nile River.

Studying the earth's associations and recording those correlations had of course tremendous benefit on mankind's advancement. Some of these ancient observations we still use to this day. Animals seem to hear or sense rumbling in the earth prior to an earthquake and studies are still being conducted on this topic. It was widely reported by zoo officials that the animals in Washington, D.C., felt the vibrations in advance of the August 2011 earthquake of 5.8 in magnitude. Some of the animals at the Smithsonian's National Zoological Park even shouted alarm calls or ran up trees before the people felt any shaking. The earliest documented case of any unusual animal behavior prior to an earthquake is recorded by the Roman historian **Aelian** in 373 BC. He reported that five days before an earthquake destroyed the city of Helike (once located at the coast of the Corinthian Gulf) various animals, like rats, weasels, snakes,

centipedes and bugs supposedly emerged from the underground and fled from the city. Clearly, we see the ancients were observing correlations trying to figure out signs of the future.

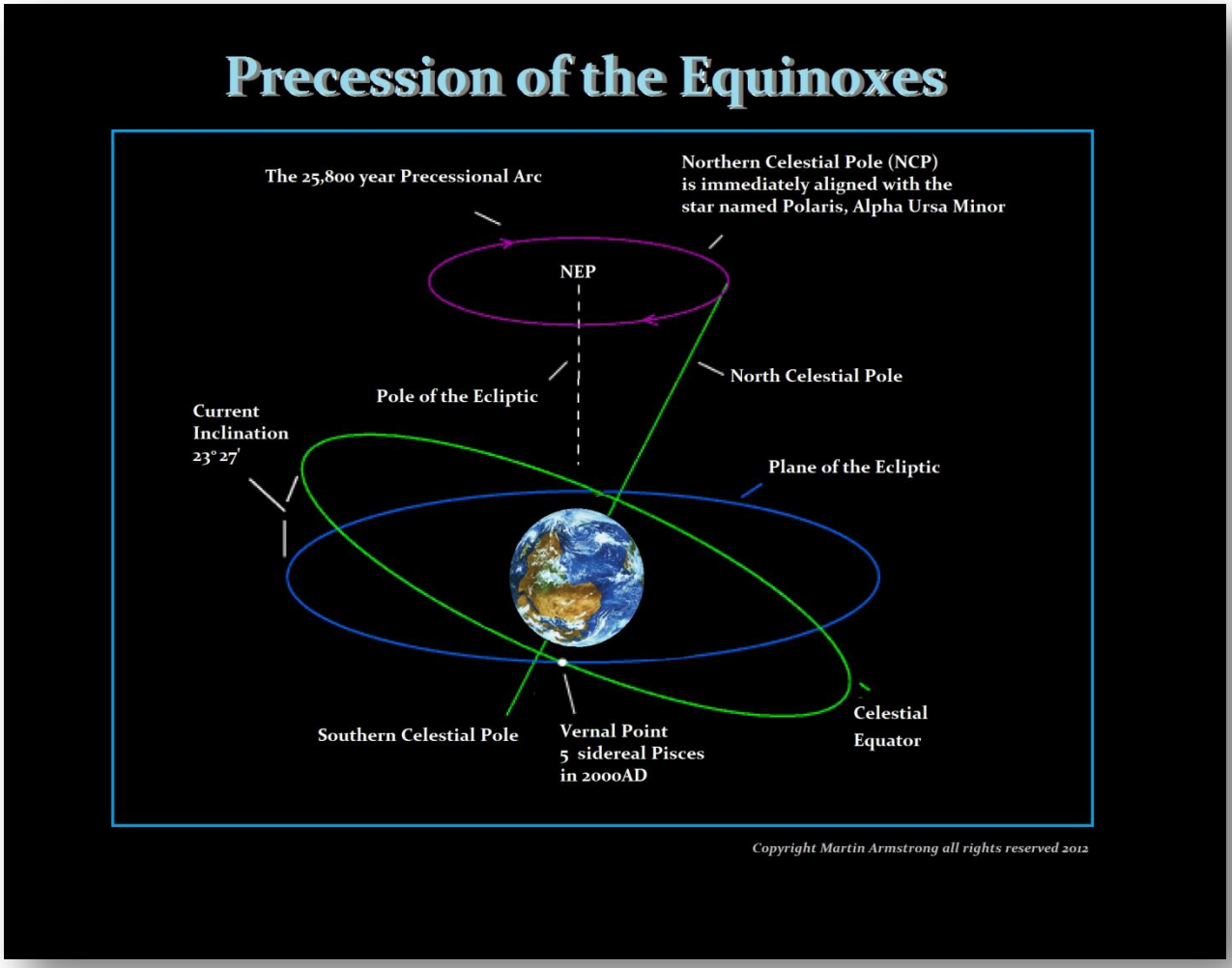
In modern times, the famous Tokyo earthquakes of 1855 and later in 1923, the Japanese reported that their catfish displayed increased activity and hung around the surface of ponds and rivers. This may connect the origin of the ancient Japanese myth that the cause of earthquakes is a giant catfish named *Namazu* who lives buried in the underground.

Chinese authorities also use animals to forewarn of earthquakes as they employ 58 species of animals to be useful for earthquake prediction. They pay close attention especially to snakes, rodents and bats. The government even distributed booklets with depictions and descriptions of unusual animal behavior worthy of note. In February 1975 hibernating snakes abandoned their hideouts in the north-eastern city of Haicheng. The city was evacuated and February 4, the region was hit by a 7.3 magnitude earthquake. While more than 1,000 people were killed, given the densely populated area, the prediction and evacuation was considered a prodigious success.

Legal Code of Ur-Nammu
(circa 2100BC)

We can see why the ancients would catalogue everything that moved and try to decipher the future from those events. There are well over 500 such reports published in volume 8 of the State Archives of Assyria. A majority of these reports list the relevant omens describing recent celestial events. Indeed, many even add brief explanatory comments concerning the interpretation of the omens for the benefit of the king.

The *Legal Code of Ur-Nammu* (*ca.2100BC*) is the oldest known written law code and predates **Hammurabi's** (1792-1750BC) law code by about 300 years. This discovery was determined to be a prototype for the Enuma Anu Enlil and its legal code was deciphered and translated by a Norwegian private collector of manuscripts named **Martin Schøyen** (January 31, 1940). Schøyen holds over 13,000 documents in his exclusive collection and his efforts have contributed greatly to our modern knowledge base despite the academics refusing to acknowledge his efforts because he is private as was the case with Heinrich Julius Schliemann (1822-1890). When the Legal Code of Hammurabi was first discovered in 1901, his laws were heralded as the earliest known examples. Subsequent to that discovery, older collections of legal codes have been unearthed as established by the *Legal Code of Ur-Nammu* (ca. 1900-1700 BC).

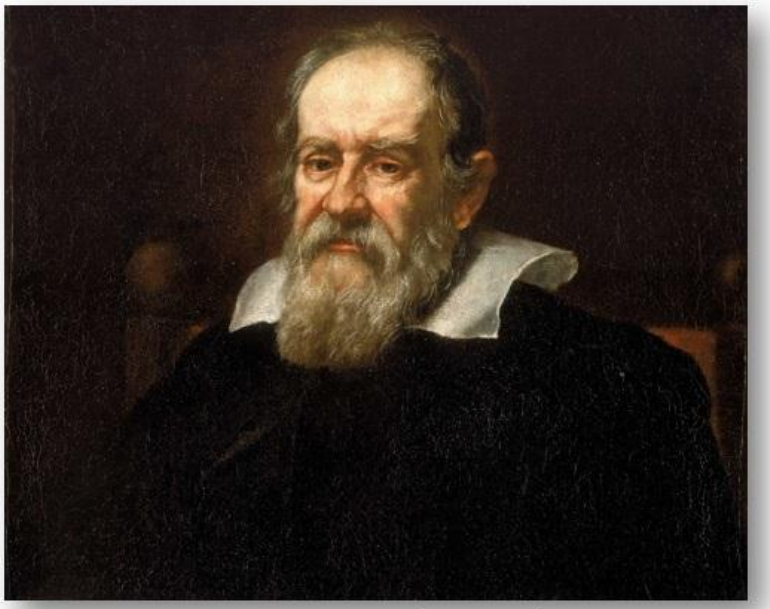


It was this massive Babylonian effort of recording everything that enabled the discovery of the ***Precession of the Equinoxes,*** which some have called the *Platonic Cycle***.** It was the Greek astronomer **Hipparchus** (ππαρχος) (190 BC - 120 BC), who took the Babylonian records of several hundred years prior and began to study what they had collected. He would become known as the greatest ancient astronomer working from 162 to 127 BC. His most reputed achievements include his documented discovery of the Earth's precession, or ***Precession of the Equinoxes*** - the slow westward shift of the equinoxes along the plane of the ecliptic, which results from the precession of the earth's axis of rotation, and causes the equinoxes to occur earlier each sidereal year. One complete precession takes 25,800 years as it requires 72 years for the earth to move just one degree in its 360 degree cycle. This discovery of the ***Precession of the Equinoxes*** thereby emerged by comparing the Babylonian record of the heavens to his contemporary view. His eyes were opened by the changing sky patterns leading him to the same realization that Heraclitus had come to some 350 years before him.

With his solar and lunar theories and his discovery of trigonometry, Hipparchus may have been the first to have developed a reliable method to also predict solar eclipses. He also compiled the first inclusive star catalog or *"star charts"* in the western world and is attributed to inventing the ***astrolabe***, used by astronomers, navigators, and astrologers. The armillary sphere as well, to use in the creation of his star catalogue, which he formally published in 129 BC.

Currently, the North Pole points just about 1^{o} shy of the star Polaris, the immediate most northern pole star, also known as the North Star. The North Pole of our Earth will at last reach alignment with Polaris in 2017. In about 12,000 years from that point, the North Pole will point to a star called Vega. Vega is the second brightest star in the northern celestial hemisphere, after Arcturus. It is a comparatively close star at only 25 light-years from our Earth and, together with Arcturus and Sirius, one of the most luminous stars in our Sun's neighborhood. In most cases the positions of the stars appear to change as the Earth rotates, however when a star is located along the Earth's axis of rotation, it will remain in the same position and thus is called a pole star. Prominent and highly visible from Earth, pole stars lie almost directly overhead.

This is the 25,800 year ***Precession of the Equinoxes*** or the polar shift cycle upon which the Maya based their projected calendar. They were certain that at the turn of the newest world age a very precise celestial configuration would manifest in the heavens. The planets and the stars would determine the very transition points between the successive world ages beginning and end points – cyclical periods in time. Exactly how in fact the Maya discovered this cycle is not entirely understood. And many have speculated that they also aligned their temples with these stars as they moved ever so gradually. It is possible that they were able to determine the ***Precession of the Equinoxes*** by measuring these movements on a grand scale. Perhaps they used the 52 year cycle and thus about 496 of these made up the grand cycle. Using 72 year intervals created 358 of these to establish the grand cycle of 25,800 years. The Mayan use of 52 in their cyclical divination of time is exceptionally fascinating as we will see exploring their calendar in detail.



Galileo Galile (1564-1642)

When astrology was seen as a primitive art and superstition like religion, science lost the one true improvement in thinking and observational skills – the dynamic structure of the universe. In earliest times religion was effectively a state governed creed as evidenced by the trial of Socrates for committing his crime against the gods. Whereas, murder was prosecuted privately by a victim's relatives, for questioning the gods Socrates was prosecuted by the regime. Throughout history ancient observational studies of the heavens brought about human recognition that the earth was round rather than flat further developing the comprehension that the planets revolved around the sun. It was this idea that cost **Galileo Galile** (1564-1642) hisfreedom as he was then imprisoned for life and forced to recant his beliefs that the sun was the center of the solar system rather than the earth. He was given a choice. Recant his work or burned alive for the very same idea as was **Giordano Bruno's** (1548–1600). They stuffed a gag in Bruno's mouth so the crowd would not have to listen to his screams.

Giordano Bruno (1548–1600)

Nevertheless, building upon **Copernicus'** (1473–1543) work, Bruno was perhaps the first person to envision a dynamic universe. His essential theory established the universe with many worlds and suns as we accept as fact today. Unfortunately he had to give his life in the most inhumane manner for this proposition. On February 17th 1600, Bruno was taken to the piazza *Camo de' Fior*, gaged so his screams of pain where not

heard, and burned alive at the stake. Throughout history, and indeed to the people of his time, the importance of Giordano Bruno's writings was established since they were being placed on the “forbidden list” on August 7th, 1603. Even today, governments imprison those they seek to silence. Galileo was keenly aware of what was done to Bruno for his outrageous vision of the universe and chose life imprisonment recanting his work or suffer the most barbaric and inhuman treatment at the hands of those who claimed to be followers of God.

Studying the heavens throughout history has not been done without risk. Far too often, when one’s idea clash with those in power, prison, torture, or death typically awaits them. Indeed, among Indo-European peoples, astrology has been dated to the third millennium BC with roots stemming from calendrical systems used to predict seasonal shifts and to interpret celestial cycles as signs of divine communications. Prior to the 17th century, astrology was considered to be a scholarly tradition. It most likely came into popularity with the idea that the celestial events were signs from the gods. Ancient people often noted comets as being associated with the birth or death of a king. This is why the birth of Christ is associated with the Star of Bethlehem and when Julius Caesar was killed in 44BC, again a comet was noted to have appeared in the sky.

Erastosthenes (273-192BC)

As scholars began determining that the Earth was round **Erastosthenes** (273-192BC), the chief librarian in Alexandria Egypt, understood and calculated its circumference to within 5% of the actual number known today. Though, it was **Posidonius’s** (135-51BC) amiss calculation which was adopted by the famous ancient geographer **Ptolemy** (2nd Century AD). Whom then with this conjecture made the described charts of the world. With the fall of Byzantium in 1453, this knowledge escaped Constantinople (Istanbul) giving rise to the Renaissance in Western Europe. By 1492, relying upon Ptolemy calculations, **Christopher Columbus** (1451-1506) set sail to prove that the world was indeed round. He completed a total of four voyages that led to the European awareness of the **American continents** across the Atlantic Ocean. When Columbus died, he was still convinced that he had reached India based upon the erroneous calculations of Posidonius that had made the world smaller than in actuality. Thus, **Amerigo Vespucci** (1454-1512) is credited with determining the new continent across the Atlantic “America”, which holds his name.

The ancients achieved amazing dynamic concepts of motion through their long and dedicated study of the heavens. As this knowledge began to reemerge during the Renaissance, the concept of motion was also starting to reform in the Western thought process. It was **Rene Descartes** (1596-1650) who challenged the entire presumption that the *absense* of motion was the natural state of all things. **Sir Isaac Newton** (1642-1727) built off of this idea and developed the basic laws of motion.

By the 13th century astrology had become a part of everyday medical practice in Europe. Doctors combined *Galenic* medicine, named after the Greek physiologist **Galen** (129-216AD), with studies of the stars. By the end of the 1500s, physicians across Europe were now required by law to calculate the position of the Moon before carrying out complicated medical procedures, such as surgery or the cessation of bleeding. The understanding of women's menstrual cycles correlating to the moon and the tides in the ocean was also recognized at this time. Another was the idea of the Werewolf or the term "Lunatic" which emerged from the study of the full moon's affect on some people.

Astrological studies in the 13th century became quite influential including those by the British monk **Johannes de Sacrobosco** (1195–1256). Additionally, the Italian astrologer **Guido Bonatti,** from Forlì Italy also became influential (his dates of birth and death are not known). However, through his life time, **Bonatti** served the communal governments of Florence, Siena and Forlì and also advised the Holy Roman Emperor **Frederick II** (1194–1250). His astrological text-book *Liber Astronomiae* (Book of Astronomy) was written about 1277 and was considered to be one of the most important astrological works during the 13th century. **Durante degli Alighieri** (1265–1321), better known as the great Italian poet **Dante**, immortalized **Bonatti** in his *Divine Comedy* by placing him in the eighth Circle of Hell. This was a place he reserved for those who would divine the future. Here their heads would be turned around like the Roman god Janus to compel them to look backwards rather than forward. Unfortunately, the basis of the content in **Dante's** *Divine Comedy* was distorted by the Catholic Church to instill fear within people creating the image of Hell so that they would obey the Laws of God or suffer the torments of Hell in which he colorfully described.

An individual's University education during medieval times in Europe, was divided into seven distinct areas, each represented by a particular planet and known as the seven liberal arts. It appears that **Dante** may have gathered his idea of "Hell" from this structure. He attributed these educational arts to the various planets. Within these arts, for example, grammar was assigned to the Moon, the quickest moving celestial body. Dialectic was assigned to Mercury, Rhetoric was ascribed to Venus, Music was attributed to the Sun, Arithmetic was the province of Mars, Geometry was governed by Jupiter and Astrology/Astronomy was attributed to the slowest moving body in the heavens, Saturn.

During the Renaissance, a more scientific form of astrology evolved in which court astrologers would actually augment their use of horoscopes with candid discoveries about the nature of the universe. Many of the great names in science at that time were also astrologers such as Tycho Brahe (1546-1601), Galileo Galilei (1564-1642) and Johannes Kepler (1571-1630). What was evolving at this time was the separation between astrology and astronomy where the former was being associated more with religion and merely a belief rather than a science. This was developing due to the correlation of events on earth to events in heaven as a belief system. Nonetheless, by the end of the Renaissance, the view of astrology as a science had completely collapsed with the breakdown of *Aristotelian Physics* and the rejection of there being a distinction between the celestial and sublunar realms. Thus having been the core historical foundation of astrological theory, it was by no means the development of *heliocentrism* by itself that undermined astrology. However, the perception merely changed largely due to a dividing line between belief and fact yet the appearance of heliocentrism and it's changing of world thought clashing with religion set in motion the division between astrology and astronomy.

We must keep in mind that the dim attitude regarding science in Europe, prior to the Renaissance, was what had in fact created the Dark Ages. Jews were both the moneylenders as well as the captains of ships. Why? Because possessing knowledge of mathematics during The Dark Ages was considered to be unfit for Christians and this interesting yet strange view that science and mathematics where the Devil's domain helped to prevent the resurrection of society after the fall of Rome.

Fibonacci (c. 1170–1250)
Leonardo Pisano Bigollo

Fibonacci or **Leonardo Pisano Bigollo** (1170–1250) was really the first to bring Arabic knowledge of mathematics into European practice. Europeans had still been using Roman numerals, which were not conducive to mathematics. In 1202 **Fibonacci** published the *Liber Abaci* introducing the *Modus Indorum* (*method of the Indians*) known as Arabic numerals. The book advocated numeration with the digits 0–9 with a place value. The book showed the practical importance of the new numeral system introducing multiplication and

Egyptian fractions applying them to commercial bookkeeping opening the door to Mercantilism. He applied these tools to the conversion of weights and measures, the calculation of interest, money-changing, and other applications helping to create banking.

We have seen throughout time a clash between science and religion. The Muslims thirst for knowledge led to their downfall to the militaristic Turks, and the rise of the Ottoman Empire through conquest of Christians and Muslims alike. The Muslim philosopher known as **Al-Ghazzālī** (**Abu Hāmed Mohammad ibn Mohammad al-Ghazzālī**) (1058-1111AD) wrote that scientific study shakes men's faith in God and undermines religion, which leads to the loss of belief in the origin of the world and the Creator. The same trend appeared in China during also the 3rd Century BC when Emperor **Tsin Shi Hwang-di** (246-210 B.C.) was warned about "dangerous scholars" who were being driven by books. He then ordered the burning of all books except on medicine, divination, and husbandry.

By the 16th and 17th century, astronomical advances had proven the regularity of comets as **Edmund Halley** (1656-1742) discovered their cyclical nature. Halley believed that the comet that carries his name was the same comet reappearing throughout history at regular intervals and had been recorded by contemporary historians throughout the ages. Halley saw, hidden within history, the same cyclical intervals of a comet. **William Whiston** (1667-1752), an ordained Anglican priest, postulated in his 1698 *A New Theory of the Earth* that the earth arose from the atmosphere of a comet and that the major changes see throughout earth's history could be accredited to the action of comets. He argued that biblical stories-such as the creation theory, the great deluge (flood), and ultimately the conflagration could all be explained scientifically. When published it was well received by intellectuals of the day such as **Isaac Newton** and **John Locke**. Then there was **Tycho Bhahe's** (1546–1601) "new star" demonstration that the higher heavens were subject to change and decay, meant that the world as a whole could no longer be envisaged as a compact inter-locking organism.

By the end of the 17th century, the age of enlightenment began to equate astrology and religion in the same category as "belief" rather than a proven science. Scientific findings expelling *Heliocentrism* began to irrevocably undermine the validity of religion and thus astrology. And by the 18th century, the ultimate problem for astrology became the evolution of science leaving it no longer in possession of any tenable theoretical basis. But once again the real issue was one of interpretation, for it was not the actual preaching of Christ, Mohamed, or

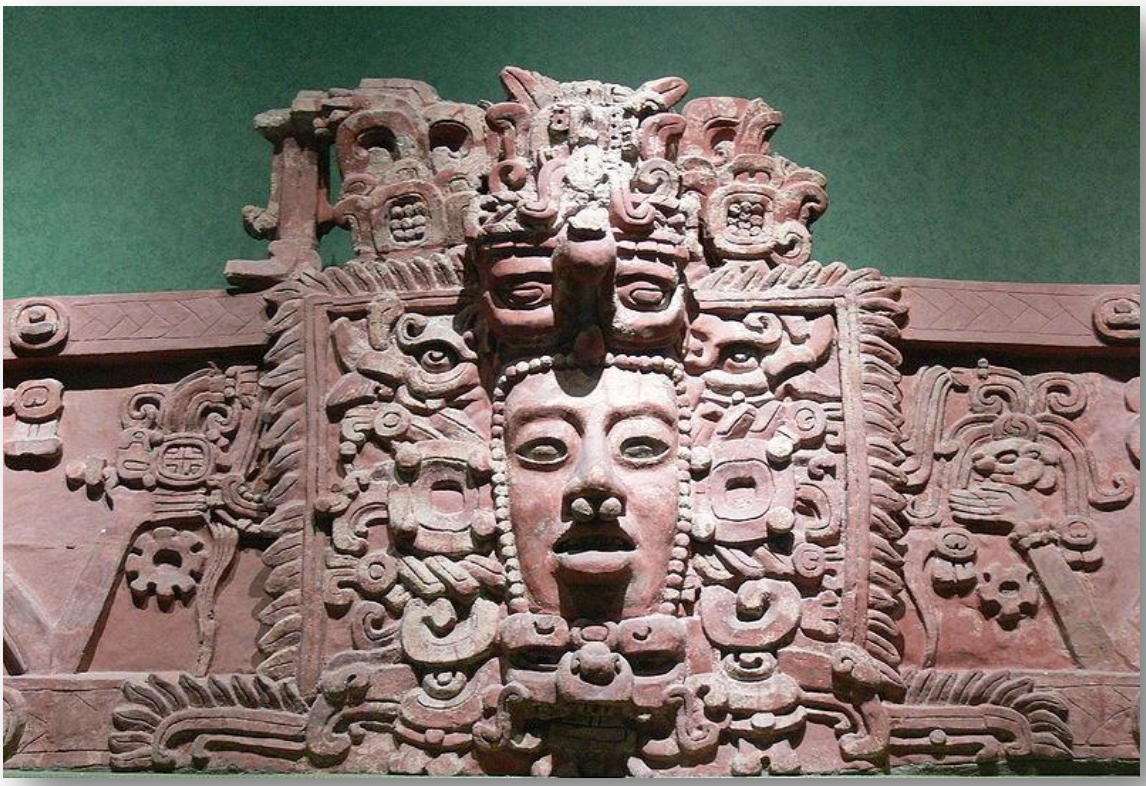
Buddha that ever suggested that the earth was the center of the universe. It was the interpretation of man which made this topic controversial enough to where others were killed.

In the 20th century, science succeeded over the various interpretations of religion and astrology. Science, acquiring a broader influential base, forced religion to yield regarding Heliocentrism. Of course there will always be some who cling to various references in religious texts and resist scientific fact based on aspects of those books regarding the age of the earth and the universe. Similar to those who usurp what the Maya investigated and distort their efforts to prove some biased perspective of a predetermined conclusion that the end is near.

Astrology proved an important endeavor of mankind prior to the Age of Enlightenment. It fell to the wayside and was categorized with religion in the contest for scientific knowledge. Nevertheless, setting aside the theory that the constellations above governed the events on earth, this field of exploration not merely mapped the heavens; it gave birth to understanding the universe bringing about the recognition of our very dynamic universe. Furthermore, this contributed to the base foundation for human studies and the documentation of astronomy, medicine, weather and the migration of animals.

The ***Precession of the Equinoxes*** was truly an important discovery. It established the dynamic structure of the universe and that everything was indeed cyclical in nature. The grandness of the time scale being 25,800 years was a remarkable discovery since it took more than one generation to even figure out something was different.

Chapter VII

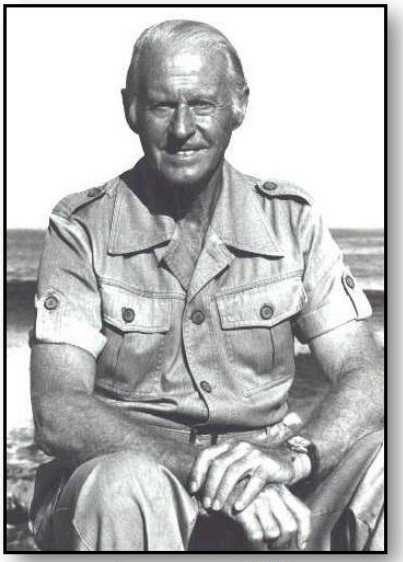


The Maya & Atlantis

We can see that the Maya were clearly hundreds of years ahead of Western Europe. The Mayan's use of cycles and their understanding of the importance of the concept of zero advanced their civilization far ahead of the Western World. The Olmec were the first major Mesoamerican civilization in Mexico, residing in the tropical lowlands of south-central Mexico in the modern-day states of Veracruz. They preceded the Maya and flourished in the region between about 1500BC to about 350BC. Practicing many of the hallmarks of Mesoamerican attributes such as ritualistic bloodletting and "ball games". It seems that the Long Count calendar, used by many subsequent Mesoamerican civilizations, as well as this concept of the "state of nothingness" or zero, may have been devised by the Olmecs. Three

of the six artifacts with the earliest Long Count calendar dates were all discovered inside of the immediate Olmec homeland and outside the area that the Maya would eventually settle. Argument contrary to the Olmec people originating these concepts and practices, is that the Olmec civilization had ended by the 4th Century BC, which was several centuries prior to the earliest known Long Count date artifact. This society was eventually replaced by the Zapotec and then the Maya who began in modern-day Guatemala and expanded into the Yucatán Peninsula beginning about 2000BC. This Pre-Classic period lasted until about 250AD, according to Mesoamerican chronology. Thereafter, many Maya cities finally reached their highest state of development only during the Classic period from about 250 to 900AD.

The legend of Atlantis was handed down by Plato and is considered by many to imply that the island in question is Antarctica and a pole shift caused a massive disbursement of ancient civilizations. Plato is said to have been given this history by the Egyptians, who claimed to have been survivors. This story also resonates in South America where there too exists a similar legend that they came from a great island. Some have postulated that this could have been Noah's great Biblical flood that reeked destruction on the last "world" or civilization. We see that there are intriguing and striking connections between the Maya and the Egyptians. Both peoples were considered a red race, neither white nor black. They have found traces of cocaine, cocoa, and tobacco in Egyptian mummies, all substances that only grow in South America. So there appears to have been trade taking place somehow between Egypt and South America.



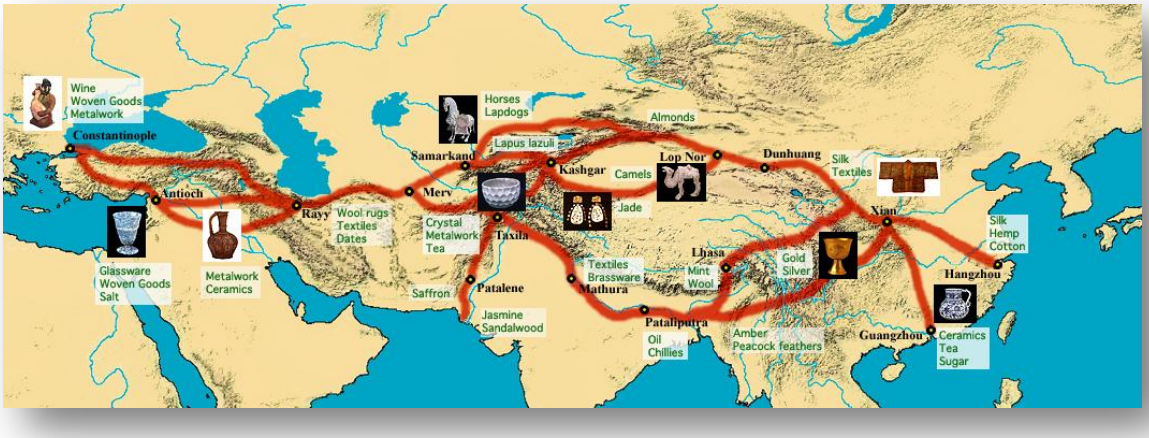
Thor Heyerdahl
(1914-2002)

These cultural connections have long inspired numerous theories of cross Atlantic trade. In 1947, **Thor Heyerdahl** (1914–2002) a Norwegian explorer and writer, set out across the Pacific Ocean from South America to the Polynesian islands using a raft he named *Kon-Tiki.* To prove that such maritime connections were indeed possible. His raft was named after the Inca sun god, *Viracocha*, for whom "Kon-

Tiki" was said to be an old name. Heyerdahl chronicled his adventures in a book and an Academy Award-winning documentary film all by the same name.

Heyerdahl, like others, believed that people from South America could have settled Polynesia in pre-Columbian times. Heyerdahl and his small team went to Peru, where they constructed the raft out of balsa logs and other native materials in an indigenous style as recorded in illustrations by Spanish conquistadores. The trip began on April 28th, 1947 and sailed for 101 days over 4,300 miles across the Pacific Ocean before smashing into a reef at Raroia in the Tuamotu Islands on August 7th, 1947. The original Kon-Tiki raft is now on display in the Kon-Tiki Museum in Oslo.

Although most anthropologists do not support this theory, Heyerdahl at least proved with his voyage that instead of a cross-Atlantic trade route, a trade route across the Pacific would have been possible. Instead of proving South America could have settled Polynesia, he established that this trade route could have indeed existed. Clearly Heyerdahl's Kon-Tiki expedition demonstrated that cross-Pacific trade was possible despite the fact that the expedition carried some modern equipment, such as a radio, watches, charts, sextant, and metal knives. Heyerdahl established that the raft itself could make the journey.



In ancient world travel the most established and legendary trade route was The Silk Road. It goes back to pre-historic times and has been dated to about 2000BC (Elizabeth Wayland Barber; The Mummies of Urumchi, Norton (1999)). This route takes its name from the Chinese silk trade that existed between Rome and the Han Dynasty (206BC– 220AD) and extended some

4,000 miles (6,500 km). A network of interlinking trade paths across the Afro-Eurasian landmass, The Silk Road connected East, South, and Western Asia with the Mediterranean and European world, as well as parts of North and East Africa.

During this time China tended to import wool and exotic foodstuffs from the West while selling silk in return. The spice trade was also a lucrative venture that actually provided incentive for Christopher Columbus to set sail trying to create a new trade route. With the discoveries of tobacco, cocaine, and cocoa in Egyptian mummies, the plausible explanation appears that the Silk Road network also extended across the islands of the Pacific perhaps connecting South America as well.

One remarkable cultural similarity is that both Egyptians and South Americans mummified their dead, used a form of writing known as hieroglyphics and both built pyramids. These similarities are what have long fueled the story of Atlantis being an actual place from which both cultures originated. There are others who argue it is not that Atlantis *actually* sunk or that there where 40 days and nights of constant rain, but that the poles shifted. This confirmed theory that the poles do shift has fueled modern visions of 2012.

These traversing merchants certainly spread more than goods – they also spread ideas. Ancient Rome overthrew its Tarquin king in 509BC giving birth to the Roman Republic and then Athens too saw the birth of Democracy within less than a year. Ideas could flow rapidly from culture to culture in ancient times thanks to trade. Similar to the fall of China that began with Tiananmen Square protests of June 4th, 1989 then followed by the November collapse of the Berlin Wall. Most people attributed this to the media connecting the world.

It is true that there are many unknowns and that neither the pros nor cons can claim victory in the Pre-Columbian trans-oceanic contact hypotheses. The Americas and Egypt appear to have been settled around the same time, 10,000 BC. Shifting the poles could of course disrupt weather thus causing the ice caps to melt, oceans to rise and re-form perhaps somewhere else. These polar shifts are also reflected in the known ice ages. There is an ancient copy of a map from the 16th century know as the *Turkish Piri Reis*, which is claimed to show Antarctica being dry land with

no ice or snow.

The *Epic of Gilgamesh* has been of interest to Christians ever since its discovery and account of a universal flood with significant parallels to the Flood of Noah. Even secular scholars have recognized the unprecedented parallel between the Babylonian, Phoenician, and Hebrew accounts of a great flood. We find a similar story of a great flood in Asia as well; Chinese myth has it that *Gong Gong*, ordered by the head of the gods, created a 22 year long flood as punishment for human misbehavior. It makes us wonder if these connections are anything more than shared mythology, or the cataclysmic end of the last age?

Virginia Steen - McIntyre

The book "Forbidden Archaeology" by Michael A. Cremo and Richard L. Thompson is about 900 pages of well documented evidence collecting all the unexplained phenomena on the subject that civilization has a much more interesting history than just 6,000 years. These two men exposed how evidence is being suppressed by the academic community because it conflicts with their established time line. This is standard operational procedure in virtually every field. Once an established view is made, others will not stand up and challenge that view. This is precisely what distorted the pictured painted of the Minoans thanks to Sir Arthur Evans and that of the Maya thanks to Sir Eric Sidney Thompson.

In Mexico during the 1960s, a stone tool was discovered about 75 miles south of Mexico City at a site known as *Hueyatlaco* an archeological site in Valsequillo, Mexico. Geologists working for the US Geological Survey dated the tool to 250,000 years old. Four tests were conducted using different methods and all concurred regarding the date. **Dr. Virginia Steen-McIntyre's** attempts to publish the findings were delayed for years as every effort to publish the work was met with obstruction.

After these excavations in the 1960s, the site became notorious for the establishment would not accept the dating despite the fact they could not prove it was false. As this finding placed human origins not beginning in Africa, as academia maintained, but revealed that their entire theory was perhaps completely unfounded. This archeological site demonstrated that sophisticated human-made tools were discovered in geographic strata with multiple peer reviewed studies that were dated to ca. 250,000 years old. This evidence destroyed the

academic consensus that habitation of the New World began with widespread human migration only about 13,000 to 16,000 years ago, and that Africa was the origin of human life. Academia still refuses to investigate with unbiased hands.

Academia has simply rejected out of hand the findings at Hueyatlaco and will not allow any debate on the subject in scientific journals. Cynthia Irwin-Williams led the team that first excavated the site in 1962, which she actually discovered with Juan Armenta Camacho. However, the excavation is often associated with Virginia Steen-McIntyre because of her continuing efforts to publicize the findings and opinions. Steen-McIntyre joined the team in 1966 as a graduate student, at the request of the project geologist Hal Malde at that time. Consequently, the excavation was associated with the U.S. Geological Survey.

The excavations were conducted using standard protocols, including securing the sites to prevent trespass, accidental disturbances, and contamination. During excavation, investigators discovered numerous stone tools ranging from relatively primitive implements at a smaller associated site, to more sophisticated items such as scrapers and double-edged blades uncovered at the main excavation site. The great diversity of tools made from non-local materials suggested that the region had been used by multiple groups over a considerable period. This also introduced perhaps trade since the materials were also not local.

In 1967, Jose L. Lorenzo of the Instituto Nacional de Antropología e Historia, claimed that implements had been planted at the site by local laborers in such a way as to make it difficult or impossible to determine which artifacts were discovered. Making such unfounded allegations without proof based solely on belief is unprofessional and has been the greatest crime against humanity. Irwin-Williams responded to these allegations arguing that Lorenzo's claims were malicious and without merit. Eventually, in 1969 Irwin-Williams cited statements of support from three prominent archeologists and anthropologists (Richard MacNeish, Hannah Marie Wormington and Frederick A. Peterson) who had each visited the site independently and attested to the integrity of the excavations and the professionalism of the group's methodology. Nonetheless, accusations of simply disbelief by people such as Lorenzo demonstrate the bias and lack of independence that obstructs advancing society.

By 1969, Szabo, Malde and Irwin-Williams published their first paper concerning the dating of the excavation site. The stone tools were discovered in a stratum that also contained animal remains. Radiocarbon dating of the animal remains produced an age of over 35,000 ybp (years before present). Uranium dating produced an age of 260,000 ybp (± 60,000 years). They stated that they had no definitive explanation for the anomalous results. Malde tried to explain the

dating problem arguing that perhaps the tool-bearing strata had possibly been eroded by an ancient streambed, thereby combining older and newer strata and complicating dating.

Finally, in 1973, Virginia Steen-MacIntyre, Malde and Roald Fryxell all returned to Hueyatalco to re-examine the geographic strata and more accurately determine an age for the tool-bearing strata. They were able to rule out Malde's streambed hypothesis and they then moved on to undertake an exhaustive analysis of volcanic ash and pumice from the original excavation site. Using the zircon fission-track dating method, geochemist C.W. Naeser dated samples of ash from Hueyatlaco's tool-bearing strata to 370,000 ybp +/- 240,000 years. Nevertheless, academia refuses to address this finding because it does not fit established theories.

Perhaps there is no other site in the world than Hueyatlaco that has so upset the established hoards of academia because of the confirmation of an anomalously distant age for human habitation. This does not fit the timeline that has been established coming out of Africa. Malde and Fryxell announced the findings at a Geological Society of America meeting, yet admitting that they could not account for the anomalous results.

The delays forced Steen-McIntyre to write her doctoral dissertation not on Hueyatlaco as planned, but rather on the dating of volcanic ash in geographic strata. However, in 1981, the journal ***Quaternary Research*** published a paper by Steen-McIntyre, Fyxell and Malde that defended an anomalously distant age of human habitation at Hueyatlaco using four independent tests to establish the dates. There has never been any evidence to dispute the findings, just unsupported accusations. The team has been harassed, and their careers have been impacted by their involvement in the site. Academia simply always resists anything that proves them wrong.

The book Forbidden Archaeology provided much of the content for the widely criticized 1996 NBC special *The Mysterious Origins of Man*. The academic community was up in arms for NBC airing a program that called their integrity into question. Yet, ironically their criticizing the book "*Forbidden Archaeology"* is part of free speech, trying to threaten NBC and suppress it is not. By NBC publishing the fact that there were unexplained artifacts found, put the decided time line in questionable light. It becomes a possibility that indeed there were previous civilizations that were wiped out by some event as was the Biblical story of Noah. But there are also trade connections that cannot be explained with the current narrow views maintained by many academics.

In an interview published by the Midwestern Epigraphic Journal, Volume 16, Number 1, 2002, Virginia Steen-McIntyre, FMES, makes it clear in answering the question, *"What's wrong with science*?"-

"Nothing with science per se. It is a method used for looking at a small part of reality, mainly the physical universe. The problem arises when people, both scientists and the general public, try to make it something it is not -- a world view, for example."

This has been the greatest detriment to advancing "science" in any field - the human tendency to resist change and defend the status quo. Even Christiaan Huygens was pushed aside in favor of Sir Issac Newton because of the political reason that he was Dutch thus lacking the local support of the English society. We see a reoccurring human problem with science in someone has to be dead before his ideas are venerated. Trying to make advances from within the establishment is never easy. Ideas normally come from those outside the accepted establishment for they seek to stay within the confines of acceptable norms.

Controversy between the academia and archaeologists erupted once again during the early 1990s. This time it was a German research group who published a few short papers reporting that they had discovered significant traces of cocaine, nicotine, and "hashish" in several Egyptian mummies. Some of these mummified remains were more than 3,000 years old. The dispute emerged because the academics were teaching their theory of ancient man, 13,000 years before the present time, traveling across an Alaskan land bridge down into South America. This discovery illustrated yet another major conflict with the established beliefs precise for the same reason Bruno was burned alive at the stake.

Criticisms of the German findings were politely addressed at first, but quickly denigrated to nasty name calling largely because again a mainstream TV show was made on the subject that exposed the fallacy with the established norm. After this TV show, the German papers were met with nasty and preposterous allegations. The academics began accusing them of disrupting the field of botany since they refused to accept an ancient Pacific trade route *could* have existed, then implying that they were using those drugs themselves and they had contaminated their research samples. Some accused the Germans of making mummies that were fakes. Next was to accuse them of using analytical techniques that were faulty. Of course, proof was never needed for their accusations. The intimidation worked and the German researchers were effectively scoffed down to the point that they had to respond with, *"further research was needed."*

This in my opinion should be a crime for it is precisely people like this that fought at the time the newfangled idea that the Earth was round instead of flat or that the Earth revolved around the Sun. Their logic against these bold ideas was then where are heaven and hell if there is no up and down? Any challenge to the establishment is always met with nasty accusations.

In 1995 another much longer three part article appeared on the subject in a German scholarly journal. Though written by a different batch of authors, one individual from the original team

Heinrich Schliemann
(1822–1890)

Franz Parsch, was listed as a coauthor on all three pieces. The article was mostly about evidence of pulmonary bleeding in a 3,000-year-old Egyptian mummy, but briefly mentioned that an analysis had found significant traces once again of cocaine, nicotine, and THC. This was a simple matter-of-fact paper and no acknowledgment that anything was out of the ordinary was stated. With this they silenced any investigation that had dared to cast doubt upon their unproven theories taught in universities to this day.

Schliemann's Wife
Jewels of Troy

A British TV studio was about to reveal the dark side of academia once again by putting together a BBC documentary on the Germans' work. It focused on one of the investigators, a forensic toxicologist named Svetla Balabanova. Balabanova told interviewers that she initially hadn't believed the results either, having been fed the unproven theory of the transcontinental land-bridge. She assumed there was an error and had the results checked by other labs. The documentary also talked to a respected British Egyptologist Rosalie David, who vouched for the authenticity of the Egyptian mummies since again academics said they were fakes. That accusation set aside, the wild academic claims that the mummies were fake rang a bell ironically as similar accusations had been made against Heinrich Schliemann. David herself also tested Egyptian mummies and, to her surprise, found traces of nicotine. The land-bridge theory's certainty has to be questioned due to these findings. Nevertheless, academia still clings to its old theories and resists any new evidence that calls into question their established theories.

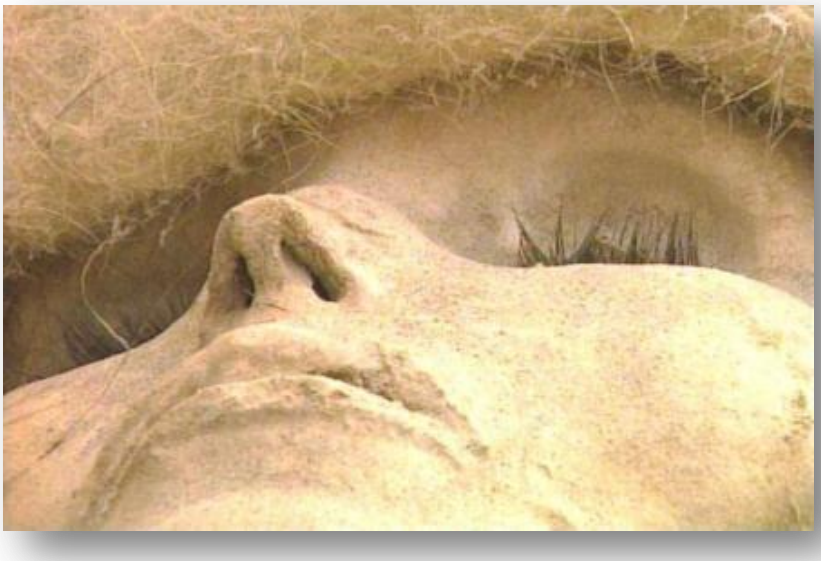
The TV program appeared worldwide and a transcript is available online at the University of Iowa. (**www.uiowa.edu/~anthro/webcourse/lost/coctrans.htm.**) A documentary can be also watched (**http://www.channel4.com/programmes/the-mystery-of-the-cocaine-mummies/4od**).The show gave ample impression that a new discovery had been made, doing what the researchers couldn't do – standing up to the academic communities whose ignorant attribute of constantly resisting change prevents the advancement of knowledge no different than those that attacked Bruno and Galileo.

Heinrich Schliemann (1822-1890) discovered Troy by taking Homer's work The Odyssey and setting out to prove it was not just a children's story. Thus finding the great city Schliemann was

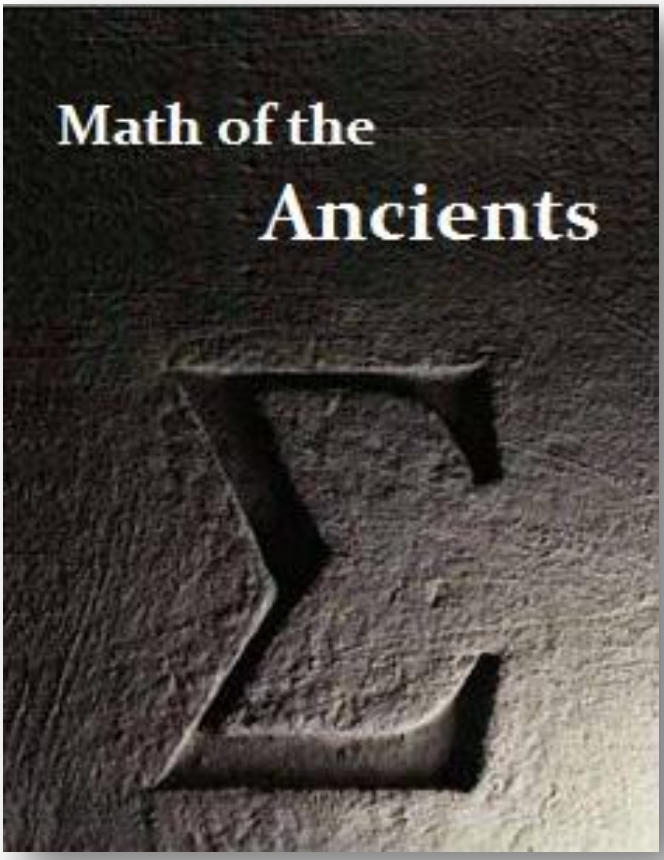
accused of fraud as the photo of his wife was argued to be a fake. Schliemann went on to discover Mycenae, and Thebes as academics pontificated about his findings from their ivory towers without even attempting to prove they were correct.

Unbelievably the academics refuse to even mention the possible existence of trade routes between South America and Egypt or across the Pacific by island hopping. They ignore evidence found along the ancient Silk Road where mummies have been found buried along the way dating long before the accepted international trade routes and before recorded history. Episode one of Japan's NHK's New Silk Road series covers the ancient civilization of the Takla Makan desert, in the center of the Eurasian landmass, currently in China. Pictured here is a mummified woman with European facial features from the Silk Road, who is still beautiful even though she's been dead for over 3,000 years. The fact that she is not Asian establishes the existence of trade long before recorded history.

No matter what evidence appears today, established theories are just that – theories. These are taught for decades and there are simply barriers to change in all fields of science be it hard-science or social-science such as economics. Established views will only change during dramatic events and then when it serves a purpose of those in power. So was there a previous world destroyed by water that corresponds to the story of Noah and serves as a base for Atlantis? You can count on one thing. The established consensus will not allow the question to be investigated.



Chapter VIII



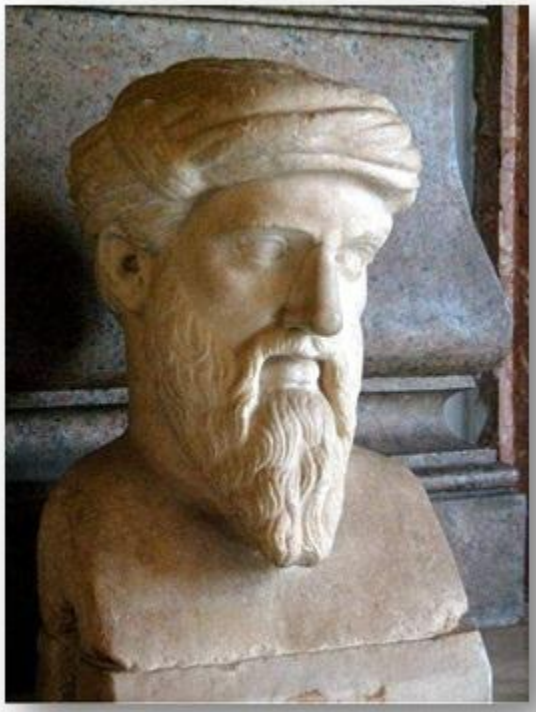
The Math of the ancients

Ancient comprehension of numbers reflects each civilizations understanding of the universe. The study of numbers is truly ancient in origin; we find it is how they perceived the world in which they lived. When one begins to study the ancient philosophies, what you walk away with is a core understanding that they saw mathematics as the means of truly expressing the laws that governed everything surrounding them. When they looked in the night sky, they perceived the structure of the universe and viewed the constant movement of the heavens. They became obsessed with mathematics and dived deeply into its workings.

The Maya were remarkable in both their knowledge of mathematics and astronomy. What is perhaps most interesting is the fact that they independently developed the concept of zero in math. By the middle of the 2nd millennium BC, the Babylonian mathematics had a sophisticated sexagesimal positional numeral system. However, they did not have the concept of zero. They did use a positional value indicating a space between sexagesimal numerals.

The concept of zero as an actual number rather than a symbol for separation is attributed to India. By the 9th century AD, we find practical calculations were carried out using zero. The Indian scholar Pingala (circa 5th-2nd century BC) used binary numbers in the form of short and long syllables creating something like Morse code. The Sanskrit word śūnya was used to refer to zero or void. We also find a blank being used on counting boards to represent zero dating back to India in the 4th century BC. It was in 498 AD, that the Indian mathematician and astronomer Aryabhata is reported to have stated that ***"sthānāt sthānaṁ daśaguṇaṁ syāt"*** meaning ***"place to place in ten times in value"***. This is clearly the use of a decimal system. The oldest known text to use a decimal place-value system, that also included zero, dates from 458AD and is known as the Jain text from India entitled the ***Lokavibhâga***. The migration of this concept was adopted by the Arabs and eventually it is brought to the West by Fibonacci or Leonardo Pisano Bigollo (c. 1170–1250). This was really the first emergence of the Arabic knowledge of mathematics into Europe which had still been using Roman numerals. In 1202 Fibonacci published the ***Liber Abaci*** introducing the modus Indorum (method of the Indians) known as Arabic numerals. The book advocated numeration with the digits 0–9 with a place value.

The ancients of the West defined the *perfect* number as being "6" because it was equal to the sum of the number by which it can be divided (1+2+3=6). The next *perfect* number is 28 (1+2+4+7+14=28) and this is followed by 496 (1+2+4+16+31+62+248=496). Numerology and religion are almost synonymous among the ancients and is still self-evident even in Judeo-Christian beliefs. It was the Jewish philosopher, **Philo Judeaeus of Alexandra Egypt** (20BC-40AD), who claimed that God created the world is 6 days because this was the *perfect number*. **Saint Augustine** (354-430AD) in his work ***The City of God*** wrote that, "*Six is a number perfect in itself, and not because God created the world in six days; rather the contrary is true; God created the world in six days because this number is perfect in itself …*". This gives you the indication that the thinking process of the ancients, when it came to numbers, was substantially powerful.

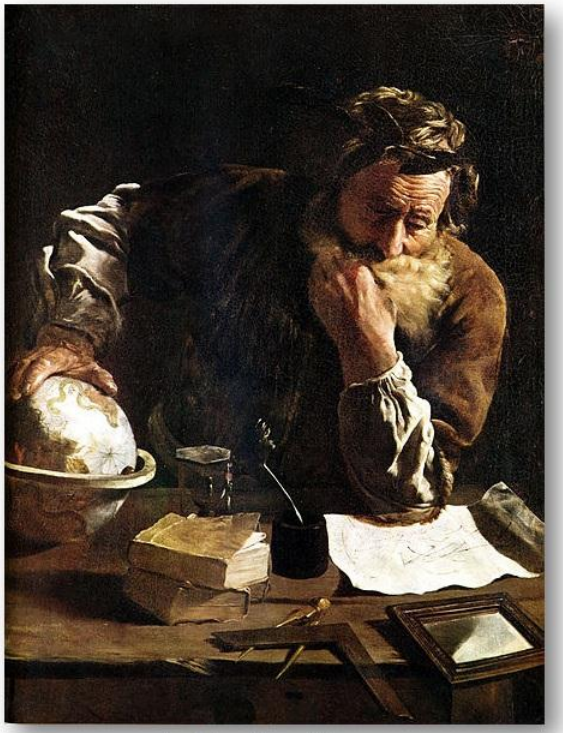


Pythagoras
(c. 570– 495BC)

Pythagoras (580-500BC) may be the most renowned mathematician to have ever lived he was one of the first remembered by history to grasp numbers as abstract entities within their own right. This was the age of ancient wonder. To give you some time frame of reference, Pythagoras was to **Aristotle** (384-322BC) what Thomas Jefferson and George Washington are to us today. His teaching of mathematics opened a new world of admiration. He coined the word *"philosophy"* by merging of the two Greek words *phil* meaning "*to love*" and *sophos* meaning "wise" yielding the *"love of wisdom"*. To this day we have the word "*sophist*" meaning a wise man or expert, *"sophistry"* meaning a subtly deceptive reasoning or argumentation and "*sophisticated*" which originally meant a learned man. The Greek word *phil* of course was the foundation for **William Penn** (1644-1718) selecting the name of his city, *"Philadelphia"*. Penn did correctly translate it as *"The City of Brotherly Love"* yet he misconstrued the meaning of *"brotherly love".* In Greek *Philadelphus* was given as the title of **Ptolemy II** (308-246BC), who banished his first wife **Arsinoe II** (c.316-268) daughter of the King of Thrace, and shocked the world by marrying his sister. The title "*Philometor*" meant one who loves his mother.

To be a *Philosopher* was to be a man who loved wisdom and it was also Pythagoras who introduced the theory of metempsychosis, or transmigration of the soul after death into another human body or taking the form of another species, to the masses. Pythagorean creed can be described as the *"spiritual desire to free oneself from the cycle of birth and death".* The truly mystical Pythagorean principle had many dedicated followers and thus a cultish society developed upon these beliefs. This group is best known for their developments in mathematics and the application of mathematics to the very core concept of order itself. They are said to have worshiped *arithmos*, the intrinsic property of whole numbers and their ratios, as if a god.

Ptolemy II (308-246BC) with his first wife Arsinoe II (c.316-268)
who he banished and married his sister



Archimedes of Syracuse
(circa 287– 212BC)

In the 5th Century BC **Hippasus of Metaporitum** (5th century BC) discovered what is known as "*phi*" or the "*Golden Ratio*". This number 1.6180339887, being never-ending, non-repeating and not a whole number nor a ratio of one (i.e. 1/2), set off total disarray in the community. Legend has it that the Pythagorean people so distraught by this illogical finding, by their standards, were claimed to have sacrificed a hundred oxen. However, this story is unlikely since the Pythagoreans were vegetarians; to them eating an animal meant perhaps eating a long and cherished friend.

We must understand that mathematics to the ancients rose to the level of religion. Pythagoras's ground breaking discoveries are not limited to just his theorem involving the length of the sides of a right triangle. He also is credited with the discovery of the harmonic progression in the notes of the music scale. He discovered that music intervals and the pitch of notes correspond to the length of the vibrating strings. He is said to have divided a string into consecutive integers producing a different note of a pleasing sound up to a point. He then discovered that two arbitrary musical notes played together produce a harsh sound. He found that the octave is changed by the ratio of the string etcetera; the key to unlocking this was mathematics.

The Pythagoreans saw the world mathematically from the heavens to music all could be worked out into perfect mathematic justifications. Even when we read Aristotle's work he states in his Metaphysics, "*The so-called Pythagoreans applied themselves to mathematics, and were the first to develop this science; and through penetrating it, they came to fancy that its principles are principles of all things.*" **Albert Einstein** (1879-1955) wrote in his letters to Solovine, "*Mathematics is only a means for expressing the laws that govern phenomena*."

Pythagoreans indeed took math to the level of religion, and we must not forget that one of the central roles of a priest in ancient times was managing the calendar. However, it was **Archimedes of Syracuse** (c. 287– 212BC) was a Greek mathematician, physicist, engineer, inventor, and astronomer. Archimedes is generally considered to be the greatest mathematician of antiquity and one of the greatest of all time. He died during the Siege of

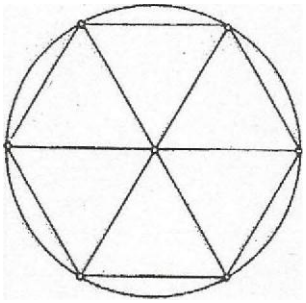
Syracuse when he was killed by a Roman soldier despite orders that he should not be harmed. Among his contributions in physics are the foundations of hydrostatics, statics and an explanation of the principle of the lever, which was monumental. He is also credited with designing innovative machines, including siege engines and the screw pump that bears his name. There are stories that he used mirrors to set ships on fire. He also proved that the sphere has two thirds of the volume and surface area of the cylinder (including the bases of the latter), and regarded this as the greatest of his mathematical achievements. Archimedes used the method of exhaustion to calculate the area under the arc of a parabola with the summation of an infinite series, and gave a remarkably accurate approximation of ***Pi*** (π). He also defined formulae for the volumes of surfaces of revolution, the spiral bearing his name, and an ingenious system for expressing very large numbers.

Mathematicians from Alexandria read and quoted Archimedes, but the first comprehensive compilation of his writings did not appear until c. 530AD published by ***Isidore of Miletus***, the Byzantine architect that ***Emperor Justinian I*** (born c. 482; emperor 527–565AD) commissioned to design the church of ***Hagia Soph***ia in Constantinople constructed between 532-537AD. Commentaries on the works of Archimedes were written by ***Eutocius of Ascalon*** (c. 480–540) in the 6th century AD, which dramatically increased his notoriety. The relatively few copies of Archimedes' written work have actually survived. Nonetheless, he remained influential throughout the Middle Ages as a source of ideas for scientists especially during the Renaissance. It was not until 1906 when previously unknown works by Archimedes were discovered namely the ***Palimpsest*** opening the door to how he obtained mathematical results and his thinking process.

We must appreciate is that our knowledge of the Greeks is far more understood thanks to the Romans. Yet Greece was the emerging market for Babylon and Egypt. Greece during the Heroic Period prior to the eruption of Santorini (Thera) that weakened the Minoan civilization was a third world country in those early days still emerging. It collapsed after it conquered Troy and Crete. After it fell into the Dark Age, Greek civilization was reborn yet was still struggling prior to the first Persian invasion of Greece, which had been ended by the Athenian victory at the Battle of Marathon in 490 BC. Xerxes had amassed a huge army and navy, and set out to conquer all of Greece. The Battle of Thermopylae was fought between an alliance of Greek city-states, led by King Leonidas of Sparta, and the Persian Empire of Xerxes I over the course of three days, during the second Persian invasion of Greece in August or September 480 BC. Only after this second invasion defeat in 480BC do we begin to see the rise of Greece against North Africa and Mesopotamia. The Greeks absorbed the knowledge acquired by the Babylonians and Plato himself stated he visited Egypt where he was given the story of Atlantis.

Indeed, the oldest recorded document concerning anything to do with mathematics comes from ancient Egypt. This Egyptian document has become known as the ***Rhind Papyrus*** named for the person who purchased it in 1858. It is also known as the ***Ahmes Papyrus*** named for the scribe who wrote it copying an earlier document. This papyrus was written about 1650BC and records only the solution to 84 problems, but without providing the method of calculating the solution. It begins stating, "*Accurate reckoning. The entrance into the knowledge of all existing things and all obscure secrets".* It refers to an earlier copy from about 2000-1800BC, but it is likely handed down from the age of **Imhotep** (2650-2600BC), who supervised the construction of the pyramids around 3000BC.

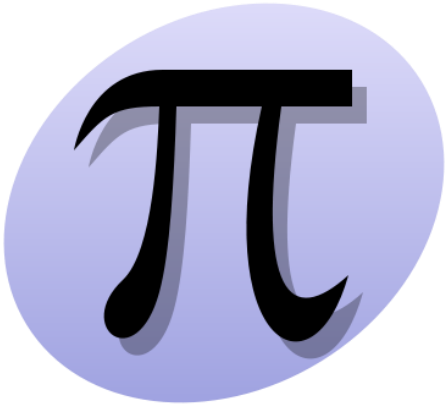
The attempts to measure the circle led to profound discoveries and still impact our lives today. Measuring a cycle in 360 degrees of an angle all emanates from the Babylonians. They clearly knew that the perimeter of a hexagon is precisely 6 times the radius of the overlaid circumscribed circle. This appears to be the origin of the Babylonian numerical system being sexagesimal (60 based). The Babylonians like the Romans also placed the cycle of their year in a 360 day calendar. Again, this perhaps gives support to why they created a number system based upon the unit 60. It appears that with **TIME**, the ancients knew this was incorrect and thus the job of the high priest became to adjustment of the calendar.



It was **Julius Caesar** (100-44BC) who revised the Roman calendar into what we call the *Julian calendar* in 46 BC and took the office of high priest *Pontiff Maximus*. During his time the political oligarchy had corrupted the calendar by bribing the priests to insert days to stall elections. It was commonly known that the calendar, then based upon 360 days, was wrong and there was a need for adjustment. As late as 1582 **Pope Gregory XIII** (1502-1585) made the final adjustment to Caesar's calendar. He modified that there would be no leap year when the year is divisible by 100 unless also divisible by 400 (i.e.; 1800, 1900 but not 2000).

The number ***Pi*** (π) is a mathematical constant that is the ratio of a circle's circumference to its diameter. ***Pi*** (π) is approximately equal to 3.14159. They seem to have understood that the wider a circle is across, the longer it is around. They perhaps made this discovery noticing that the ratio that exists between two proportional quantities will never change. Thus, it appears that geometry was the first mathematical concept that made progress in the knowledge of man. Therefore, the ancients appear to have discovered ***Pi*** through the understanding of proportionality. It is clear that both the Babylonians and the Egyptians knew of the existence of ***Pi*** (π). The Babylonians used 3 1/8 3.125. We also do fin 3 1/7 or 3.1428 was used among the ancients. It has been represented by the Greek letter "π" ever since the mid-18th century.

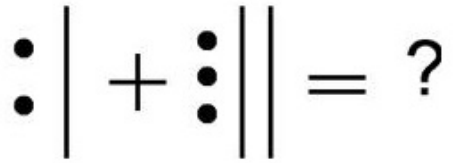
Pi (π) is an irrational number, which means that it cannot be expressed exactly as a ratio of two integers such as 22/7 or other fractions that are commonly used to approximate it. Subsequently, its decimal representation never ends and never repeats – it continues forever. Nonetheless, ***Pi*** (π) is also a transcendental number – a number that is not the root of any nonzero polynomial having rational coefficients. The transcendence of ***Pi*** (π) implies that it is impossible to solve the ancient challenge of squaring the circle with a compass and straight-edge.



The superstition against science had dominated European thought as society was crawling out of the **Dark Ages.** The devil's work at the time was known as mathematics. This depravation of knowledge led to a serious void. Europe had only reached where the Babylonians were nearly 2,500 years before as it entered the 17th century. It was strangely the Muslim world that saved knowledge for this was the only source that was filtering into Europe since the Muslims were in contact with the Hindus who in turn were in contact with China. The Europeans lost even the basic knowledge of ***Pi*** (π) until it was an amateur mathematician, Francois Viete (1540-1603), who at last matched the level of understanding of who we now consider to be the "***Father of Physics***" Archimedes of Syracuse (287BC-212BC). This little known amateur Viete was a lawyer in Brittany (France) who was forced to flee during the persecution of the Huguenots. For six years Viete was deprived of his profession and spent time pondering the mysteries of the world from a mathematical perspective. He was restored to a normal life when the former Huguenot rose to the throne of France, Henry IV (1589-1610). Once restored as a Royal Privy Councilor in 1589, he won favor with the king by using his self-taught math skills to break the Spanish code made up of 500 cyphers. The Spanish accused him of being in league with the devil otherwise, surely no man could have done that alone without supernatural assistance. It was Viete who coined the terms "***negative***"· and "***coefficient***."

For thousands of years, mathematicians have attempted to extend their understanding of ***Pi*** (π), sometimes by computing its value to a high degree of accuracy. Before the 16th century, mathematicians such as Archimedes and Liu Hui used geometrical techniques, based on polygons, to estimate the value of ***Pi*** (π). Not until the 16th century do we see new algorithms based on infinite series that truly revolutionized the computation of ***Pi*** (π).

Mayan Math



0.)	5.)	10.)	15.)
1.)	6.)	11.)	16.)
2.)	7.)	12.)	17.)
3.)	8.)	13.)	18.)
4.)	9.)	14.)	19.)

The Maya number system was a base twenty system. It has been argued that the reason for Mayan base 20 arose from ancient people who counted on both their fingers and their toes. Although a wonderful primitive vision, it was still a decimal based system times two. A base 20 system is called a ***vigesimal*** system. Obviously the number 5 (five) plays a major role within this system. Surprising and advanced features of the Mayan number system are the zero, denoted by a shell, and the positional nature of the system. However, just as Eastern thought appears to have presumed the earth was flat, at the same time their number systems appear to be decimal based. This was also true of China. The Chinese number system was based upon the number 10 (ten) known as the *decimal system*, They too discovered the equivalent to the digit zero. This seems to have made its way into the Hindu's system and then was brought to Europe by the Arabs and eventually Fibonacci (c. 1170–1250) in his 1202 publication - ***Liber Abaci.***

In a true base 20 system the first number would denote the number of units up to 19, the next would denote the number of 20's up to 19, the next the number of 400's up to 19, etc. However although the Maya number system starts this way with the units up to 19 and the 20's up to 19, it changes in the third place and this denotes the number of 360's up to 19 instead of the number of 400's. After this the system reverts to multiples of 20 so the fourth place is the number of 18×20^2, the next the number of 18×20^3 and so on. Here are two examples found in the ruins of Mayan towns. The first example [8;14;3;1;12] represents

$$\mathbf{12 + 1 \times 20 + 3 \times 18 \times 20 + 14 \times 18 \times 20^2 + 8 \times 18 \times 20^3 = 1253912.}$$

As a second example [9;8;9;13;0] represents

$$\mathbf{0 + 13 \times 20 + 9 \times 18 \times 20 + 8 \times 18 \times 20^2 + 9 \times 18 \times 20^3 = 1357100.}$$

This is the system used in the Dresden Codex, which is the only system for which we have documented written evidence. It has been suggested that this is a numerical system of the elite Mayan priests and astronomers used only for astronomical and calendar calculations. This is of course speculation. It was the system used for calendars no doubt. However, to argue that it is absurd that a base 20 system would have been used by the merchants and in everyday speech is just not being practical. Overlooked is the fact that the base of the number system being 20 also played a very major role in the structure of the calendar. Keep in mind that coca beans were money. It is entirely possible that 20 was also a monetary unit such as twenty pennies. To argue that somehow a 20 base monetary system would be unpractical, to the contrary – the United States employed such a system during the 19th century as well minting 20 cents coins between 1875 and 1878 until the silver standard was abandoned. The United States also issued 2 cent coins after the Civil War between 1864 and 1873. We also see $2 bills have still been printed into recent years. Canada also issues $2 bills and hey – anybody have change for a $20? Any argument that a base system of 20 would not be practical for merchants should take a closer look around the present. As we are about to now explore, the Mayan base 20 numerical system was an integral part of the calendar. The concept of a circle as we will see was also a vital link to understanding the Mayan calendar. Where Western thought oddly understood the world was a sphere and not flat, in their thinking process they were linear and saw everything reduced to a single straight line of cause and effect. The Eastern conception is cyclical based. Thus, the view that all things return to the same position is vital to understanding the thinking process of the Maya.

United States 1875 Silver 20 cent piece

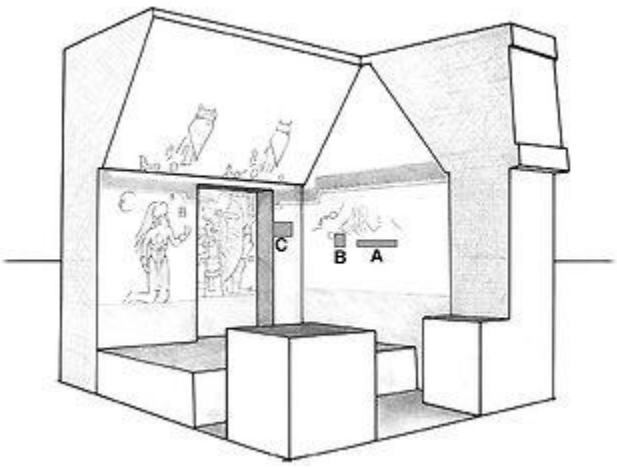
Chapter IX

Maya the Lords of Time

Satellites have exposed 8,000 years of obscured ancient civilizations extending back now some 2,000 years. Many progressive archaeologists have developed large-scale methods of identifying ancient human settlements from the skies above. Mounds of earth covering ancient human settlements, such as *Tell Brak* in northeastern Syria, can now be analyzed remotely using satellite imagery. What was once hidden in the landscape of the fertile crescent of the Middle East, is now unearthed from above using satellites that have exposed intricate networks of small settlements that hold vital clues to the formation of ancient civilizations.

***Legal Code of* Ur-Nammu**
(circa 2100BC)

What was uncovered during the First Gulf War with the invasion of Iraq was the *Legal Code of Ur-Nammu* (ca. 2100BC) which is now the oldest known written law code predating Hammurabi by about 300 years. Thanks to the translation efforts of Martin Schoen, the established timeline of civilization has been extended back demonstrating that to come together, mankind needs established rules.



Nevertheless, new discoveries are made concerning ancient civilizations like the Maya all the time. Our sense of history must remain fluid bending with the wind as new discoveries are made.

Recently, research supported by the National Geographic Society has discovered a 1,000-year-old house in Guatemala. Its interior is adorned with paintings of people, astronomical symbols, numbers and the earliest known Mayan calendar ever found. According to archaeologists, the mural covers three walls and the ceiling of this dwelling. Reportedly in the Journal of Science it is also the first Mayan art discovered in a building thought to be a house. The painted figure of a man, possibly a scribe who once lived in the house, is illuminated through a doorway.

What has sparked interest beyond the first mural in a private home is the fact that the researchers believe dates written on the walls represent astronomical cycles of Mars, Venus, and lunar eclipses for 7,000 years. This strongly indicates that the Mayans had computed the sky's events hundreds of years before their now-famous Codices, the hieroglyphic manuscripts that record the civilization's history and chronicles, were scripted. The oldest of the codices was written about 1300 AD. Here, the wall painting appears to be used as a black board giving rise to the theory that the author was an educated scribe. Contrary to the hyped purported belief that the Maya predicted the end of the world for December 21st, 2012, no such omen was found in this latest discovery. Clearly, then the Maya saw these as cyclical turning points only.

We know that the ancient Mayan civilization reached the pinnacle of its power around the 6th century AD. The territory covered during the peak of the Mayan civilization included all of Guatemala, Belize, and parts of Honduras, El Salvador and Mexico. This discovery dates from the Maya classic period, when many of the temples and palaces were built. This dwelling is part of a city called Xultun, in Guatemala's largest and northernmost region, Peten. The murals on the walls include a sitting king garlanded with feathers. Another painting shows a man in orange, holding a pen who may be the house's occupant, a scribe. Four numbers on one of the walls may represent astronomical cycles.

Discoveries like this house show that the Maya indeed simply predicted the cycles *within* time and there is no indication that the end of this current cycle should be taken as the "end of time". This mural implies that the "world" will continue 7,000 more years but for some unexplainable reason people keep searching for apocalyptic endings. Much of this hype that the

world will end is loosely tied to debatable interpretations of the Judeo-Christian Bible. There is a view that the Biblical prophetic understanding is that God has established a 7 day (7,000 solar-year) time plan for his creation of mankind on Earth. Some point to written evidence that this revelation has been known since the 2nd century AD. God told Isaiah during the 8th Century BC:

> *"for I am God, and there is none else; I am God, and there is none like me, declaring the end from the beginning, and from ancient times the things that are not yet done" (Isaiah 46:9-10).*

This implies that God said there would be an *end* that followed the *beginning*. It is argued that God did not mean he created the earth in 6 days, followed by a day of rest (the 7th day Sabbath). Instead, they point to what God told Moses in the 14th Century BC (recorded in Psalms 90:4) with respect to the actual "length of time" of a "day". His 7000 year event is explained conspicuously found in a letter of Peter's in the 1st Century AD, concerning this timing for the Second Coming of Jesus:

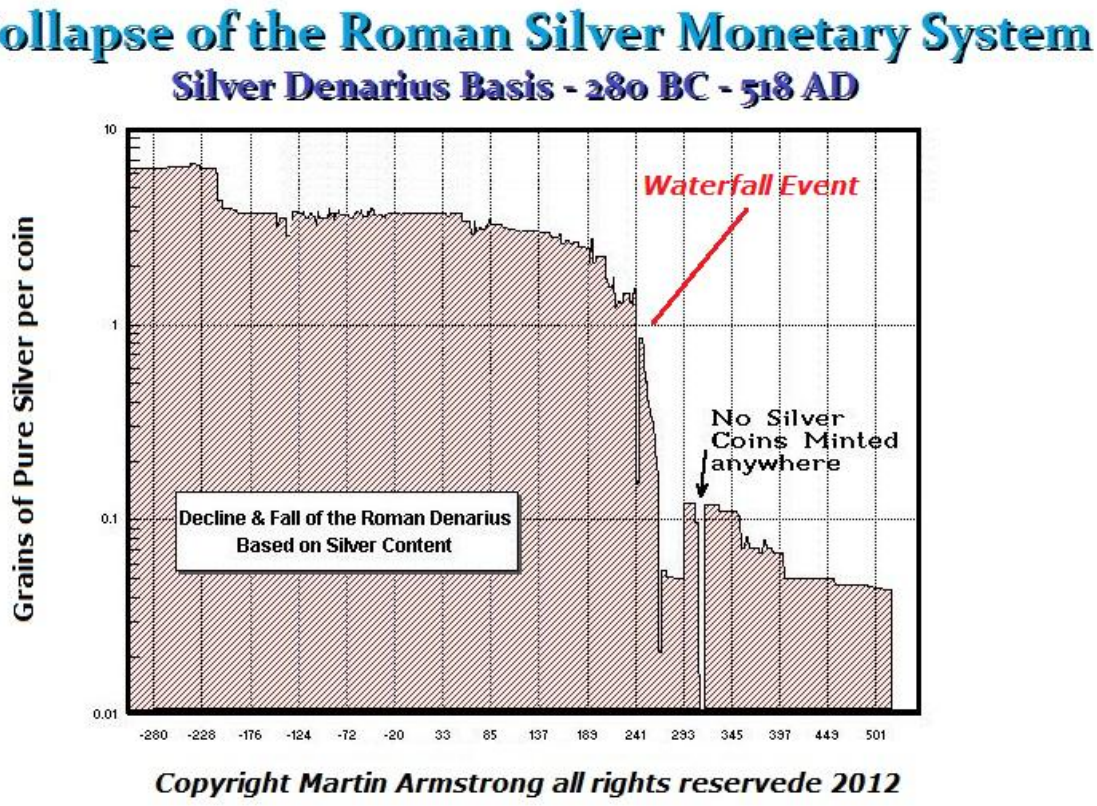
> *"Where is the promise of his (2nd) coming? ... But, beloved, be not ignorant of this one thing, that one day is with the Lord as a thousand years, and a thousand years as one day… the "day of the Lord" will come as a thief in the night … the earth also and the works that are therein shall be burned up"*
> *(II Peter 3:4-10).*

There have been many that concluded there is a cycle of 6,000 years up and 1,000 years down. Even the Biblical Revelations Chapter 20 states:

> *"[6:] Christ, and shall reign with him a thousand years. [7:] And when the thousand years are expired, Satan shall be loosed out of his prison."*

These passages clearly suggest a cycle. So the idea of reoccurring patterns is not foreign to Western Judeo/Christian beliefs.

People have been trying to predict the "end of the world" since the beginning of the world grasping at anything to justify that Judgment Day prediction. Perhaps it is steeped in jealousy that they feel cheated in material wealth, power, or talent (or all of the above) so they keep wishing to even the score. Even the Book of Revelations in the Bible puts a time limit on Christ



ruling the earth as 1,000 years. It then states a cycle begins and the devil shall be unleashed from his prison. Clearly, the second coming is not the end of the world either.

On one wall of the Mayan home are four long numbers that represent one-third of a million to 2.5 million days, perhaps bring together all of the astronomical cycles that the Maya believed to be important. This appears to be unique insofar as it is the first place the Maya tabulated all of these cycles in such a manner. A date is etched into the plaster surface that may represent the last date of the scribe —813AD. Since the end of the Maya civilization came with the next generate around 900AD, it is likely that a gradual steady decline from this date was put into motion that the astute always can see ahead of the majority. The collapse would have been rapid as in a *Waterfall Event*, which seems to come out of nowhere, and is captured here in the chart of the decline of their ancient monetary system. Unfortunately, the Maya did not create coinage so there is no way to depict a similar view of their economy. We find though, that the final collapse of civilizations is always represented by a Waterfall Event, like the fall of Communism in 1989.

The Maya were not predicting the end of time, but simply flipping the pages of a calendar from December to January for a new cycle or year. On another wall in the Mayan house, we find columns upon columns of numbers. Some deciphered as a calendar and other calculations, some tracking the moon's phases, others trying to reconcile lunar periods with solar calendars,

and another with red notes that seem to be corrections on other calculations. Clearly, this is a scribe who is familiar with cycles and this is a catalogue that predicts eclipses and turning point within these cycles of events. This was accomplished with amazingly precise astronomical calculations. The columns cover a period of 7,000-years creating a table that is filled with numbers calculating the length of time that Venus and Mars take to crisscross the sky twice. Anyone familiar with cycles can see that this is a table looking for the Superposition events when the cycles of individual entities combine to produce exceptional major events.

Keep in mind that the Maya were experts in time, yet their observations were limited to naked-eye astronomy, calculating the paths of the planets. Nonetheless, the skies were darker before electricity so they could analyze the movement of planets in a lot more detail than the average person today. They correctly mapped to the day, the solar cycle, lunar cycle, the Venus cycle and the cycle of Mars.

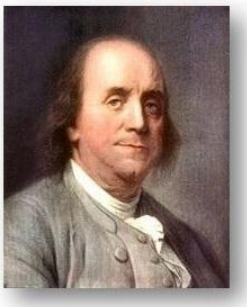
There are four long numbers on one of the walls representing 300,000-2.5 million days which seem to bring together the four astronomical cycles seen with the naked eye that the Maya thought important. This table contains hundreds of numbers relating to the Mayan calendar. This is the first time we have gotten to see the work of a scribe or official record keeper of the Maya community. There are clear references to the 260-day ceremonial calendar, the 365-day solar calendar, the 584-day cycle of the planet Venus and the 780-day cycle of Mars.

Based upon the new discovery of this dwelling we see that truly the Maya were the lords of time. They understood cycles and that everything moves in this manner from the beat of your heart to the rhythm when you dance. They did not see this cycle ending as the end of our earth or of our civilization. They saw it like a New Year's Eve party – say goodbye to the old and welcome the new. Not a period of doom and gloom, but of hope that we will finally see the change that may bring the final capitulation of the *Age of Political Corruption.*

Chapter X

Cycles of Time

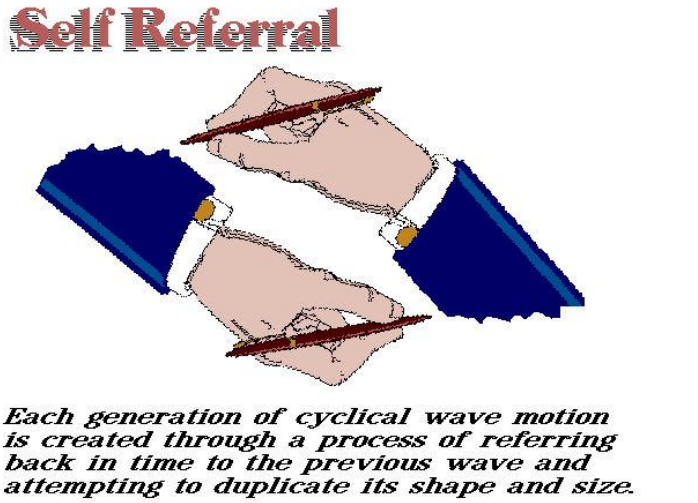
N Asian belief they see the world as going through great cycles of creative destruction, and both Hindu and Buddhist incorporate the idea if reincarnation into their faith. Perhaps to the surprise of most, many of the great minds in the West believed the same about reincarnation. **General George Patton** (1885–1945), who actually died on the Winter Solstice December 21, 1945, and **Benjamin Franklin** (1706-1790) both expressed their acceptance of the cyclical nature of life. Franklin wrote his own epitaph below:



Benjamin Franklin
(1706-1790)

The Body of B. Franklin Printer;
Like the Cover of an old Book,
Its Contents torn out,
And stript of its Lettering and Gilding,
Lies here, Food for Worms.
But the Work shall not be whlly lost:
For it will, as he believ'd, appear once more,
In a new & more perfect Edition,
Corrected and Amended
By the Author

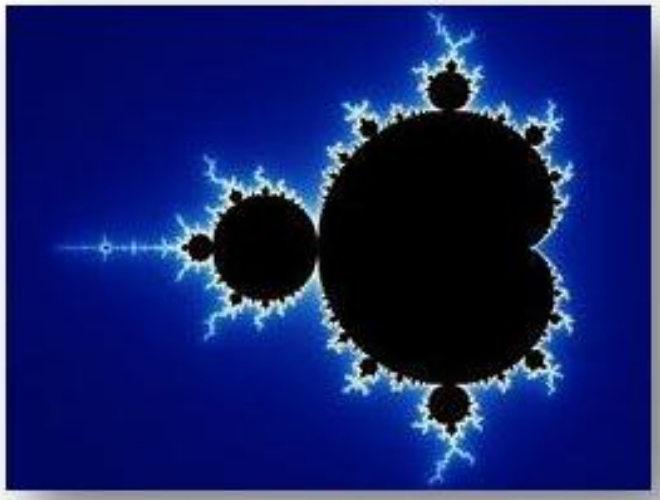
Some foresee that a natural disaster has to take place in order to establish the beginning and end of each of these cycles. Noah's flood being the end of the last cycle and this time it will be by fire. This apocalyptic dramatization has long captured the imagination of our culture. From a cyclical perspective, it makes sense that there would be a cycle of major climatic events with a cyclical duration of 6,000 to 7,000 years with a 1,000 year decline. Others have maintained that this is what the Bible really suggests when it states that: "God created the world in 6 days and on the 7th he rested" pointing to a passage that a day to the Lord is like a thousand years. No doubt, this is only the surface of the mystery that surrounds the apocalyptic question about 2012 and whether or not it predicts some natural disaster or the end of the world.



Each generation of cyclical wave motion is created through a process of referring back in time to the previous wave and attempting to duplicate its shape and size.

It appears that the entire universe in constructed on a basic structure of self-referral. In other words, just as a child is born and the model is a combination of both parent's genes. Hence, the child is a product of this process of self-referral. We see this structure in the composition of everything from the structure of an atom to the structure of our solar-system, galaxy, and then universe and perhaps beyond. Consequently, if this is the fundamental structure upon which everything functions, then it makes sense that a cycle of about 6,450 years exists. Since again this too would be the basic derivative of the 25,800 years for the Precession of the Equinoxes. If we apply this system of self-referral to everything around us it opens the door to our understanding the ebbs and flows in a much better manner. The similar structure in appearance from one level to the next is what is also known as the *fractal* nature of things. In other words, the same pattern appears at all levels and scales be it physical or even intangible subjects such as time.

Hence, there should be a higher level measured in thousands of years the same as there are such frequencies in much smaller "time" scales. For example, studies of the ice core samples from the North Pole establish there is a 300 year cycle in the output of the sun energy. If we now assume that there is an even larger cycle of energy within the sun, then keeping with the *fractal* structure, the next *fractal* interval should be 1,857 years (6 x 309.6).



Mandelbrot Set

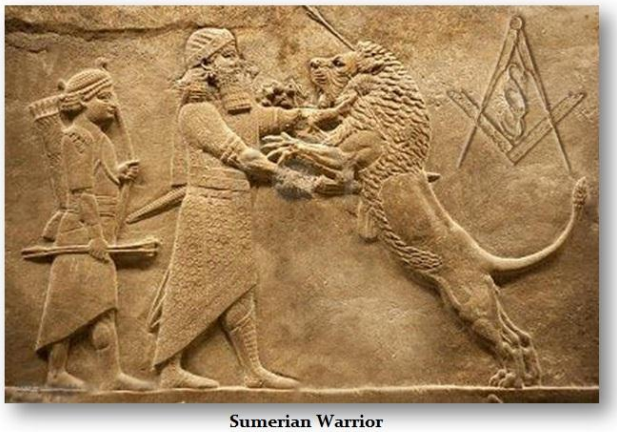
Another aspect of the investigations regarding cycles of time has been where does a cycle, like a circle, begin and where does it end? Measuring time itself has indeed been varied. It was the Romans who began to use the beginning of a day at the midnight point. The Jews, Babylonians, and Greeks counted a day from sunset to sunset. The Greek sun god, *Helios*, is pictured below with sun rays emitting from his head. This imagery was the basis of the design for the Statue of Liberty.

The Egyptians and Hindus began their cycle of a day at the sunrise. The Teutons or *Teutones,* an ancient Germanic tribe noted by the Greeks and Romans, counted nights grouping them into 14 day periods giving rise to the English term "fortnight". The English word "penny" also comes from the German coin named a "pfennig", which was the equivalent of a denarius, denier, and denaro.

Helios - Greek Sun God

The Babylonians delineated time during the day by taking the daylight period and divided it into periods known as "watches". This method still survives today in the military in what we call a guard "taking a watch". This was not a fixed calculation like an hour

is but expanded in the summer and contracted in winter along with the sunlight. Similar to what we do with daylight savings time during the summer in the United States. In ancient times this is how time was managed by pretty much every organized civilization. The practice of 24 periods to a day evenly divided (2 x 12) is what was called the "civil" reckoning used by the Greek, Sumerian, Babylonian and Roman common folk. The Babylonians had the astronomical day divided differently as even the Catholic Church had canonical time - 7 hrs. It may be surprising, but just as the use of computers forced the Japanese to create a second alphabet to be able to use a key board, it was the invention of mechanical clocks during the 13th century that led to the standardized period of an hour.



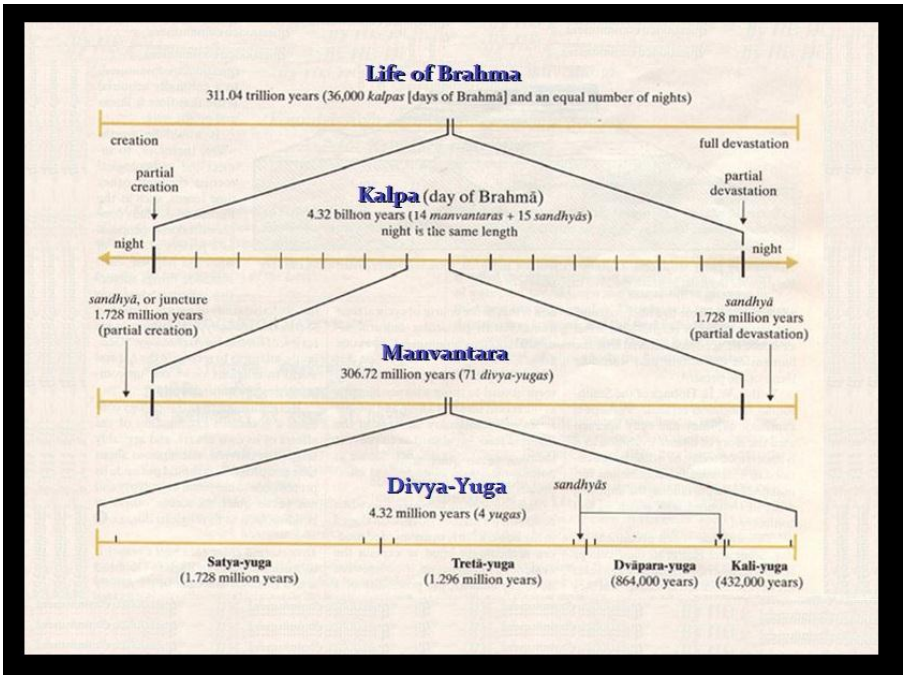
Sumerian Warrior

Much of the math that we use today, in regard to measuring time, was established during the 3rd millennium BC by the ancient Sumerians. Their system greatly influenced the Babylonians in using the sexagesimal (base 60) method of calculating. The Sumerian method was based on gradations of the number 60 (5 x 12 = 60) rather than a decimal system based on the number 10 (ten). The Babylonians took this system and created 3 major “watches” for each day. It was the number 3 (three) that in early ancient times represented their understanding of *Pi* (π). These 3 major watches were then further divided into half and quarter periods. It is from the ancient Babylonians that we still use 60 seconds in a minute, 60 minutes in an hour, and 360 degrees in a circle.

The concept of calculating a month appears to come from counting the moons rather than the days. Further delineation of time appeared to be required and thus we find Egypt had a 10 day (week), Assyrians used a 5 day period (week) that also seems to have been applied in Asia. And the Romans used an 8 day week. In Babylon, they preferred the lunation cycle of 7 as it was also a religious number to them in Babylon. Thus over time the four 7 day phases of the moon won out and the delineation of 7 days equals our modern week.

Any discussion of Eastern philosophy would be incomplete without noting the Hindu theory of world cycles that further illustrate the East/West divide in thinking. Again Hindu theory is cyclically based rather than the linear approach applied in the West or European culture. To the Hindu the Brahma is the creator god and in more traditional Hindu scriptures history is viewed to be cyclical in character, with extraordinary repeating series of ages. Each age has it's own particular qualities, as we see the same general thinking process in the Maya.

The Traditional Hindu *Puranic* Model describes a fractal structure of cycles within cycles. In depth discussions of these cycles can become confusing to those in the West. This is because we are not unaccustomed to dealing with a fractal structure regardless of the subject matter under consideration. These different cycles are assessed and then calculated in different types of units. For example, the cycles are often described in units of "deva" years, each of which equals 360 human years. Let us begin with the smaller cycles and work our way up to the larger ones. The length of each cycle is given in ordinary human (earth) years, as well other units where it may be appropriate.



The smallest cycle is called a *Maha Yuga* and is 4,320,000 human years. Each Maha Yuga is subdivided into the following four ages, whose lengths follow a ratio of 4:3:2:1:, the first age being the *Satya Yuga***.** Also known as the *Krita Yuga*, it is said to be the Golden Age or age of Truth, and is calculated as 1,728,000 human years. The second age is known as the *Treta Yuga*, also known as the Silver Age, which has a full duration of 1,296,000 human years. The *Dvapara Yuga* is the third age accounting for 864,000 human years, also known as the Bronze Age. The fourth and final age is the *Kali Yuga* with a full duration of 432,000 human years, and known as

the Iron Age. This is the age in which we are presently living. Toward the end of a *Kali Yuga,* it is said various calamities cause a massive of destruction.

Defining a *Brahma Day* is interesting because of the structured numbers 4.32 (half 8.64) and 72 which reflect the hint of a fractal nature. It is not so much the names of all of these levels and structure inasmuch as it is the mathematical relationship between them. A *kalpa* is a single daytime period in the life of Brahma, the creator god. Two kalpas are a day and a night of Brahma. Each kalpa is composed of 1,000 Maha Yugas. A kalpa is thus equal to 4.32 billion human years. A year of Brahma is composed of 360 day/night cycles of Brahma, or 720 kalpas, or 8.64 billion human years. The lifespan of Brahma is 100 Brahma years, or 72,000 kalpas, or 311.04 trillion human years. This is where we find the belief and rules of reincarnation taking place at the end of Brahma's daytime period where there is a temporary dissolving (*pralaya*). This is when the Three Worlds (*Bhuloka, Bhuvarloka, Swarloka*) and the seven underworlds (the *nagas*) are temporarily dissolved. At the end of the life of Brahma, all worlds are completely dissolved (*mahapralaya*), and no one is reincarnated from these worlds ever again.

The *Vishnu Purana* states that at the end of the daytime period of Brahma, a dreadful drought occurs that lasts 100 years. The sun changes into seven (7) suns, and the three worlds (Bhurloka or Earth, Bhuvarloka or the lowest heaven, and Svarloka or the next higher heaven) and the underworlds are burned bare of life. All inhabitants of Bhuvarloka and Svarkloka flee to the next higher heaven, *Maharloka*, to escape the heat; and then on to the next higher heaven which is, *Janaloka*. This is revealing a clearly defined fractal structure.

Enormous clouds form and the three worlds are entirely flooded with water. The lord *Vishnu* reposes on the waters in meditative rest for another whole kalpa (4.32 billion years) before renewing the creation. The destruction that takes place at the end of a Brahma daytime, *naimittika*, is purely occasional. The characteristic of this destruction is that the three worlds continue to exist but are made uninhabitable. The souls of individuals however, still exist, but they will not be reincarnated until the next Brahma daytime.

While this who process of reincarnating the world may sound confusing, just looking at the numbers, reveal a neat ordered structure that is fractal with the same numbers present at different levels. One cycle that overlaps the others is that of *Manvantaras,* each kalpa is presided over by a succession of 14 *Manus*, and the reign of each Manu is called a Manvantara. A single Manvantara is approximately 71 Maha Yugas (4,320,000 x 71 = 306,720,000 human years).

Clearly describing a Noah-like event *Coomaraswamy* states:

> *"Each Manvantara is followed by a Deluge, which destroys the existing continents and swallows up all living beings, except the few who are preserved for the repeopling (repopulation) of the earth."*

Currenly we are in the 51st Brahma year within the Brahma lifetime, within that we are in the first Brahma day, called the *Varaha kalpa*. Within that Brahma day, we are in the 7th Manvantara, and in the 28th Maha Yuga of that Manvantara. This would place us at about the 454th Maha Yuga of the 1,000 Maha Yugas that comprise this Brahma day. Within this Maha Yuga***,*** we are in Kali Yuga***.*** The 5100th year of Kali Yuga corresponds to the year 2,000 AD. That means that we are fairly early in Kali Yuga and this age will continue more than 426,000 more years. Hence, this does not symbolize a doomsday prophecy for 2012 either.

There are some Hindu teachers who disagree and offer a slightly different structure. Nonetheless, for the purposes of this discussion, we will stick to the Traditional Puranic Model. Sri Yukteswar In the introduction to his book The Holy Science, Sri Yukteswar describes an fascinating variant of the Hindu theory of ages. When we examine this structure mathematically, it appears it is describing a similar Precession of the Equinoxes and the existence of ***Pi (π).***

According to Sri Yukteswar, our solar system takes some star and revolves around it in about 24,000 human years causing a retrograde (backward movement) of the equinoctial points around the zodiac. The sun also simultaneously revolves around a grand center of the universe known as the ***Vishnunabhi***, which is the seat of the creative power, or the Brahma. This is a place of universal magnetism that keeps everything in place.

Yukteswar further explains that the sun's 24,000 year cycle around its companion star takes the sun progressively closer, and then progressively further away from the mystic center ***Vishnunabhi***. The cycle of yugas takes place twice within each 24,000 year cycle. As the sun recedes from ***Vishnunabhi***, the ages pass in the usual order: ***Satya, Treta, Dvapara, Kali***. As the sun approaches ***Vishnunabhi***, the ages pass in the opposite order: ***Kali, Dvapara, Treta, Satya***.

The length of the ***Yugas*** is: ***Satya Yuga***, 4800 years; ***Treta Yuga***, 3600 years; ***Dwapara Yuga***, 2400 years; and ***Kali Yuga***, 1200 years. The ***Yugas*** during the approach to ***Vishnunabhi*** he calls 'ascending' ***Yugas***; those during the retreat from ***Vishnunabhi*** he calls 'descending' ***Yugas***. The most recent ascending ***Kali Yuga*** began in 499 AD. Since 1599 AD, we have been in the ascending ***Dwapara Yuga***, with consequent advances in human culture and knowledge.

Yukteswar argues that the Hindu almanacs, which correspond to the traditional ***Puranic*** model, are in error, which took place during the dark years of ***Kali Yuga.*** It was during this period when

he argues that the scholars misinterpreted the scriptures. Yukteswar maintains that we are by no means in a ***Kali Yuga*** at this time. Hence, under his interpretation a cycle of four ***Yugas*** takes 24,000 years instead of 4,320,000. Furthermore, there is a pattern of a oscillation (cycle) whereby the ***Yugas*** alternate between ascending and descending trends instead of always proceeding in the same order. He does not mention the grander cycles like ***kalpas, manvantars***, and lifespan of ***Brahma*** go unmentioned.

Paramahansa Yogananda was a disciple of **Sri Yukteswar** (1855-1936) and endorses Yukteswar's theory of world cycles. In a footnote he states we are currently in a world-age within the Kali Yuga of a much greater universal cycle than the simple 24,000 year cycle. The universal cycle of the scriptures of 4,300,560,000 years, is defined as one *Day of Creation*. This vast figure is based on the relationship between the length of the solar year and a multiple of Pi (π 3.1416). The life span for a whole universe according to the ancient seers is 314,159,000,000,000 solar years, or "One Age of Brahma."

Yukteswar argues that there is an error in the Hindu almanacs though because the length of the Yugas were misinterpreted by scholars as being counted in units of "deva years" which are much longer in duration. This mistake led the scholars to believe that the Yugas are much longer than they truly were. With respect to the universal cycle, he goes on to state that a Day of Creation is 4,300,560,000 years, which differs slightly from the traditional number 4,320,000,000 years. Nevertheless, this is still a derivative of Pi (π) that we will look at more closely further on. He also differs from the 311,040,000,000,000 years life of Brahma where he lives effectively a derivative of Pi (π) 314,159,000,000,000 years.

There are numerous other interpretations that differ as well. Obviously, there is no actual scientific proof for the Hindu theory of world cycles. It is not important regarding the numbers insofar as they extend such vast time frames. What is important is the fractal structure, the base numbers and the derivative of *Pi* (*π* 3.1416). For the purposes of this discussion, we can see the idea of cycles and the overall structure of cycles within cycles with also overlapping cycles is still a fundamental structural design similar to that of the Maya and the derivative of the Asian philosophy of the cyclical nature or time.

Chapter XI

The Mayan CALENDAR

The Mayan calendar is one of the most interesting dynamic cyclical structures ever created. It appears to be a blending of cycles of planets, the moon, and the solar influences governing life here on earth. In Western culture there tended to be just one aspect employed either the lunar cycle or the solar cycle. The Maya blended these influences in a very interesting way that is quite unique. However, they were not the originators of this calendar. As we will explore, the documented evidence suggests that the Maya improved upon the work of older civilizations. They were not the originators.

The Maya introduced a very unique use of two primary calendars capturing both aspects of the solar and most likely an agricultural ritual calendar impacting human life. This development was truly ingenious. The Maya created a system of Almanacs and Calendars. Each Calendar interlocks and

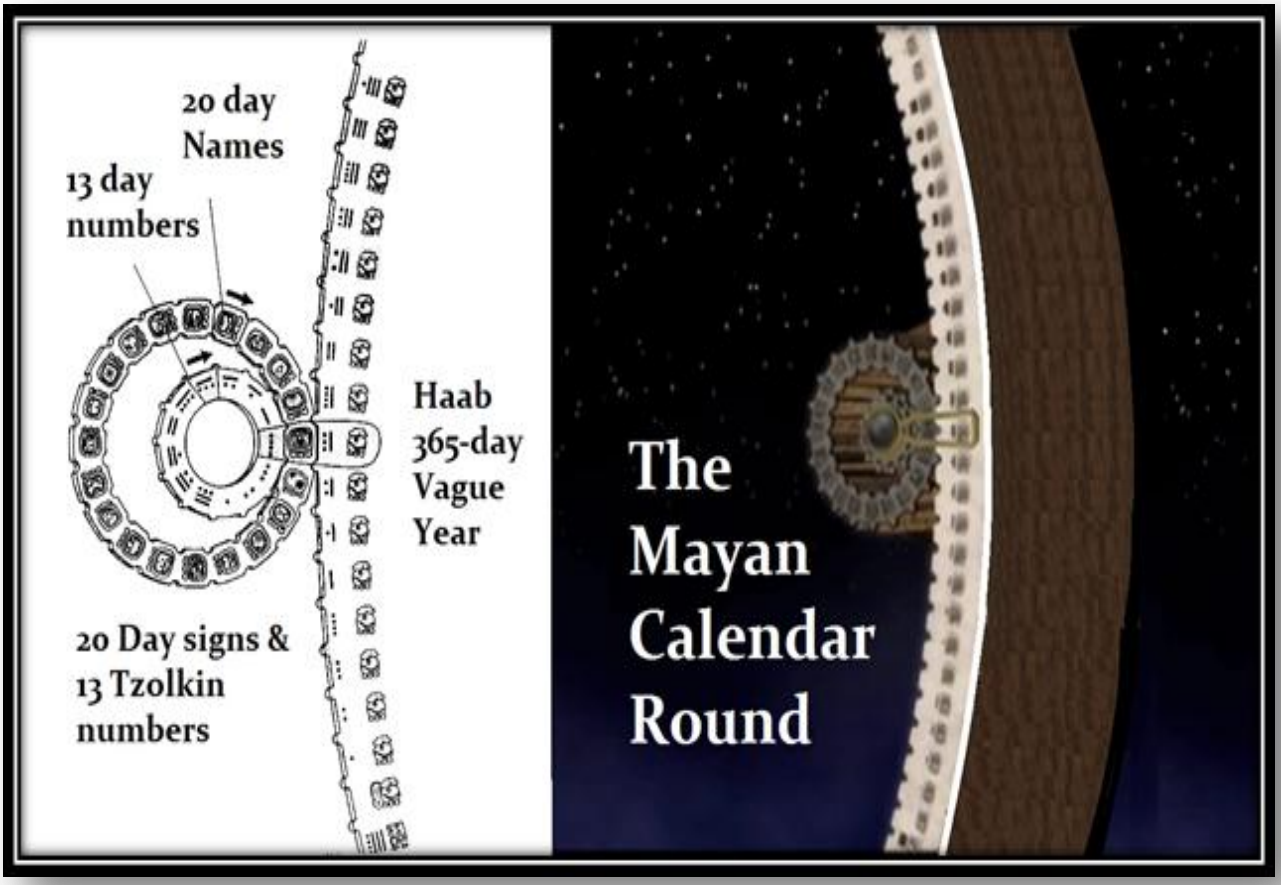
The Caracol building in Chichén Itza

synchronizes like the inside of a watch, with combination cycles that create more cycles and every cycle has a meaning.

The Mayans were clearly deeply fascinated by their observations of the heavens. They were obviously captivated by their quest for understanding the cycles of celestial bodies, particularly the Sun, the Moon and Venus. This enthrallment led them to accumulate a very large set of highly accurate observations. An important aspect of their cosmology was the search for major cycles, in which the position of several objects repeated. It was this interest that led them to see the world in a view of grand cycles. They observed that what was would indeed be again like the Sun rises every morning in a repetitive pattern. The Romans termed this ***Sol Invictus***, meaning that the Sun was invincible and always returned each morning irrespective of the political changes on earth.

The Mayans carried out astronomical measurements with remarkable accuracy yet they had no instruments other than sticks. They used two sticks in the form of a cross, viewing astronomical objects through the right angle formed by the sticks. The ***Caracol*** building in *Chichén Itza* is

thought by many to be a Mayan observatory. Many of the windows of the building are positioned to line up with significant lines of sight such as that of the setting sun on the spring equinox of 21 March and also certain lines of sight relating to the moon.



Again, the Mayan calendar is clearly an Eastern based system steeped in dynamic cyclical structure. It is this feature of the Mayan calendar that tends to link the ideas much more toward the Asian thought process rather than that of Western European. This further tends to support the idea of some sort of connection of cultures perhaps through the Pacific involving trade. Even in the West, when Rome overthrew its Tarquin king in 509BC starting the Republic, that idea spread through trade connections and we see Democracy is born in Athens within less than one year – 508BC.

The first calendar we will discuss is an agricultural ritual calendar, known as the ***Tzolkin*** (**Tzol "order" and K'in "day"**) that was composed of 260-days. It contained 13 *"months"* of 20 days each. The months were named after 13 gods while the twenty days were numbered from 0 to 19. **"Tzolk'in"** or Master Calendar is the oldest one. It is an energy tracking device that describes the energies of

Creation, projects cycles within cycles, in it, each day is unique, each person is unique, and each era is unique. This is the calendar that was used by the Priests when a child was born. The calendar was used to decide the ***n'awal*** that the child would have. This is the spirit, or the "*job on earth that had to be accomplished*", their element and their positive and negative aspects. Depending on the date and time of the birth, it was decided the future aptitudes that the child would have to accomplish his/her place on Earth. This is similar to astrology that began also within the eastern belief systems.

The second calendar was a 365-day civil calendar called the ***Haab***. This is the solar based calendar. This calendar consisted of 18 months, named after agricultural or religious events, each with 20 days (again numbered 0 to 19) and a short "month" of only 5 days that was called the ***Wayeb***. The ***Wayeb*** was considered an unlucky period and **Diego de Landa Calderón** (1524–1579) wrote in his classic text that the Maya did not wash, comb their hair or do any hard work during these five days. Anyone born during these days would have bad luck and remain poor and unhappy all their lives. However, in reality, the Maya actually used three different calendars. The third was the ***Long Count***, which counted days since a mythical beginning of time and also included the other two.

The "***Long Count***" is clearly cyclical and not linear. The ***Long Count*** was used by the Maya to document past and future events. Their other calendars were simply too short to document any date beyond 52-years. The 52-year calendar, known as the ***"Calendar Round",*** was used as it spans a generation, or the approximate lifetime of an individual. Using the ***Calendar Round*** meant that events in a person's life could be chronicled over 52-years, which was the duration of the ***"Haab"*** or 18,980 unique days. However, if the object was to keep notes regarding historical events beyond 52-years, this is where the ***Long Count*** came into play.

The ***"Long Count"*** system of counting days was based on several units or periods of increasingly larger size. This was the ***k'in*** (1 day), ***winal*** (20 days), ***tun*** (360 days), ***k'atun*** (7200 days), and ***bak'tun*** (144,000 days) and 13 ***b'ak'tuns*** would be one cycle, giving us 5,126 years per cycle. The ancient Mesoamericans kept track of time using this system, which was combined with additional counts of 260-days (the ***tzolk'in***) and 365 days (the haab) to produce ***Long Count*** dates. There is what has been referred to as the ***"Great Cycle"*** of 13 ***bak'tuns*** (1,872,000 days) that has been determined to have begun on ***13.0.0.0.0 4 Ajaw 8 Cumk'u*** (*that is 13* ***bak'tunob****, 0* ***k'atunob****, 0* ***tunob****, 0* ***winalob****, and 0* ***k'inob,*** *followed by counts on the* ***tzolk'in*** *and* ***haab***). This was an absolute timescale with a creation date and time that has been determined to be the 12th of August, 3114 BC. This is the cycle that has been purported to end on ***13.0.0.0.0 4 Ajaw 3 K'ank'in,*** which is December 21, 2012 (or possibly December 23).

The Mystery of the 260 Day Calendar

Our first to review will be the agricultural-ritual calendar of 260-days. Why then was the agricultural ritual calendar based on 260-days? This is a question to which we have no satisfactory answer. One suggestion is that since the Maya lived in the tropics the sun was directly overhead twice every year. Perhaps they measured 260-days as the agricultural cycle and 105 days of winter. Professor Vincent Malmström published a paper in Science back in 1973 where he proposed an answer to the mysterious (and still controversial) question: ***Why did the Maya use a 260-day calendar?*** In Malmström's 1997 book ***Cycles of the Sun, Mysteries of the Moon***, which he has He argued geography, religion, culture, computation, science, and human foibles combined to result in this cycle. Why? Thompson did not believe there was any astronomical basis for the 260-day calendar. Malmström assumed there had to be some astronomical basis for its use.

Malmström discovered that in that region, there was a 260-day astronomical cycle. It turns out that at latitude 14.8 º N, the sun is directly overhead on August 13 passing southward, and again on April 30 passing northward, an interval of 260-days. August 13 is also the day after the peak of the Perseid meteor shower. Thompson argued that the interval between zenithal sun positions that there is a 260-day interval between autumn and spring zenithal transits of the sun at that latitude, but there was also a 105-day interval between the spring and autumn positions. Therefore, I have attributed to this the more practical interpretation to the 260-days between the autumn and spring. I call this the agricultural cycle that governs winter's duration,

Zapotec - Monte Alban

The Zapotec origins are traced all the way back into the Pre-Classic Period (1600 BC) in the state of Oaxaca, Mexico to the prehistoric city of San Jose el Mogote. In 500 BC Zapotec people established a spectacular city known as Monte Alban which became their Classic Period center until 700AD. It was during the Classic Period Monte Alban where we see international trade development with the Teotihuacan to the north as well as the Bonampak and Tikal in the south. Eventually the Mixtec took control of the area and combined their culture with the Zapotec at cities like Mitla. By the time of the Post Classic, after 1000AD, the Toltec and Aztecs rose to power with the Zapotec as a subject nation of their empire.

Nevertheless, we find an inscription from the Zapotec region of Mont Alban, in the highlands of central Oaxaca on the San José Mogote monument, dates between 700 and 500 BC, which is the oldest evidence known for the existence of a 260-day calendar *(Marcus, Joyce; 1980 Zapotec Writing - Scientific American 242: 49)*. The San José Mogote monument depicts a nude man, presumably a captive, with two glyphs between his feet that have been interpreted as a day name in the Zapotec 260-day calendar. The 260-day calendar is still in use today in the highland region of Guatemala *(Aveni, A. F.; 1980 Skywatchers of Ancient Mexico. - University of Texas press, Austin.1980: 148).*

Zapotec culture has always been distinguished by the power and equality enjoyed by women. This may possibly be also a reason behind the 260-day cycle, since this also corresponds to the human gestation period of approximately 9 months. The respect for women may have been behind expressing the power of this cycle as governing the unfolding of creation! There is no evidence of that and this may be idle speculation. Nonetheless, with the 260-day cycle one could argue is the biological and agricultural cycle. This period of 9 months may not have been a mere coincidence to the Zapotec. Then there are four 65-day cycles within a 260-day cycle and the half cycle is 130-days.

This now begin to get interesting for clearly the view of **TIME** was nonlinear. If we take the two calendars, one with 260-days and the other with 365-days, we arrive at the point of origin once every 52-years (260 x 365 = 18980 days). This 52-year cycle strangely corresponds to the orbit of Sirius B around Sirius A. This now gives us the 52 civil years and 73 ritual years. Additionally, the Mayan Ritual year of 260-days strangely provides the precise solar year as well for after a cycle lasting 59 Ritual years, the tropical year and the Ritual year lock together in step. A period of 59 intervals of 260-days equals a period of 42 tropical years, of 365.242 days. This 260-day calendar is interesting for it is more than just 42 solar years (59 x 260), it is also 405 Lunar Month (46 x 260), 61 Venus Years (137 x 260), 1 Mars Year (3 x 260), 88 Jupiter Years (135 x 260), and it is close to the ***Precession of the Equinoxes***, which is 25,800 years (100 x 260). It is possible that the practice of sky watching in Mesoamerica extends back so far, based upon the Zapotec inscription of 700-500BC, that the 260-day calendar was the result of this correlation.

Of course, then there is the theory is that the Maya had 13 gods of the *"upper world"*, and 20 was the number of a man, so giving each god a 20 day month gave a ritual calendar of 260-days. Another major theory in the creation of the 260-day calendar was the planet Venus. The Mayan astronomers calculated its synodic period (after which it has returned to the same position) as 584 days. Now after only two of the 52-years cycles Venus will have made 65 revolutions and also be back to the same position. This remarkable coincidence would have meant great celebrations by the Maya every 104 years. What is clear is they were definitely sky-watchers. The Maya appear to have built upon the older civilizations and their discovery is not purely their own device.

Mayan Months

There are yet additional strange correlations with other cultures regarding the 260-day cycle. The traditional Jewish lunar/solar calendar measures differences between the moon and sun to interpolate about 209-days over 19-years. Some 7-months are added to catch up the lunar-side with the solar-side of the Jewish calendar. The Mesoamericans adapted similar reasoning for a 20-year lunar/solar cycle and embedded the extra 210-days using an entirely different method.

The Mayan 52-year ***Calendar Round*** accomplishes the required intercalary time with a dual year system. The Mayan 260-day ***Tzolken-sacred-year*** was part of a 365-day ***Haab-solar-year***. Alongside the 260-day ***Tzolken-sacred-year***, a 360-day ***Tun-year*** kept track of civil functions. The 360-day ***Tun-year*** marked the approximate middle point between 12 lunar-months or 354-days, and the 365-day ***Haab-solar-year***. Following the 260-day ***Tzolken-sacred-year***, 105-days more were included to finish the 365-day ***Haab-solar-year***. Sister cultures such as the Inca and Aztec used an identical system of counting.

Mayan astronomer-priests were very good at calculating multiples of days and years. Mayans purposely addressed a 360-day ***Tun-civil-year*** with prefixes in order to lengthen the calendar. Prefixes are the "Katun" that describes 20-***Tun-years*** and the "***Baktun***", meaning 400-***Tun-years***. They multiplied the 20-year lunar/solar cycle by 20-years again, thus squaring time. Multiples of lunar/solar 20-year cycles occur in the form of 20-year ***Katun-cycles*** and 400-year ***Baktun-cycles***. Mesoamerican chronologists accept the 400-year ***Baktun-cycle*** was an integral part of the Mayan calendar system.

The 365-day ***Haab-year*** and 260-day ***Tzolken-sacred-year*** combine to form the Sun Kingdoms' 52-year ***Calendar Round***. The 52-year chronological summit was the cornerstone of the dual calendar system. A complete ***Calendar Round*** repeated after 18,980-days. The 52-year ***Calendar Round*** (***Tun-civil-years***) multiplied by 360-days yields (52 x 360) 18,720-days. The 72-***Tzolken-sacred-years*** of 260-days yields (72 x 260) 18,720-days. The last five special holidays are the ***Wayeb***, which accrues every year separately adding the final 260-days in the ***Calendar Round***. One extra 260-day ***Tzolken-sacred-year*** adds to ***72-sacred-years*** for 73-***Tzolken-sacred-years***. Multiplying 73-***Tzolken-sacred-years*** by 260-days per sacred-year yields the equivalent of 18,980-days for a 52-year ***Calendar Round***. The 52-year Calendar Round equals 73-***Tzolken-sacred-years*** and both equal 18,980-days. The total 52-year ***Calendar Round*** is 18,980-days. By this calendar system, only once in every 52-year intervals would any day of the 260-day

Tzolken-sacred-year coincide with any day of the 360-day ***Tun-civil-year***. A complete 52-year ***Calendar Round*** would then restart again the next dual sequence. Names for gods and their particular meanings often varied across the cultures. However, the calendar math remained the same.

We insert a fact from the ***Book of Enoch***. Some ancient Jewish sects were using a 364-day calendar year. Information gained from the ***Dead Sea Scrolls*** and the three ***Book(s) of Enoch*** support the idea of numerical matching. This concept says X-number of days numerically match the same X number of years. A bridge forms between X-days and X-years, where X describes any number of days and years. The Mayan 260-year ***Tzolken-sacred-cycle*** and the 105-year portion provide yet another interesting aspect of time.

All lunar/solar calendars are the product of prevailing culture. On the other side of the world, Mesopotamian scribes were recording Mayan calendar math in what we now call the Holy Bible. They were doubling and dividing calendar time with astonishing accuracy. The 260-day ***Tzolken-sacred-year*** numerically matches a 260-year ***Tzolken-sacred-cycle***. A 365-day ***Haab-solar-year*** numerically matches with 365-years in a ***Haab-solar-cycle***. The 360-day ***Tun-year*** likewise matches a 360-year ***Tun-cycle***.

Genesis 5:3

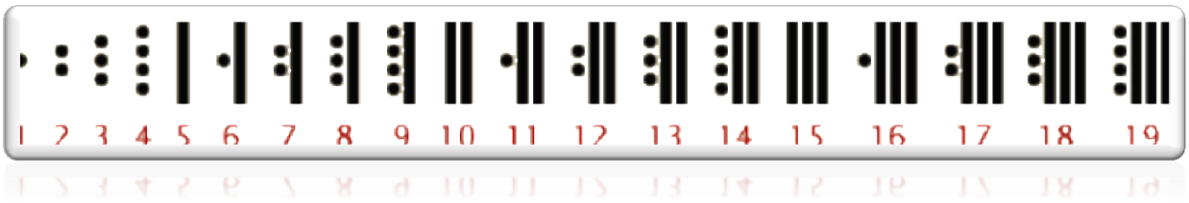
> ***"And Adam lived an hundred and thirty years, and begat a son in his own likeness, after his image; and called his name Seth:" (KJV)***

Early Bible writers simply divided the 260-year ***Tzolken-sacred-cycle*** in half to get the 130-year age of Adam. A few verses later, we have the principle calendar instrument of the Mayans, the 105-year age of Seth. Lunar/solar calendars distinguish between lunar-side times and solar-side times. The lunar/solar calendar effectively “time-split” 210-years into equal halves, a 105-year lunar-side time split and the opposite 105-year solar-side time split.

Genesis 5:6

"And Seth lived an hundred and five years, and begat Enos:" (KJV)

The 260-day-Tzolken-sacred-year divides for two halves, each with 130-days. The 260-year-Tzolken-sacred-cycle also divides for two identical 130-year portions. Regarding the 365-day-solar-year, 105-days remain and for the 365-year-solar-cycle, 105-years remain.



In all of these discussions about the Maya, little attention has been paid by those eager to claim the Maya predicted the end of the world to older civilizations. Overlooked have been the Zapotec. Like other Mesoamerican scripts, Zapotec used the ***bar-and-dot*** notation to represent numbers. In terms of time-keeping, the Zapotecs employed the 365-day solar calendar (called **yza**) and the 260-day sacred calendar (called **piye**).

A brief explanation of the sacred calendar can be visualized as two interlocked cycles of 20 "day signs" and 13 numbers or "coefficients". The two cycles move in parallel, so a day with the 1st day sign and coefficient 1 will be followed by a day with the 2nd day sign and coefficient 2.

The following is a list of day signs in the **piye**. However, even the list of days in the **piye** is controversial, as nearly every published paper presents a different list. Presented here is that published by Javier Urcird (2000).

Another cycle of time recorded on Zapotec texts is the 52-year ***Calendar Round*** cycle that interlocks the solar and sacred calendars. A year in the ***Calendar Round*** is identified by the date in the sacred calendar that corresponds to the first day in the solar year. Because of the way the mathematics works out, only four day signs in the **piye** can occur on the first day of the solar year. These four day signs are called *"year bearers"* because they *"bear"* the burden of the year. To graphically distinguish ***Calendar Round*** years from days in the **piye**, a special glyph in the shape of a headdress or crown is placed above the year bearer. The four year bearers are laa (lightning), china (deer), piya (soap plant), and xoo (earthquake).

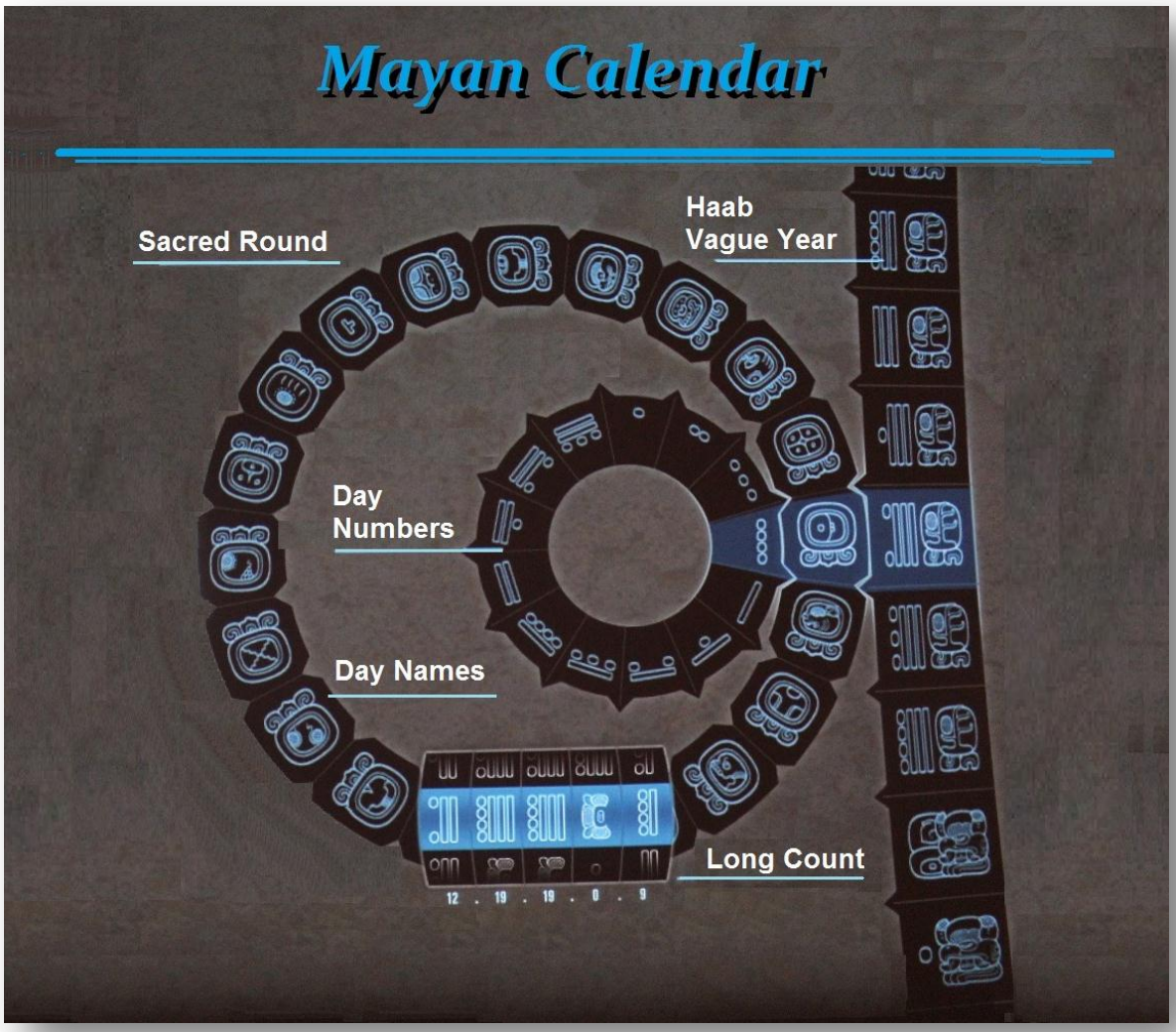
It is not known if the Zapotecs counted time in other calendrical cycles such as the solar calendar or *"weeks"* of 13 days called trecenas. Because the coefficients of the **piye** can only go up to 13, any glyph compound with a numeral higher than 13 can potentially be a day in a solar month, a solar month, or a trecena. One glyph, known as the glyph W due to its similarity to the letter, not only accompany numbers larger than 13 but also occur near Calendar Round and piye dates. However, mathematical simulation has shown that glyph W cannot form part of any of these three possibilities. Glyph W definitely plays a time-keeping role, but right now it's an enigma.

Unlike later Mixtec and Aztec scripts, Zapotec was much more textual, possibly capable of representing sentences. Zapotec very well could be a logo-syllabic writing system since its inception, ca 600BC. It may not be as extensively phonetic as Epi-Olmec or Maya. For instance,

Zapotec hieroglyphic writing by Javier Urcid (2000 ed)

the number of non-calendrical glyphs range between 80 to 90, making it possible that Zapotec contained a mixture of logograms and phonograms. Also, the way signs are joined into compounds might indicate affixes, possibly spelled out phonetically, attached to a root logogram to form a noun or verb phrase. Some tantalizing clues come from Javier Urcid, Associate Professor of Anthropology at Brandeis University, whose studies have shown that possible instances of homophonic principle, or "rebus writing", are used in naming personages.

Urcid has maintained that one of the earliest and most enduring scribal traditions in Mesoamerica developed in the central valleys of Oaxaca. Through time, the script spread over a wide portion of southwestern Mesoamerica. The script in developed in a course that minimized phoneticism and maximized logo-phonic, semantic, and hence multilingual encoding. After some 1,500 years of use, the political collapse of the urban center of Monte Alban, the script was gradually replaced no later than the 10th century AD by another form of writing which-although mostly unknown-must have eventually become the widespread phonic script known as "Mixteca-Puebla" (1250-1550 AD). It was between the 4th and 8th centuries AD, that this script had become one of several technologies that evolved to enable communication.



The Maya ***Long Calendar*** system is one of the most noteworthy intellectual achievements of this advanced civilization. The ***Long Calendar*** is formed with 3 interlocking cycles of 365-years; one of the interlocking circles has names, and the other has numbers lining up. Every 52-years the 3 cycles will meet again and then, the cycle starts again. The Magic Number is "52" as determined from the ***Dresden Codex*****.**

The ***Long Calendar*** is the third way that the Mayan people had of measuring time yet it was not strictly a calendar. It was an absolute timescale which was based on a creation date and time was measured forward from this historic date. What date was the Mayan creation date? The date most often taken is 12 August 3114BC but we should say straightaway that not all historians agree that this was the zero of this so-called ***"Long Count"***.

The ***Long Count's*** start date was written, in its full form, like this: ***0.0.0.0.0, 4 Ahau 8, Cumku.*** The first five digits measure days in units of 144,000, 7,200, 360, 20, and 1. The ***4 Ahau*** is a ***Tzolkin*** day, based on a cycle of 13 numbers with a cycle of 20 days names whereas then ***8 Cumku*** is a ***Haab'*** day, based upon 18 20-day month intervals.

There has, evidently, been some debate and confusion giving rise to a controversy concerning the mythical start date whether it was 584,283 or 584,284 or 584,285 days ago. Thompson originally believed it was 584,285. However, he then changed his mind and decided on 584,283. Malmström expressed he preferred the ***Long Count*** start date of 584,285 days, which fixes the start date as August 13, 3114BC.

Now one might expect that this measurement of time would either give the number of ritual calendar years since creation or the number of civil calendar years since creation. However it does neither. The ***Long Count*** is based on a year of 360 days, or perhaps it is more accurate to say that it is just a count of days with then numbers represented in the Mayan number system. Now we see the probable reason for the departure of the number system from a true base 20-system. It was so that the system approximately represented years. Many inscriptions are found in the Mayan towns which give the date of erection in terms of this ***Long Count***.

We should note some aspects of the Mayan number system. The Mayans appear to have had no concept of a fraction yet were still able to make remarkably accurate astronomical measurements. Also since the Mayan numbers were not a true positional base 20 system, it fails to have the nice mathematical properties that we expect of a positional system. For example here we have a classic example: **[9;8;9;13;0] = 0 + 13 × 20 + 9 × 18 × 20 + 8 × 18 × 20^2 + 9 × 18 × 20^3 = 1357100.** However, if we move all the numbers one place left, this should multiply the number by 20 if this were a true base 20 positional system. Instead, **20 × 67873 = 1357460,** and this by no means equals the actual result **1357100 – [9;8;9;13] = 13 + 9 × 20 + 8 × 18 × 20 + 9 × 18 × 20^2 = 67873.** When we actually multiply **[9;8;9;13]** by 20 we get **9 × 400** whereas **[9;8;9;13;0]** we obtain **9 × 360**.

The other fascinating aspect of the Mayan mathematics is that they appear no to have methods of multiplication for their numbers. They also did not use division of numbers. Still, the Mayan numeric system is positively capable of being used for such functions of multiplication and division.

The Maya may have had crude instruments, nevertheless, they were able to calculate the length of the year to be 365.242 days which is incredibly accurate compared to our modern calculation value of 365.242198 days. They also were capable of accomplishing remarkable calculations regarding the length of the lunar month. The Mayan astronomers discovered that 149 lunar months lasted 4400 days. This gives 29.5302 days as the length of the lunar month. The value we use today is 29.53059 days.

Ptolemy III Eurgettes (246-221 BC)
with his wife/sister Berenike II

The Egyptians used the fixed star Sirus and its precession to determine their calendar. They found that Sirus moved exactly one day ahead every 4 years enabling them to calculate the year as 365.25 days. This concept was clarified by **Ptolemy III Eurgettes** (246-221 BC), who was married to sister Berenike II. He revised the Egyptian calendar recognizing the duration of the year was really 365 days. He then created a leap-year every 4 years, decreeing in 238BC-

> *"Since the Star [Sirius] advances one day every four years, and in order that the holidays celebrated in the summer shall not fall into winter, as has been and will be the case if the year continues to have 360 and 5 additional days, it is hereby decreed that henceforth every four years there shall be celebrated the holidays of the Gods of Euergetes after the 5 additional days and before the new year, so that everyone might know that the former shortcomings in reckoning the seasons of the year have henceforth been truly corrected by King Euergetes".*

Predictably the Egyptian priests saw this as their power being taken away, they sabotaged the enforcement of Ptolemy III's decree and it did not last beyond his lifetime. Priests saw the ability to predict eclipses held the people in amazement. Anything that reduced their ability to control **TIME** and celestial events threatened their power base. It was around 200 years later when Julius Caesar (100-44BC), having the same problem with the class of priests arising from political corruption, forced him to assume the position of the office of *Pontiff Maximus* to revise the calendar. This is why today the Pope retains that same title today since the fall of Rome.

Therefore, it would not be unusual for the Mayan priests to be one of the few classes within society with such math skills. They would have been the *"keepers of knowledge"* as in other cultures. The *calendar* was actually a multifaceted system of calendars mathematically derived and incredibly complex in comparison to the linear calendar modern man uses today. This may have been beyond the average Mayan to comprehend in original thought reducing him to the same position of being dependent upon the priests.

Where the Egyptians used the star Sirus as their marker, the Maya had a preoccupation with the planet Venus or ***noh ek***. Venus is a heliacal planet, which is a celestial body that first becomes visible above the eastern horizon for a brief moment just before sunrise after a period of time when it had not been visible. The 584-day Venus cycle tracked the heliacal risings of Venus as the morning and evening stars. Many Mayan events were astrologically timed around this cycle. Thus, their calendar was a highly developed interconnection of the cyclical aspects of the Sun, the Moon and what they called the *Great Star - Venus*.

"The School of Athens"
by Sanzio Raphael (1483-1520)

Cyclical calendars that are based upon the moon or other planets can be seen in many ancient civilizations. The ***Metonic Cycle***, which is named after **Meton of Athens** who lived in the 5th century BC, was based upon the 19-year moon cycle. This cycle was used in the Babylonian calendar, ancient Chinese calendar systems (the 'Rule Cycle' 章), the medieval computus (i.e. the calculation of the date of Easter) and still regulates the 19-year cycle of intercalary months in the Hebrew calendar. Hence, Raphael's famous mural of The School of Athens is quite appropriate.

Another example is the clearly the solar cycle of 365.25 days. There is a 28-year cycle where the same day repeats with the same number under the Julian calendar similar to how the Mayan calendar repeats after 52 years. This has created quite interesting mathematic calculations. The Julian calendar Cycle of 7,980-years is actually produced by 19 x 28-x-15. The last 15-year cycle is the Roman tax and census cycle of Indiction. There are calendars based upon Jupiter and its 12-year cycle.

The Maya no doubt viewed the heavens as perhaps the most important aspect within society. This governed planting and foretold the future based upon correlation. They constructed a celestial clock that was a ratio between the Sun, Moon, and Venus that repeated once every 52-years. Their numerical base was 20, known as a vigesimal system, where each unit of a given position represents 20 times the unit of the position which precedes it. A chief exception was made for more closely approximating the solar year the Maya changed the second-order place value which instead represented 18 × 20, or 360 days. This more closely approximated the solar year than would 20 × 20= 400 days. The Maya discovered the concept of zero, which the Egyptians and Archimedes failed to ever accomplish. This erudite discovery of zero existed both in China and among the Maya, further demonstrating this was a unique concept that appeared only within the Eastern philosophy.

Mayian City of Uaxactun (Guatemala)

The interesting aspect of the Mayan calendar is its concurrent and dynamic structure of **TIME**. The use of both the 72 and 26 units of **TIME** has been striking. The Aztec calendar followed the Mayan in many respects and incorporated a 584-day cycle from the planet Venus. Which were two 52-year cycles considered ***"One Old Age"***, when the day cycle, the year, and the period of Venus all merged together. These were also noted by the Mayan, but were more important to the Aztec. All Mesoamericans believed in the cyclical periods of change in the world coming in these great sweeping periods of **TIME**.

The Aztec calendar shares the same basic structure as the Mayan calendar, with two main cycles of 360 days and 260-days. The 260-day calendar was called ***Tonalpohualli*** and was used primarily for divinatory purposes. Like the Mayan calendar, these two cycles formed a 52-year cycle sometimes called the "***century***" model.

The Mayan Calendar is a very interesting and dynamic interlocking structure that reflects the nonlinear thinking process of the Eastern civilizations. It is a fascinating discovery of TIME that has been distorted by the ***Eschatologists*** who we will now look at in more detail.

Chapter XII

Eschatology

The Doomsday Forecast

The Mayan calendar has been usurped by the ***Eschatologists*** and herald as the coming doom & gloom predicting the end of the world. The movie, ***2012 End of the World*** - directed by Roland Emmerich, is the ultimate disaster film. Virtually every culture has its legends and myths of the end of the world. So many predictions have been made before, but they are typically met with amusement given their inevitable failure. The study of end of the world scenarios is known as ***eschatology***, and is derived from the Greek ***Eschatos***, meaning ***'last'*** and the suffix ***'ology'***, meaning ***'study of'***. This is a branch of philosophy and theology which deals with the ultimate destiny of the human race. It typically takes into account an eclectic mix of religious and mystical beliefs that

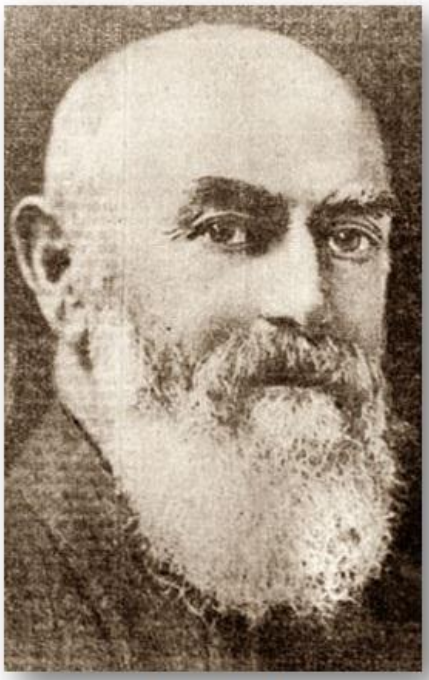
question what will ultimately happen to us all in the end. The most common theme in Western culture has been what can be terms as the ***Abrahamic*** religions (Judaism, Christianity and Islam). Here we find a common belief in the idea of ***Armageddon*** that is the epic battle between good and evil. This is then wrapped within most often a belief in a second coming of a major prophet or Jesus Christ, resulting in a very fiery and final end to the world as we know it.

In Eastern religions, such as Buddhism and Hinduism, there is a fundamental belief in a cyclical view of time and the cosmos. This underscores a basic belief in a never ending cycle of creation and destruction that happens over and over for all eternity. While the recent claims about the mysticism surrounding the ancient Mayan society have been portrayed as predicting the end of the world on December 21, 2012, there is no indication that that the Maya eve made such a prediction. Indeed, it is true that we are reaching the end of one cycle of a 5,126 year Mayan long count calendar cycle. It is thought to be the date on which a significant change in trend will take place on a global scale. However, some interpretations of this have taken it as prophesy of the end of the world.

The center of the doomsday forecasts has been the Mayan ***Long Count*** calendar. The ***Long Count*** was used by the Maya to document past and future events. Their other calendars were simply too short to document any date beyond 52-years. The 52-year calendar, known as the ***"Calendar Round",*** was used as it spans a generation, or the approximate lifetime of an individual. Using the ***Calendar Round*** meant that events in a person's life could be chronicled over 52-years, which was the duration of the ***"Haab"*** or 18,980 unique days. However, if the object was to keep notes regarding historical events beyond 52-years, this is where the ***Long Count*** came into play.

The very term "*the Maya*" as it is being used today in this context is about as nebulous as "*the Americans*" or "*the Europeans*". Officially, "*the Maya*" refers to a wide variety of Maya peoples, both ancient and modern, whose cultural heritage includes one of about thirty different Mayan languages. When we are dealing with the so-called Mayan Calendar, the proper term would be the Mesoamericans who used remarkable ingenuity in its creation. The oldest written language in Mesoamerica was that of the Zapotec. It is clear that their calendar hieroglyphs concerned their secular and religious calendars, both innovations that predate those of other cultures. Each day in the Zapotec religious calendar was designated by one of 20 separate day-name glyphs, combined with a number between one and 13, so that the combination would allow for 260-days of the sacred cycle. Therefore, the basic structure is not really Maya invention inasmuch as what would be fair to say is a Mayan adaptation.

The ancient Mesoamericans tracked time according to ever increasingly larger cycles. How they accomplished this was first established by in the late 19th century, when American journalist Joseph T. Goodman (1838-1917) successfully deciphered the complicated system of the Maya calendar. Goodman founded a newspaper in 1858. He was the owner-editor of this newspaper located in Virginia City, Nevada called the Territorial Enterprise. He gained a good circulation throughout the Western territories, and used this medium also to express his political views such as supporting the Union during the Civil War.



Joseph T. Goodman
(1838-1917)

It was Goodman who noticed comments written in letters that he included in his newspaper on the "Letters" page. He was impressed by a unsuccessful, yet worldly prospector in Aurora, Nevada. He enjoyed the writing talent of this young man and offered him a job. His name was Samuel Clemens, and the stories he wrote were greatly accepted by the readership. His pen name is what he is best known by today - Mark Twain.

Perhaps because Goodman was an editor who paid close attention to type and letters that he deciphered the notation system used in the Mayan calendar. Juan Martinez-Hernandez and Eric J. Thompson later expanded and confirmed this work. Goodman published his findings in 1897 where he described a ***"Long Count"*** system of counting days based on several units or periods of increasingly larger size. This was the ***k'in*** (1 day), ***winal*** (20 days), ***tun*** (360 days), ***k'atun*** (7200 days), and ***bak'tun*** (144,000 days). The ancient Mesoamericans kept track of time using this system, which was combined with additional counts of 260-days (the ***tzolk'in***) and 365 days (the haab) to produce ***Long Count*** dates.

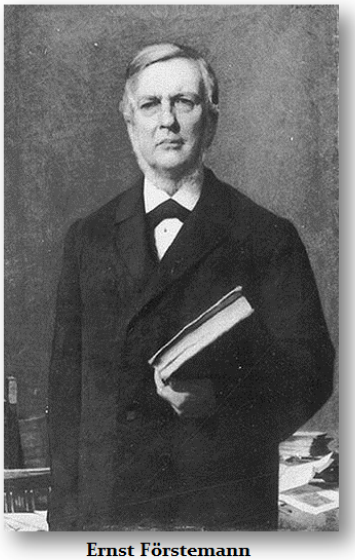
Goodman became fascinated with the cyclical aspect of the calendar. He came to believe there was also a larger ***"Great Cycle"*** of 13 ***bak'tuns*** (1,872,000 days) and determined that the start of the present ***Great Cycle*** was on ***13.0.0.0.0 4 Ajaw 8 Cumk'u*** (*that is 13* ***bak'tunob****, 0* ***k'atunob****, 0* ***tunob****, 0* ***winalob****, and 0* ***k'inob,*** *followed by counts on the* ***tzolk'in*** *and* ***haab***). It was an absolute timescale which was based on a creation date and time was measured forward from this. What date was the Mayan creation date? The date most often taken is 12 August 3114 BC but we should say straightaway that not all historians agree that this was the zero of this so-called ***"Long Count"***. It appears that this was a sacred ***"Creation"*** date for the ancient Maya, who referred to it in their mythology as a kind of "birth" of the present world.

The Last Page of the Dresden Codex

Goodman's idea of a ***13-bak'tun Great Cycle***, is what will end on ***13.0.0.0.0 4 Ajaw 3 K'ank'in,*** which is December 21, 2012 (or possibly December 23).

By no means is this a cycle that predicts the end of the world. At best, the Maya saw this as the end of one age and the beginning of another. Goodman's interpretation was that the present ***13-bak'tun Great Cycle*** was the 54th in an even larger ***Grand Era***, comprised of ***73 Great Cycles***. In other words, Goodman saw this as a fractal structure with one cycle as a component of an even larger one in the same time sequence. Therefore, the Maya calendar does not actually end with a 13- or 20-***bak'tun*** count. The Maya projected dates far into the future as one inscription predicts that the anniversary of the coronation of *K'inich Janaab' Pakal*, who was the 7th century Maya king of Palenque, would still be celebrated in 4772AD. David Stuart, the Mayanist scholar and professor of Mesoamerican art and writing at the University of Texas at Austin, has pointed out that there are Maya dates that project farther into the future than modern astronomers project backward to the origin of the universe some 13.7 billion years ago.

A German scholar, Ernst Förstemann (1822–1906) interpreted the symbols and images on the last page of an pre-Hispanic Maya book called the ***Dresden Codex*** after Goodman's work was first published. It was his doomsday references to the end of the world in some great cataclysmic flood that captured the attention of many. Förstemann's ideas of some "destruction of the world," would take place as an "apocalypse" was an attempt to use pagan beliefs to verify Biblical prophesies of the end of the world. This religious bent was repeated by American archaeologist Sylvanus Morley (1883–1948) who was a Harvard-trained archaeologist. Morley was not only one of the most respected scholars of the early twentieth century *(the museum at the Maya site of Tikal is named after him)*, but he was also *"the best secret agent the United States produced*



Ernst Förstemann
(1822–1906)

Michael D. Coe
(born 1929)

during World War I," according to a new book by historians Charles Harris and Louis Sadler. Drawing on a wealth of archival materials, the authors have chronicled Morley's exploits in *The Archaeologist Was a Spy: Sylvanus G. Morley and the Office of Naval Intelligence (Albuquerque: University of New Mexico Press, 2003; $32.50)*. This certainly adds more flavor to these doomsday predictions. The book claims that some twentieth-century archaeologists worked covertly with intelligence agencies in a sort of Raiders of the Lost Ark. In any event, Morley wrote, in his 1915 book on ancient Maya hieroglyphic writing. Morley then added his own trimmings, writing:

"Finally, on the last page of the manuscript, is depicted the Destruction of the World..."

Morley portrayed with a dramatic touch that the final all-engulfing cataclysm would take place with another Noah-like in the form of a Great Flood. Morley repeated these comments later in his popular book ***The Ancient Maya*** published in 1946. The image represents the annual arrival of the rainy season, not some Noah-like cataclysmic flood ushering in the end of the world.

There is no doubt that the ideas of Goodman, Förstemann, and Morley have combined to influence American archaeologist Michael D. Coe (born 1929), of Yale University, but Harvard educated, who has also interpreted elements of Aztec mythology, particularly the ***"Legend of the Five Suns"*** as evidence for ancient beliefs in cyclical periods of destruction. The term ***Five Suns*** is in the context of what are known as creation myths among the Aztec and other Nahua peoples. There is extensive support regarding this aspect distributed among the ancient texts and calendars. The belief is that the present world was preceded by four other cycles of creation and destruction. It is principally derived from the mythological, cosmological and eschatological beliefs and traditions of earlier cultures of the Mesoamerican region in general.

Sylvanus Morley
(1883–1948)

In the creation myths which were preserved by the Aztec, the central tenet was that there had been four worlds, or "*Suns*", before the present. These earlier worlds and their inhabitants had been created, and then destroyed by the various catastrophic important actions. This does support the myths of Atlantis and may indeed be the Great Flood of Noah. The present world is the fifth sun, and the Aztec saw themselves as *"the People of the Sun,"* whose divine duty was to wage cosmic war. This warlike culture of the Astec was in their religion required in order to provide the sun with his ***tlaxcaltiliztli*** *("nourishment").* Without it, the sun would disappear from the heavens above. Thus the very survival of the universe depended upon the offerings of blood and hearts to the sun. This ***"Legend of the Five Suns"*** was first recorded in the 1550s.

Coe summarized his ideas in a popular textbook, ***The Maya*** (1966). In each edition Coe associated the completion of the ***13th bak'tun*** with "Armageddon," a reference from Christian beliefs expressed in the Book of Revelation that there will be a final destruction associated with the Second Coming of Jesus Christ. Coe noted that based on Aztec beliefs, the present world would be destroyed by earthquakes, but he personally did not subscribe to this end of the world cataclysm.

Nevertheless, it was Goodman who deciphered the Mayan calendar and revealed its cyclical nature. The "***Long Count***", which was a significant departure from the shorter calendars, is numerically predictable, not based on archaic measures of time. The ***Long Count's*** numerical value has been assailed by many Mayan scholars who claim that while the calendar will ***"run out"*** after 5,126 years, they insist that is just arbitrary and insignificant. They are so defensive concerning the doomsday forecasts that they have abandoned all rational investigation of the subject matter. This is a cycle of 5,126 years or 1,872,271.5 days using 365.25 days for the calculation. If we divide that number of days by 260, we arrive at 7201 intervals. There is nothing to suggest that the Maya or any other civilization ever stated that this cycle simply ended in 2012. It is a cycle and the earth is obviously much older than 5,126 years.

Aztec Calendar

Nevertheless, some have argued that a natural disaster takes place establishing the beginning and end of each cycle, such as Noah's flood, and this time they argue it will be by fire. This part of the predictions for the latest end of the world scenario appears to emanate from the Aztec, not the Maya. The Aztec ***"Legend of the Five Suns"*** appears to be the origin of the doom and gloom that is the latest scenario to be hawked by the ***Eschatologists***.

This idea has long captured the imagination of many. From a cyclical perspective, it makes sense that there would be a cycle of major climatic events with a cyclical duration of anything between 6,000 to 7,000 years with a 1,000 year decline. Others have argued that this is what the Bible really means when it states that *"God created the world in 6 days and the 7th he rested"* pointing to a passage that a day to the Lord is like a thousand years. No doubt, this is some of the particulars on the surface of this mystery that has been created surrounding this question about 2012 and whether or not it predicts some natural disaster or the end of the world.

Nevertheless, some have claimed that indeed 5,200 years ago, the world of the Maya ended, and so did their calendar. For the Maya, time was a series of cycles that would repeat. Their calendar always ended in a terrible event. A new calendar began which will end in December, 2012. The Maya never said that life on Earth would end, however in one of their Codex that was not destroyed by the Spaniards, in the Códice de Dresden –it contains an illustration with the picture of the Underworld or Xibalbá: on top, it has a representation of the flood. There are also warnings of disasters, end of a cycle and planets aligned.

"Evidence shows that around 5,200 years ago, solar output first dropped precipitously and then surged over a short period. It is this huge solar energy oscillation that Thompson believes may have triggered the climate change he sees in all those records. But more importantly, they believe it has happened at least once before, and the results were nearly catastrophic to emerging cultures at the time. He outlined his interpretations and fears at the annual meeting of the American Geophysical Union in San Francisco. A professor of geological sciences at Ohio State and a researcher with the Byrd Polar Research Center, Thompson points to markers in numerous records suggesting that the climate was altered suddenly some 5,200 years ago with severe impacts." **Lonnie Thompson** (born 1948).

Unfortunately, you will still have to pay your taxes in 2013. There will be no end of **TIME**. There may not be the end of the world on December 21st, 2012, but we are headed into the peak of energy output for the sun. ***Sallie Louise Baliunas*** (born 1953) is an astrophysicist at the Harvard-Smithsonian Center for Astrophysics and formerly the Deputy Director of the Mount Wilson Observatory.


Sallie Louise Baliunas
(born 1953)

Global warming is another topic that people attribute purely of course to the power of mankind. We engage in observing a tiny fraction of what is taking place, often only zooming in on a predetermined outcome. Research, if you can call it that, has now become a metaphor disguising a real form into propaganda. Like an elevator moving upward in a high rise, if you only focus on floors 10 through 20 in a 200 story building, you will just observe the elevator passing by as it is moving higher. By narrowing your focus, you are then led to conclude that the elevator is only rising higher with no end in sight. By ignoring what took place previously, or what will take place afterwards, you are convinced that the elevator only rises. This frame of mind overlooks that the elevator rises and falls and the conclusion emerges, like global warming, that it is forever only rising and it is far too narrow of a focus for reliable data or conclusions.

Weather simply refers to the condition of the air on earth at a given place and time - regardless if it is warm or cold, dry or wet, blowing or calm. The condition of air and its reaction to create weather is influenced primarily by two things - heat (the sun) and water. Weather on earth begins with the sun. The sun's heat warms our atmosphere and causes two things to happen,

1) water evaporates into the air
2) air rises

As air rises, its temperature drops. As the moisture in the air cools, it condenses into tiny suspended droplets, forming clouds. The droplets inside the clouds become larger a more moisture is evaporated into the air. Eventually, they are too heavy to remain suspended and fall to earth as precipitation - rain, snow, sleet or hail. Clearly, the most significant factor driving the weather is the energy output of the sun. We will explore this aspect from a cyclical perspective tied to the economy of mankind. The work of **Sallie Baliunas** is highly important in understanding the long-term interaction between weather and the economy. As I have stated previously, she gave a presentation at the Foundation for the Study of Cycles which was quite enlightening. Her conclusion to her June 5th, 2001 review at the George C. Marshall Institute, Washington, D.C. stated bluntly:

Summary and Conclusions

Sallie Baliunas is senior staff astrophysicist at the Harvard-Smithsonian Center for Astrophysics, Deputy Director of Mount Wilson Observatory and Senior Scientist at the George C. Marshall Institute in Washington, DC. Her awards include the Newton-Lacy-Pierce Prize of the American Astronomical Society, the Petr Beckmann Award for Scientific Freedom and the Bok Prize from Harvard University. In 1991, Discover magazine profiled her as one of America's outstanding women scientists.

"The climate record shows that the global warming of 1°F observed over the last 100 years is not unusual. Global temperature changes of this magnitude have occurred frequently in the past and are a result of natural factors in climate change.

But is it possible that the particular temperature increase observed in the last 100 years is the result of carbon dioxide produced by human activities? The scientific evidence clearly indicates that this is not the case.

All climate studies agree that if the one-degree global warming was produced by an increase in carbon dioxide in the atmosphere, the additional CO2 first warms the atmosphere, and the warmed atmosphere, in turn, warms the earth's surface. However, measurements of atmospheric temperatures made by instruments lofted in satellites and balloons show that no warming has occurred in the atmosphere in the last 50 years. This is just the period in which human made carbon dioxide has been pouring into the atmosphere and according to the climate studies, the resultant atmospheric warming should be clearly evident.

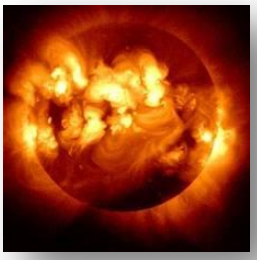
The absence of atmospheric warming proves that the warming of the earth's surface observed in the last 100 years cannot be due to an increase in carbon dioxide in the atmosphere caused by human activities. The recent global warming must be the result of natural factors in climate change."

We may indeed see climate changes that are in fact part of the natural course of cyclical character of the world we live in. However, there will be no end of the world as we know it. This cycle has come and gone many times. By no means has it indicated the end of the world. Climate changes are indeed a natural part of the consequence.

Chapter XIII

Magnetic Polarity Reversals

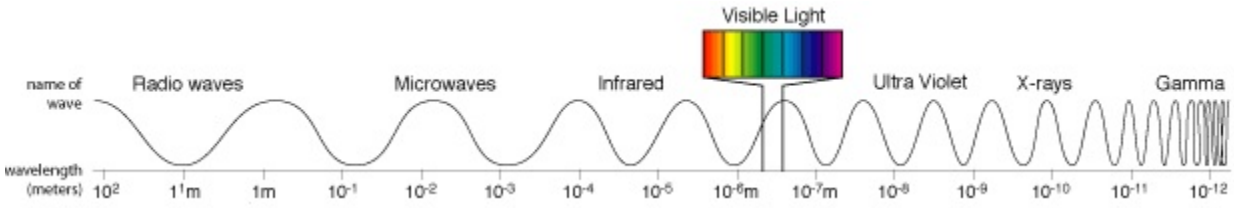
There has been so much hype about the shifting of the poles that many have assumed it is pure fiction. Actually, the magnetic north pole is moving toward Russia at a pace of about 40 miles per year. This has caused tremendous problems. The Tampa International Airport closed its primary runway briefly in January 2011 in order to repaint the numeric designators at each end. Additionally, they had to change taxiway signage to account for the shift in location of the Earth's magnetic north pole as reported by ***The Tampa Tribune*** on January 5, 2011 and the NBC Nightly News January 2011. The ***Federal Aviation Administration*** actually required the runway designation be changed to account for what the ***National Geographic News*** reported was a dramatic yet gradual shift of the Earth's magnetic pole toward Russia. A movement of 40 miles per year may be technically gradual. However, in less than 2.5 years, that is the distance between Philadelphia and New York City.



Of course the idea that the poles actually shift and may indeed flip positions sounds very Sci-Fi. The last one took place about 780,000 years ago and the cycle worked out from the data by our computer is approximately 720,000. So are we due to a polar magnetic shift? The answer is YES! Is this a doom & gloom forecast? That is what we are about to explore. Keep in mind, however, that a flipping of the pole is precisely what takes place on the Sun in a much shorter cycle known as Sunspots that occur once every 11 years.

Sir Frederick William Herschel
(1738–1822)

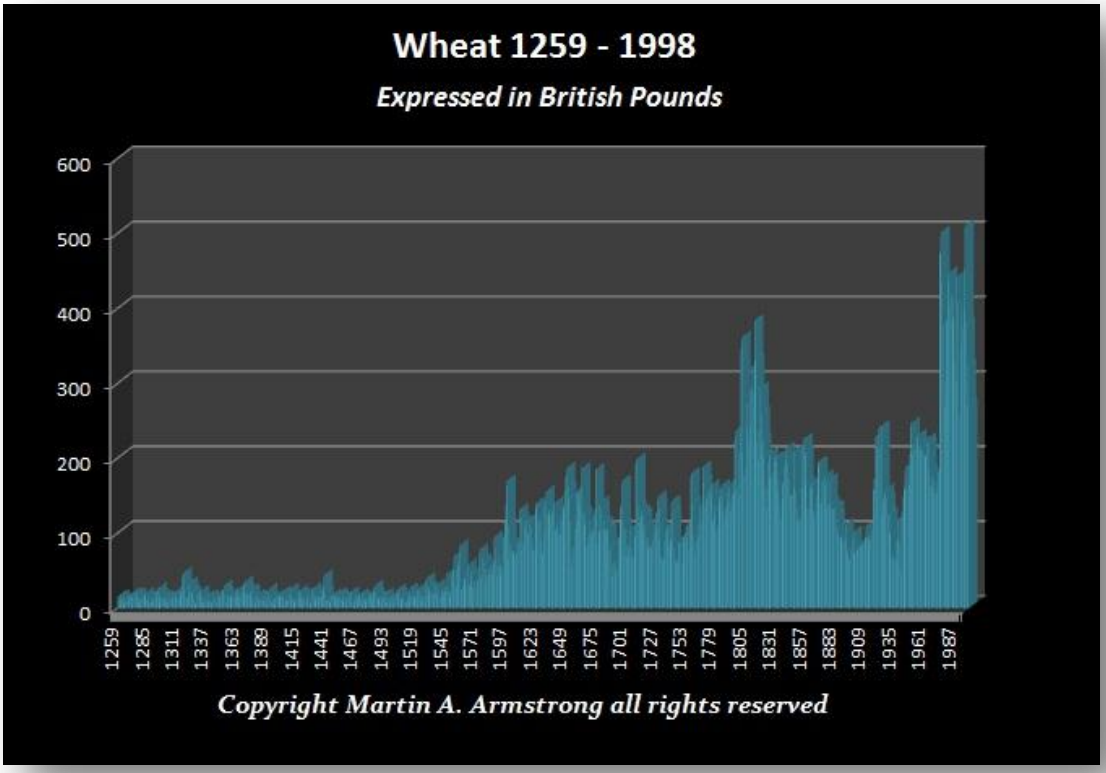
On February 11th, 1800, Sir Frederick Herschel (1738-1822) was testing filters for the Sun so he could observe the source of energy in the solar system. It had been Nicolaus Copernicus (1473–1543) who established that the Sun was the center of the planets not the earth. However, observing the Sun was next to impossible without burning your eyes. When using a red filter Herschel found there was a lot more than just the heat produced.



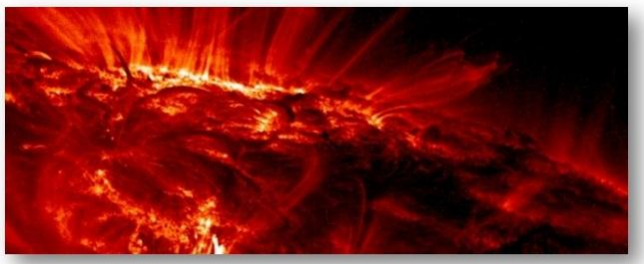
Herschel discovered infrared radiation in sunlight. He passed the light through a prism holding a thermometer just beyond the red end of the visible light spectrum. He was using the thermometer as a control to measure the ambient air temperature in the room. He was surprised when the thermometer showed that there was a higher temperature than the visible spectrum. Herschel now concluded that there must be an invisible form of light beyond the visible spectrum.

It was very interesting that Frederick Herschel began to look at the world in a dynamic manner. He pondered the consequences of his discovery that there existed cycles within the energy output of the Sun. What if the Sun beats like your heart and is not a steady outflow of energy?

That would certainly have profound consequences he assumed. Frederick Herschel, realizing that if the energy output of the Sun fluctuated, pondered the ides that such a situation might perhaps have a major influence upon the prices of food. It could even explain droughts that caused the rise and fall of the prices of commodities overall. This was certainly a logical question to explore and thus Herschel embarked upon the first real dynamic investigation.

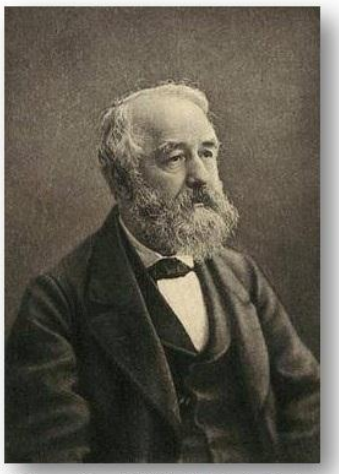


In 1801, Herschel then took his discovery to the next level. He noted an apparent connection between wheat prices and sunspot records. Thanks to British taxation, records of wheat prices that existed going back to 1259, Herschel was now ready to test his theory. Did sunspots affect agriculture? This was the first real dynamic investigation attempting to correlate the economic activity of man with that of nature. Did these observations of nature have a profound impact upon the world around us? Could this be proven by looking at price data that spans the course of centuries?



Sun Spots - A Dynamic Cyclical Event that Sparked Imagination, Curiousity, and Scientific Investigation

What Herschel was embarking on was in part similar to what the Maya had accomplished; the exploration of a hidden



Johann Rudolf Wolf (1816-1893)

Samuel Heinrich Schwabe (1789–1875)

cyclical order within nature and its influence upon mankind. Within these experiments was a secret to everything; the existence of the cyclical nature of life and the universe. Herschel was venturing into the realm of how the universe was constructed. From the ancient past man has invented gods to explain the cyclical nature of events that some storm was the result of a temper tantrum. The image a god was not of a single divine caring person, but often a race of super beings that tormented mankind. The future could be changed as the Roman goddess Fortuna was pictured – one hand on the cornucopia capable of making life a please, and the other on the rudder of a ship able to change the course of your fortune in the passing whim of goddess.

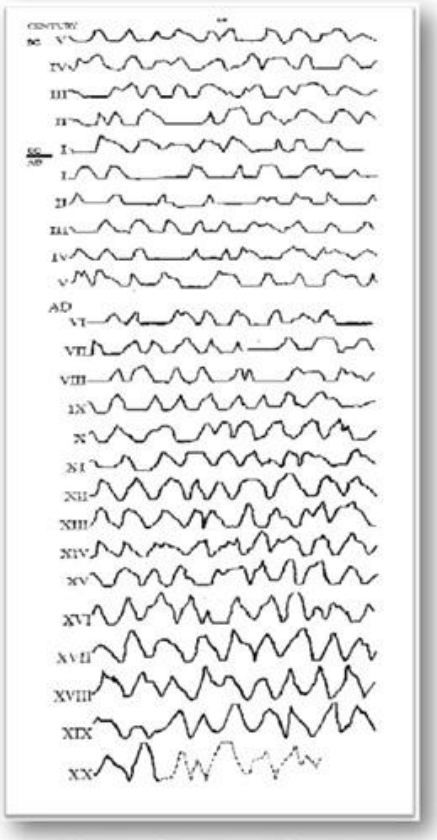
The observations of the Sun opened a whole new way of looking at nature and its interconnectivity to the economic history or mankind. Samuel Heinrich Schwabe (1789–1875) discovered that sunspots had a cycle. From 1826 to 1843, Schwabe observed the Sun on every clear day for 17 years recording the sunspots trying to detect the mythical planet Vulcan among them. Vulcan was a small planet proposed to exist in an orbit between Mercury and the Sun that was proposed to explain peculiarities of Mercury's orbit by the French mathematician Urbain Jean Joseph Le Verrier (1811–1877) who hypothesized that they were the result of another planet, which he named Vulcan. No such planet was ever found. Nevertheless, Schwabe, while searching for the mythical planet that was never discovered, he noticed that there was a regular cycle or variation to the number of sunspots appearing. He published his findings in a short article entitled "***Solar Observations during 1843***." Later, Johann Rudolf Wolf (1816-1893) was a Swiss astronomer who discovered the sunspot cycle previously discovered by had a period of 11.1 years and was linked to geomagnetic activity on Earth. During his

research, he developed a method of measuring the activity of sunspots known as the Wolf sunspot number that is in use today.

A. L. Tchijevsky (1897-1964)

Because of these recorded observations, we now know that during the 17th century there had been a low number of sunspots during what is now recognized as a period of low solar activity, known as the ***Maunder Minimum***. By the 19th century, it became clear that there were cycles of minimum and maximum to the sunspots. So there was a fractal structure showing there was a great cycle of the 11 year sunspot cycles that build in intensity into giant waves of solar activity.

By 1900, the investigations into sunspots began to explore connections between solar variations weather and impact upon human activity by a Russian Scientist Professor A.L. Tchijevsky (1897-1964) who during World War I noticed between 1916 and 1917 during the period of peak sunspot activity and the solar explosions that followed correlated with the war.



Human Excitability Cycle
A.L. Tchijevsky (1897-1964) 500BC 1922AD
Displayed by Century

He correlated this to history to study the connection if any. The historical data base of 500BC – 1922AD covering 72 countries was compiled. After evaluating the most important events, Tchijevsky noticed that the most important human events had occurred during 80% of the maximum sunspot activity. His work became the Reservation to the attention of the solar physics of the behavior of the human connection, "*Mass Human Uyarılabilirliğinin Index*" or what became known as the ***Human Excitability Cycle***.

George Ellery Hale (1868–1938), an American astronomer, who in 1908 showed that sunspots were strongly magnetized making the first detection of magnetic fields outside the Earth, and in 1919 went on to show that the magnetic polarity of sunspot pairs flipped. The poles of the Sun actually reversed polarity every 11 years. Other studies of the Sun have detected 27 harmonic periods within the 273-month cycle, known as the ***Hale Cycle***, which included 7, 13, and 39 month patterns. The world in which we lived was beginning to

William Stanley Jevons (1835-1882)

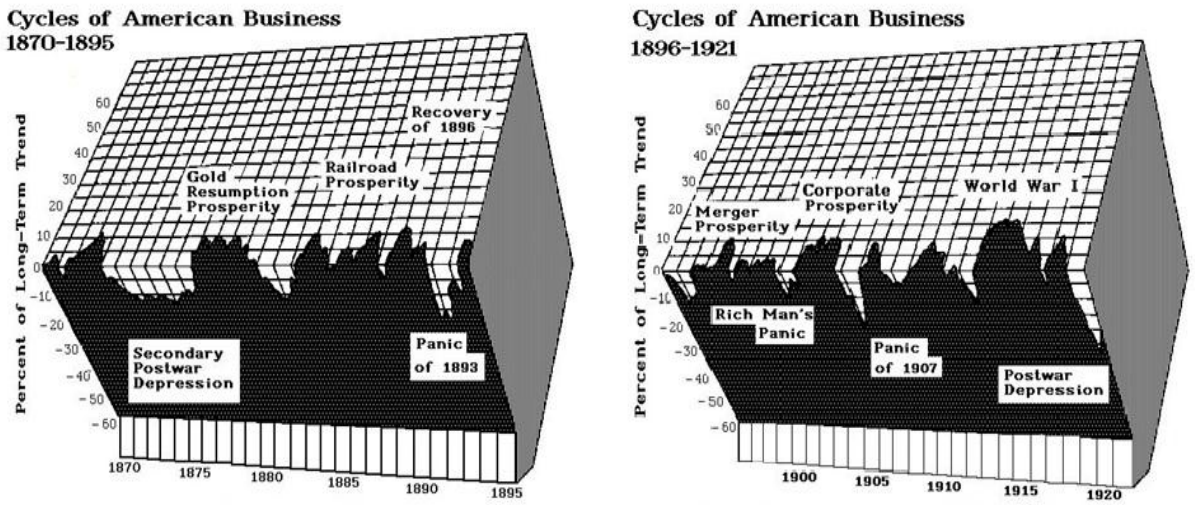
show a cyclical activity to absolutely everything. Tchijevsky had observed influences that seemed to affect the behavior of mankind and these magnetic properties that can disrupt TV and satellites, were starting to reveal perhaps a more complex system in which we exist.

Others have sought to link the nature of sunspots to human behavior. If the sunspot cycle of 11 years is in reality the shifting of the poles on the Sun, then perhaps this is a topic worth exploring. Indeed, the understanding that cyclical activity had been the cornerstone of nature was beginning to migrate to other fields. William Stanley Jevons (1835-1882) was an accidental economist. He was studying natural science at the University College in London. He left school in 1854 and took an exciting job as an assayer in Sydney, Australia, as the big gold rush developed in 1851. Jevons thus was exposed to the real world and this experience in the bullion field with wildly fluctuating prices, exposed him to trends that were not yet even talked about in moral philosophy since there was no course on Economics until Marshall in 1903 at Cambridge.

The gold discoveries in Australia in 1851 down in Victoria set off a gold rush coming following the California discoveries in 1849. This dramatically now increased the quantity of money creating an inflationary boom since gold was fixed, then prices rose in response to the increase in supply. This led to the Panic of 1857 that produced a global Contagion that caused Jevons to return to England in 1859. Jevons began to see the world economy in terms of a cycle with its rallies and the inevitable fall. He wrote his observations in 1862, the General Mathematical ***Theory of Political Economy***, which he followed up the next year with ***A Serious Fall in the Value of Gold (1863)***. It was Jevons who created indexes and mapped out inflation. This was the first quantitative analysis of money and prices.

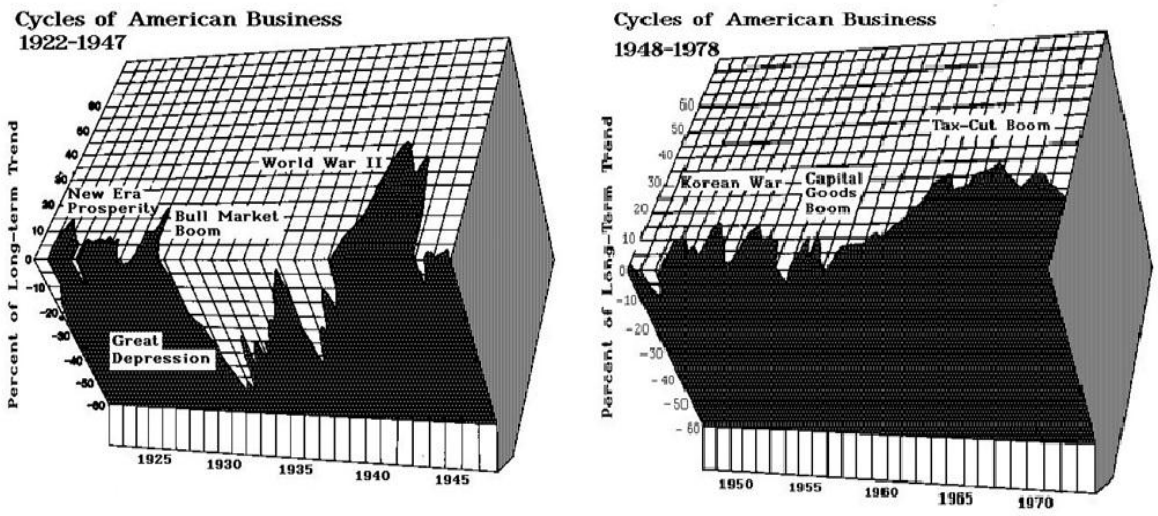
Because Jevons was in the real world, he saw firsthand what was taking place. He caught a glimpse of cyclical behavior and that was much more akin to the **Catastrophic** school of thought rather than the **Uniformitarian** views. A few years later, he wrote **The Coal Question** in 1865 in which he provided a forecast that the supplies of coal in England would decline and that prices would undergo a dramatic price rise.

Jevons became fascinated by the rise and fall of economies and markets. He witnessed firsthand the first real Global Contagion in 1857. He thus saw a world that was interconnected even back then. It was also a period of turmoil in science.



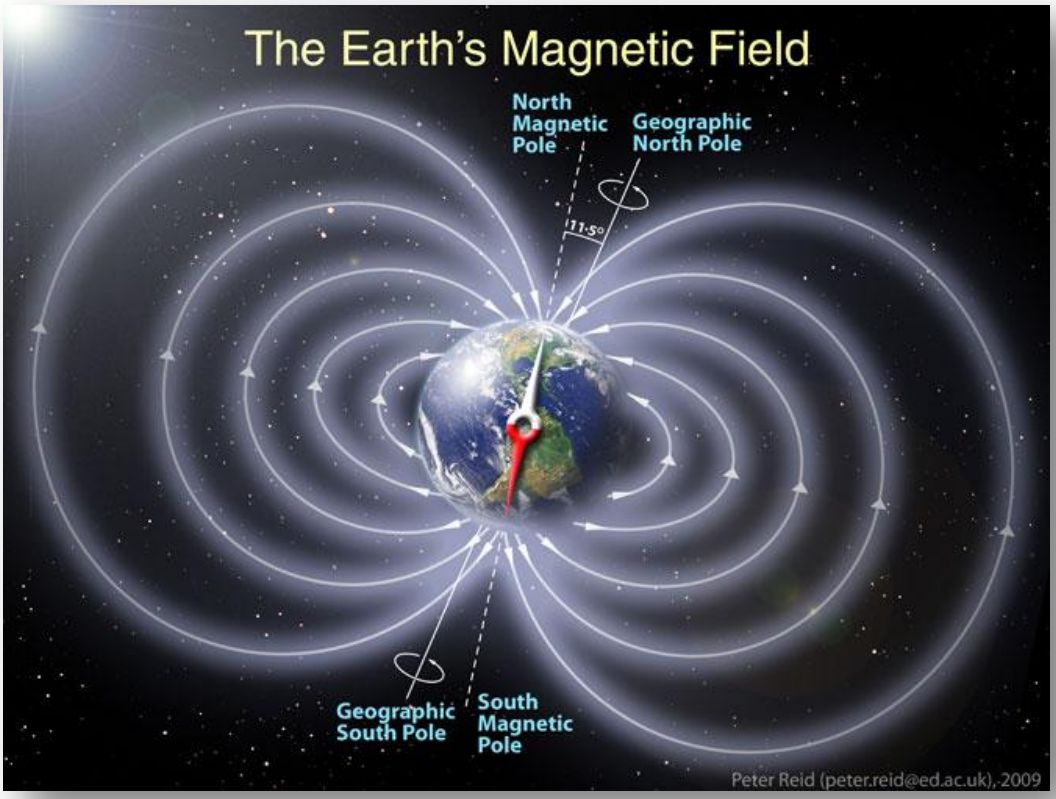
Jevons' ***A Serious Fall in the Value of Gold*** (1863) and ***The Coal Question*** (1865) placed him in the front rank as a economic writer and statistics. His further writings ***Money and the Mechanism of Exchange*** (1875), was written for the general public describing the economy rather than merely offering theory. This was followed by a ***Primer on Political Economy*** (1878), ***The State in Relation to Labour*** (1882), and two later works that were published after his death, ***Methods of Social Reform*** and ***Investigations in Currency and Finance***. It was this last volume where Jevons reveals his quest to understand the driving force behind the cyclical patterns within the economy. Jevons speculates on the connection between the economic and commercial crises and sunspots. Herschel's investigation of sunspots and wheat prices was certainly logical since crops are directly impacted by weather. During this period of the 19th century, agricultural accounted for 70% employment of the civil work force around 1860 falling with the rise of the Industrial Revolution to about 40% by 1900. Without question, Jevons logically considered the possible influence of sunspots upon the economy. He was indeed preparing of a large treatise on economics and had drawn up a table of contents and completed some chapters and parts of chapters. This fragment was published in 1905 under the title of ***The Principles of Economics***.

In ***The Coal Question***, Jevons covered an interesting aspect of market prices and its relation to supply and demand. For example, he explained that improving energy efficiency would typically reduce energy costs, however, paradoxically, this leads only to increase rather than decrease energy use and this in turn creates a counter-balance within the entire system. ***The Coal Question*** is a brilliant observation of how markets truly function. Jevons's son, H. Stanley Jevons, published an 800-page follow-up study in 1915 in which the difficulties of estimating recoverable reserves of a theoretically finite resource are discussed in good detail.



Jevons in an overlooked minor work, "***Commercial Crises and Sun-Spots***" he analyzes the business cycles, proposing that crises in the economy might not be random events, but might be based on discernible prior causes. To clarify the concept, he presented a statistical study relating business cycles with sunspots. His reasoning was that sunspots affected the weather, which, in turn, affected crops. Crops changes could then be expected to cause economic changes. Obviously, the theory that light itself moving in cyclical waves first established by Christiaan Huygens (1629-1695), which was over-shadowed by Sir Issac Newton (1642-1695), was making a come-back thanks to Thomas Young (1773-1829) who rescued Huygens' work. By 1850, it was then Huygens who was now accepted as being correct, not Newton. This created a vibrant world of inquiry regarding the Sun and it is to Jevons that the theory of a possible link between the behaviors of man may be influenced by sunspots rather than just Herschel's exploration of the impact of sunspots upon wheat prices.

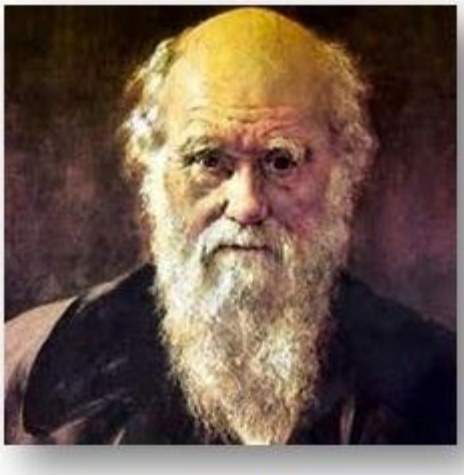
Jevons was the first to consider that there was a cyclical aspect to the economy. His work foreshadowed several developments of the 20th century looking at things from a cyclical perspective. Jevons effectively created the '***marginal revolution***' in economic theory shifting the focus from classical to neoclassical economics. He was the certainly the first economist to construct index numbers that greatly influenced the development of empirical mathematical methods and the use of statistics giving rise to econometrics in the social sciences. However, the field ignored his cyclical perspective and thus economics, which began as a separate course taught at Cambridge University in 1902, went off in the wrong direction. While Jevons' philosophy was a precursor to the development of logical empiricism, but because of his cyclical vision of the economy, he remains largely overlooked as many took what they liked and ignored the essence of his insight. However, the mathematical and deductive economic aspects employed by Jevons were incorporated by many.



It is difficult to explain why the magnetic field positions of magnetic north and magnetic south are interchanged flipping on the Sun every 11 years yet geomagnetic reversal on the Earth appears to take place every 720,000 years. The Earth's field has alternated between periods where what we call currently the North Pole is above Canada (normal polarity for human society), and reverse polarity, in which the field was the opposite. These periods are called ***chrons***. The time spans of chrons are randomly distributed with most being between 0.1 and 1 million years with an average of 450,000 years. Most reversals are estimated to take between 1,000 and 10,000 years. The latest one, the ***Brunhes–Matuyama Reversal***, occurred about 780,000 years ago. It is named after Bernard Brunhes and Motonori Matuyama, and was an important geologic event when the Earth's magnetic field last underwent reversal. Just how the reversal took place is the subject of debate whether it occurred slowly over several thousand years, or more abruptly. The North Pole is currently moving very rapidly at about 40 miles annually toward Russia. Is this a gradual shift, or is it the beginning of a dramatic pole shift that will be abrupt? Nevertheless, this event has been useful in dating ocean sediment cores. After inputting all the data on pole shifts collected from ocean sediment cores, the computer model that I used came up with a frequency of 720,000 years between reversals.

The discovery of pole shifts is a fairly recent event as early 20th century geologists first noticed that some volcanic rocks were magnetized opposite to the direction of the local Earth's field. The first estimate of the timing of magnetic reversals was made in the 1920s by Motonori Matuyama, who observed that rocks with reversed fields were all of early ***Pleistocene Age***, which was a he geological epoch that lasted from about 2,588,000 to 11,700 years ago.

The central question that dominates virtually every field of science has been to identify **HOW** something moves? Do things move in a nice progressive gradual linear fashion, or are they a burst of chaotic energy from the unknown abyss? This debate between a sudden ***catastrophic*** event that appears almost out of nowhere without warning and the slow gradual progression portraying the linear world of ***uniformity***, has been raging since the mid to late 1700s.

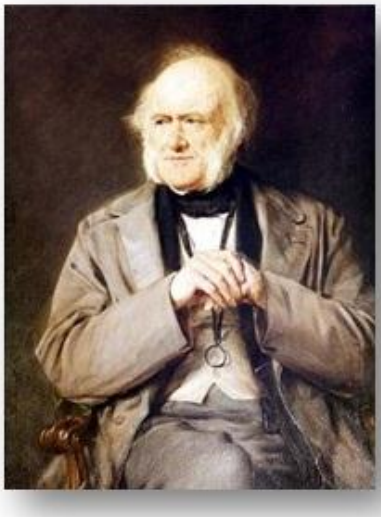


Charles Darwin (1809-1882)

To a great extent, this clash between ***catastrophe*** and ***uniformity*** is also an emotional issue. The idea that systems just collapse in a catastrophic manner can be disquieting to say the least. For this reason, ***uniformitarianism*** soothes the senses and brings order to the future dominated by uncertainty. Yet, these two clashing schools of thought that lie at the core of just about everything from the Big Bang to **Charles Darwin's (1809-1882)** Theory of Evolution, which began with the discovery first in 1772 near Vilui, Siberia of a intact frozen woolly rhinoceros followed by the more famous discovery of a frozen mammoth in 1787. You may be shocked, but these discoveries of frozen animals with grass still in their stomach, set in motion these two schools of thought since the evidence implied you could be eating lunch and suddenly find yourself frozen to be discovered by posterity.

The field of geology also began to create great debates that perhaps the earth simply burst into a catastrophic convulsion. This view of sequential destructive upheavals at irregular intervals emerged during the 1700s. This school of thought was perhaps best expressed by a forgotten

contributor to the knowledge of mankind, **George Hoggart Toulmin** in his rare 1785 book, "***The Eternity of the World***"



Charles Lyell (1797-1875)

> " ••• convulsions and revolutions violent beyond our experience or conception, yet unequal to the destruction of the globe, or the whole of the human species, have both existed and will again exist ••• [terminating] ••• an astonishing succession of ages."
>
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James Hutton

The uniformitarian view was also published in 1785 by **James Hutton** in his "***Theory of the Earth***" where he took the view that "***little causes, long continued, which are considered as bringing about the greatest changes of the earth.***" I believe that it was Hutton's work that also gave birth to the notion of the theory of ***complex adaptive systems***, albeit, he never articulated that precise concept nor used that label. Hutton suggested that thousands of separate trends operating over a very "***long succession of ages***" rebut the argument of the ***catastrophe*** advocates whose general hypothesis assumes "***violent causes.***"

Consequently, the discovery of the frozen mammoth in 1787 following the woolly rhinoceros in 1772 sparked the imagination that truly contributed to the "***Age of Enlightenment***" where there was a burst of knowledge erupting in every field of inquisition. Such finds of frozen mammoths in Siberia continue to this day. This has challenged theories on both sides of this debate to explain how there can be such catastrophic events. These frozen animals in Siberia suggest strange events are possible even in climates that are not that dissimilar from the plaster casts of dead victims discovered buried alive in the volcanic eruption of 79AD at Pompeii in ancient Roman Italy.

These discoveries in Siberia led to an explosion in the pursuit of knowledge. This great debate between catastrophic sudden change and the slow progressive theory of ***uniformity*** even inspired **Charles Darwin** (1809-1882) giving rise to his theory of evolution that was part of the

Ignaz Venetz

uniformitarian view of the world. It was in 1830 when **Charles Lyell** (1797-1875) wrote "***The Principles of Geology***" published in three volumes between 1831 and 1833. Lyell adopted Hutton's view that there was no past geological process that was different from the present. Lyell became the accepted view because that is what people wanted to hear before bedtime with their warm milk and cookies. Sleep tight, because everything is a gradual process and those nasty catastrophists should be thrown in a closet and locked away for eternity. They were in many ways diminished to the lunatic fringe.

It was Lyell who introduced this term in 1839 to describe strata in Sicily that had at least 70% of their molluscan fauna still living today. This distinguished it from the older ***Pliocene Epoch***, which Lyell had originally thought to be the youngest fossil rock strata. At the time, the Earth's polarity was poorly understood if at all even considered.

The concept of catastrophic violent actions has been buried as much as possibility because people do not want to listen to the fact that tomorrow could be dramatically different from today. Every study shows that the most feared thing is ***sudden change***. This dominates the question of Polar Shifts. Some just do not want to consider that the poles can flip abruptly or what would be the consequence of such an event. Ignoring that possibility does not make it go away. It is possible that the poles begin to slip as we see right now moving 40 miles toward Russia annually. This might then be suddenly end with a sudden flip that is abrupt and may explain the suddenly frozen animals in Siberia.

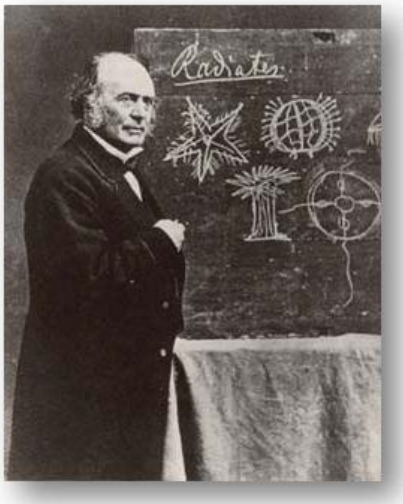
This clash between ***catastrophe*** and ***uniformity*** may be traced in modern times to **Toulmin** and **Hutton** in 1785. However, it was **Charles Lyell** who became the true demigod of ***uniformitarianism***. Lyell became the man who locked the catastrophists in the closet and because of his views that supported what the people wanted to hear, he was knighted for his work. Thus, it is **Lyell** who effectively created the concept of the lunatic fringe that has also embraced conspiracy theories that in any way suggest there is an abnormal trend or some abrupt violent convulsion that politically can even emerge as a revolution.

It might be shocking, but this entire period of the late 1700s sparked a truly profound ***Intellectual Revolution*** that erupted in every field. In 1821, 9 years before **Lyell's** work, there was a Swiss engineer **Ignaz Venetz** (1788-1859) who took a bold position also inspired by the Siberian discoveries, that there had been a former Alpine glaciation on a massive scale. His 38 page report was published posthumously in 1859. It was the birth of the idea of an **Ice Age**

theory. A Norwegian geologist **Jens Esmark** *(Esmarch)* (1763-1839) also argued that the Norwegian glaciers had been much greater in size.

What was emerging was a view that history was in fact non-linear. Weather was not a static progression of ***uniformity***. Just as there was a cycle to the seasons, the idea that cycles existed on a much larger scale began to emerge. The very idea of an ***Ice Age*** implied a change in weather patterns. History was perhaps not linear even within the context of nature.

In 1832, **Professor Albrecht Reinhard Bernhardi** (1797–1849) argued that the North Polar ice cap had extended into the plains of Germany. To support this theory, he pointed to the existence of huge boulders that have become known as "***erratics***" he suggested were pushed by the advancing ice. This was a shocking theory for it was certainly a nonlinear view of natural history. **Bernhardi** was thinking out of the box. However, in natural science people listen and review theory unlike in social science where theory is ignored if it challenges what people want to believe. In 1834, **Johann von Charpentier** (1786-1855) argued that there were deep grooves cut into the Alpine rock concluding, as did **Karl Schimper,** that they were caused by an advancing **Ice Age**.



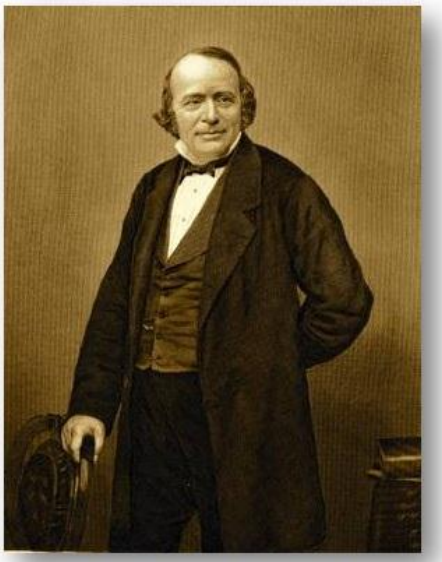
Professor A. Bernhardi

You can see perhaps how those discoveries in Siberia truly sparked an ***Intellectual Revolution***. Suddenly, the world was not the boring place where all things remained perpetually the same. Nevertheless, with the emerging theory of an **Ice Age**, there was still this clash between the ***catastrophe*** and ***uniformity*** view of the world. Yet to allow everyone to sleep at night, the **Ice Age** theory was placed into the camp of the ***uniformitarians*** because it was a **SLOW** moving theory rather than a sudden violent change, even though that did not explain the Siberian discoveries that had sparked everything to begin with.


Bernhardi's "*erratics*"

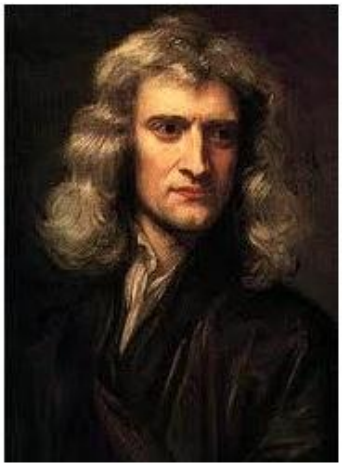
Nonetheless, building upon these shoulders, it was in 1836 that **Louis Agassiz** (1807-1873), a Swiss naturalist, who more forcefully put forth that the evidence of deeply cut grooves cut into rock and the existence of huge boulders, the ***erratics,*** supported the theory that

there had been a significant drop in temperature that resulted in a massive sheet of ice that covered much of the land. He published his second work in 1840. This publication garnished him the title of the ***father*** of the **Ice Age** theory despite earlier work by **Charpentier** and **Schimper**.


Louis Agassiz (1807-1873)

People embrace what they **WANT** to hear - not reality. This is why Hollywood preferred movies that portrayed everybody lived ***happily-ever-after***. It is how humans cope with reality. The **Ice Age** theory is a classic example. It is taught in school as if it were fact. **Agassiz**, however, failed to explain **HOW** or **WHY** temperatures fell so sharply in the first place. That would require some other event he never touched on. **Agassiz** hinted only at some intense climatic change without addressing the mechanism. Silently in the wings, **Agassiz's** theory was being questioned, despite the fact it was being taught as part of the historical record of earth. Some began to question what made the ice move southward. One theory was that there had been an uplifting geologically in the North Pole region that tilted the land causing the ice to flow southward like water rather than simply build up deeper and deeper in the North. No uplifting has ever been discovered. Then there was the evidence that emerged from drilling ice core samples. Suddenly, these ice cores revealed a cyclical nature to earth's history rather than some perfect world of boring ***uniformity*** where the future is always the same as the past. The ice cores revealed there were interglacial periods with warming trends where plants and animals appeared. Now there were cycles within this **Ice Age**. Still, the **Ice Age** theory held due to the fact that it was slow moving and if an **Ice Age** reappeared, by the time it reached your backyard, it might still take 10 years to reach your house. That kept the **Ice Age** theory in the camp of the ***uniformitarians***.

This clash between ***catastrophe*** and ***uniformity*** permeates everything. It is mankind's need to sleep at night. Change is the greatest fear of all. The **Ice Age** theory has never been explained in detail. What caused it? Since ice does not move like water and cannot flow freely to ascend hills, then what made it flow southward rather than simply snow in the south and build there independently? There will always be a real mystery behind it based upon grooves and erratic boulders. It does not explain the Siberian discoveries at all and appears to leave logic and reason behind in the desperate need to rebut the **catastrophist** view of sudden dramatic violent change. Even in economics and politics, the ***uniformitarian*** view does not explain the sudden burst of civil unrest we label revolution.



Sir Isaac Newton (1642-1727)

Edmund Halley (1656-1742)

Christiaan Huygens (1629-1695)

Yet the **catastrophists** could claim greater influence in the birth of the field of physics. **Sir Isaac Newton** (1642-1727) developed his laws of gravity and was inspired by his friend to publish the work who underwrote the project, **Edmund Halley** (1656-1742). This was the same **Halley** who discovered the cyclical nature of comets. **Halley** believed that the comet that carries his name was the same comet reappearing throughout history at regular intervals recorded by contemporary historians of all ages. **Halley** saw hidden within history, the same periodic intervals of a comet. **Christiaan Huygens** (1629-1695) discovered that light traveled not in a uniform motion as a straight line, but in a cyclical pulsating motion of cyclical waves, albeit at a constant speed. Suddenly, there could be a steady ***uniformity*** to the speed of light, yet simultaneously, there was a violent swing of extremes within it taking place in a cyclical manner. This was the same pattern that emerged in the ice core samples. There may appear to be ***uniformity*** in the macro world, but cyclical violent swings at the micro level that could erupt catastrophically.

William Whiston (1667-1752)

It was **William Whiston** (1667-1752) who was ordained as an Anglican priest in 1693 and wrote ***A New Theory of the Earth*** published in 1696 in which he argued that the biblical stories-such as creation, the great deluge (flood), and ultimately the conflagration could all be explained scientifically. In 1701, **Whiston** returned to Cambridge where he became an assistant to **Sir Isaac Newton**. **Whiston** succeeded Newton in his professorship at

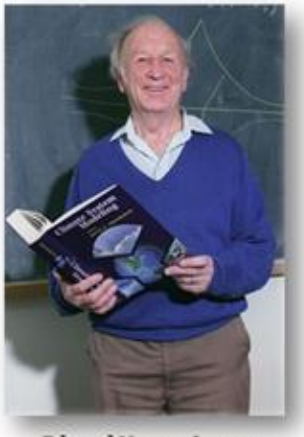
Cambridge in 1703. He eventually ascribed to the unpopular Arianism that rejected the idea that Christ was actually divine. This belief cost him his professorship at Cambridge in 1710. Nevertheless, the influence of both **Newton** and **Halley** is clearly reflected in his work. He argued that the Deluge, or Great Flood of Noah, had actually been caused by an external source he saw as the passing of a comet that came so close to earth, the gravitational effect was to displace the oceans causing them to overflow. **Whiston's** theories, however, predate the Siberian discoveries illustrating that there was a fertile period of expanding investigation and knowledge. **Whiston** published a work in 1717 ***"Astronomical Principles of Religion, Natural and Revealed, in Nine Parts - the cause of the Deluge."*** (xxxii + 305p). We can see that the catastrophist view appears to have emerged first in the late 1600s. Therefore, upon the first Siberian discovery in 1772, the cyclical nature of even light and life itself in the late 1600s now increased in magnitude whereby the swings could be quite violent. **Whiston's** view that the Deluge involving Noah was caused by an external force displacing gravity, illustrated the catastrophist view albeit quite speculative.

This entire line of investigation and theories of ***Ice Ages*** are directly linked to the same historical event of the flipping of the poles. Only several decades later after Lyell, did the idea of the Earth's magnetic field began to be understood. These theories were beginning to emerge suggesting that the Earth's field might have reversed in the remote past. However, at first many sought to dismiss the idea as absurd. Yet, there was no real concrete proof that the ***Ice Age*** was caused simply because the ice decided to flow south. Erratic boulders and groves in rock do not prove the flow of ice southward. Most ***Paleomagnetic*** research in the late 1950s began to include a closer examination of the wandering of the poles and continental drift. Although it was discovered that some rocks would reverse their magnetic field while cooling, it became apparent that most magnetized volcanic rocks preserved traces of the Earth's magnetic field at the time the rocks had cooled. In the absence of reliable methods for obtaining absolute ages for rocks, only led many to assume these shifts took place in millions of years.

There was no major advance in understanding these Earth magnetic polarity reversals until the developments in techniques for radiometric dating were developed in the 1950s. Allan Cox and Richard Doell, at the United States Geological Survey, began to investigate was there a regular cyclical pattern to these magnetic polarity reversals. It was at this time when they invited geochronologist Brent Dalrymple to join their group. This was the group that first produced a magnetic polarity reversal timing map in 1959. As the available data expanded, they continued to refine this timing map. However, Don Tarling and Ian McDougall of the Australian National University were now also interested in this area of investigation. Suddenly, the field of investigation into Earth magnetic polarity reversals greatly expanded. Neil Opdyke at the Lamont-Doherty Geological Observatory also now showed that the same pattern of Earth magnetic polarity reversals existed within sediments from deep-sea cores expanded the

database. Now investigation of the Earth's magnetic polarity reversals and field was gathered largely by means of research vessels on the high seas.

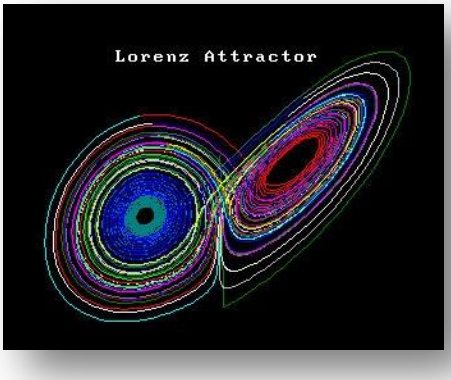
Indeed, the 20th century will be remembered for four scientific revolutions--Relativity, Quantum Mechanics, Geology, Chaos and Fractal Geometry. Much like the discovery of Chaos where patterns suddenly emerged from what appeared to be random data unexpectedly what emerged from the data once plotted on a map was shocking. It quickly became apparent that remarkably regular and continuous magnetic stripes emerged from the ocean floor.



Edward Norton Lorenz
(1917–2008)

The Father of Chaos Theory is Edward Norton Lorenz (1917–2008) who was an American mathematician and meteorologist. Lorenz was certainly **THE** pioneer in ***Chaos Theory***. A professor at MIT, Lorenz was the first to recognize what is now called chaotic behavior in the mathematical modeling of weather systems.

During the 1950s, Lorenz observed that there was a cyclical non-linear nature to weather yet the field relied upon linear statistical models in meteorology to do weather forecasting. It was like trying to measure the circumference of a circle with a straight edge ruler. His work on the topic culminated in the publication of his 1963 paper ***Deterministic Non-periodic Flow*** in the Journal of the Atmospheric Sciences, and with it, the foundation of chaos theory. During the early 1960s, Lorenz had access to early computers. He was running what he thought would be random numbers and began to observe there was a duality of a hidden repetitive nature. He graphed the numbers that were derived from his study of convection rolls in the atmosphere. What emerged has been perhaps one of the most important discoveries in modern time.



This illustration of the ***Lorenz Strange Attractor*** is incredibly important and was first reported in 1963. Lorenz's discovery of a strange attractor was made during an effort to create a model of weather patterns. The actual experiment was an attempt to model atmospheric dynamics of the planet. It involved a truncated model of the **Navier-Stokes** equations. It is a visual example of a non-linear dynamic system corresponding to the long-term behavior in a cyclical manner revealing a hidden order we cannot otherwise observe.

Lorenz also discovered in 1969, that very minor differences in a dynamic nonlinear system could trigger vast and often unsuspected drastic results. These observations ultimately led him to formulate what became known as the term ***Butterfly Effect*** in 1969 regarding this fascinating discovery. Very tiny changes in what might appear to be minor data at the outset had a ripple effect throughout the entire system creating substantially different outcome. This term grew out of an academic paper he presented in 1972 entitled: "***Predictability: Does the Flap of a Butterfly's Wings in Brazil Set Off a Tornado in Texas?***"

These discoveries whereby Earth itself had been subjected to cyclical changes had profound effects in many fields. Certainly not the least was the discovery of the Earth magnetic polarity reversals. In 1963 Frederick Vine and Drummond Matthews provided a simple explanation by combining the seafloor spreading theory of Harry Hess with the known time scale of polarity reversals. Since new sea floor is magnetized in the direction of the field at the time it was formed from molten lava, then it will change its polarity when the field reverses. Hence, sea floor spreading from a central ridge will produce magnetic stripes parallel to the ridge. The field was taking shape. Others, such as Lawrence Whitaker Morley (b 1920), also proposed a similar explanation independently in January 1963. His paper, Palseomagnetism as a Means of Dating Geological Events with A. Larochelle of the Geological Survey of Canada, was a classic. However, academia was just not ready for prime time. His work was rejected by the scientific journals ***Nature*** and ***Journal of Geophysical Research***, and remained unpublished until 1967.

The resistance to the very idea that the polarity of the Earth's magnetic field reversed was the product of the uniformity crowd. If they do not want to believe in something, they just refuse to address it. However, the evidence was clearly winning converts. Finally by 1966, Lamont–Doherty Geological Observatory scientists found that the magnetic profiles across the Pacific-Antarctic Ridge were symmetrical and matched the pattern in the north Atlantic's Reykjanes ridges. The very same magnetic anomalies were being discovered over most of the world's oceans. This simply could no longer be ignored by the academic community that resists change.

By 1971, W. A. Robertson and W. F. Fahrig wrote a paper: ***The Great Logan Paleomagnetic Loop — The Polar Wandering Path from Canadian Shield Rocks During the Neohelikian Era.*** It just could not be ignored any longer. Geomagnetic polarity has been going through reversals no different than what takes place on the Sun, but instead of 11 year cycles, it appears to be 720,000 year cycles. Today, Past field reversals can even be discovered within the "frozen" ferromagnetic minerals of consolidated sedimentary deposits or cooled volcanic flows on land. However, when we are looking at the data from the seabed, there is a limitation. No existing sea floor is more than about 180 million years old because of the movement of the sea floor being thrust under continental plates.

Other methods are employed for detecting older reversals. The majority of sedimentary rocks incorporate tiny amounts of iron rich minerals. These have an orientation that is determined by the current position of the magnetic field when they are formed. Consequently, these types of rocks can preserve a record of the then current location of the Earth's magnetic polarity field. We must keep in mind that the magnetic field is global, and thus the results are the same in all regions, which has made it impossible for the uniformitarians to deny the existence of the magnetic variations throughout geological history.

So far, the data reviewed for this work shows a Geomagnetic Polarity Time Scale (GPTS) that spans the last 83 million years. However, within that, there are a total of about 184 polarity intervals of change. This produces an average of 451,086 years. However, based upon intensity, the actual cycle appears to be 720,000, making us a bit overdue. There were periods where the reversal was highly active (intensity) flipping polarity 5 (five) times within just 1 million years. Other periods showed 10 (ten) reversals within a 4 million year period. This is the normal course for a dynamic cycle. It builds in intensity and thus when that happens, the reversals increase both in magnitude as well as frequency. There are also two periods of at least 10 million years where the polarity did not reverse. Therefore, it is a purely cyclical model that is dynamic in scope that fluctuates both in frequency as well as intensity. We have even seen this on the Sun where the sunspots have varied in the same manner.

The uniformitarians have chimed in and after admitting that magnetic polarity reversals do take place, they insist that the duration of a "polarity transition" may vary between 1,000 and 10,000 years. This is an attempt to minimize the importance of this phenomenon after they were wrong to start with. If we take the current movement of 40 miles per year, given the circumference of the Earth is 24,901 miles, at the current pace 1,000 years would be enough for the poles to reverse almost twice.

There have been studies of lava flows at Steens Mountain in Oregon. They indicate that the magnetic field could have actually shifted at a rate of up to 6 degrees per day about 15 million years ago. Hence, the uniformitarians keep trying to minimize this phenomenon rather that try to explore the real consequences of what takes place when it does occur. The uniformitarians simply always adopt skepticism. It is purely an opinion as some differ on the existence of God, who he is, and what is his objective. From the data reviewed objectively by the computer, it appears to be more abrupt and the normal cycle is about 720,000 years. One thing is certain = the magnetic field will not simply vanish. The polarity will reverse as we see it does on the Sun, just at a much greater interval. The magnetic field of the Earth, is generated by dynamo-like action in which convection of molten iron in the planetary core generates electric currents which in turn give rise to magnetic fields. Clearly, polarity reversals are an inherent characteristic of this process.

Richard A. Muller, a professor of physics at the University of California, has argued that geomagnetic reversals are not spontaneous processes but rather are triggered by external events that directly disrupt the flow in the Earth's core. His reasoning seems to be the same as it once was in medicine that disease is caused by some external influence rather than as we now understand is largely genetic. On July 28th, 2012, Muller wrote an Op-Ed for the New York Times entitled ***The Conversion of a Climate-Change Skeptic*** where he sates he is now also convinced that "Humans are almost entirely the cause" of global warming. He appears to be a skeptic about nature just may be more powerful than man. Ironically, Muller offers little but just opinion. The most striking evidence against his opinion that might not even make it the level of theory is there is absolutely no evidence for a magnetic polarity reversal that is connected with the impact event that caused the Cretaceous–Paleogene extinction event. This seems to be simply opinion.

There are clearly investigations that began on this idea that perhaps it was a geomagnetic polarity reversal that might have caused massive extinctions. Again, some have argued that during a reversal event, the Earth's magnetic field would be much weaker. Under this notion, high energy particles trapped in the Van Allen radiation belt could perhaps then reach Earth killing life. If the Earth's magnetic field did not exist, it is true that the atmosphere could become saturated with high energy particles. There is some evidence that to a marginal degree, some particles do enter the atmosphere during reversals. Others have argued that Mars may have lost its atmosphere by the collapse of its magnetic field during a reversal event. The National Geographic News reported on May 11th, 2009 that now a new computer model suggests Mars's magnetic field may have been slowly weakened by four especially large impacts of asteroids and then snuffed out completely by a fifth and final blow. Other celestial bodies also have geomagnetic forces, fields and reversing poles. Today, the only other 'direct' information that Martian magnetism is from a special class of meteorites known as the SNC meteorites (q.v.) which are thought to come from Mars. Magnetic field analyses of these possible samples of the Martian crust indicate that magnetic fields of may have been present on the surface of Mars at the time that these meteorites were ejected by a giant impact some 180 million years ago. Something seems to have caused Mars to apparently experience a magnetic crisis in its geological history. It is clear that impacts are not necessary to cause a reversal of polarity. However, they perhaps could have killed the magnetic field of Mars, which is an entirely different question. Yet, these are purely ideas and opinion. There is no hard evidence to support what that the atmosphere would be sucked away and we would all die. Nor is there evidence that a polarity reversal would change weather patterns or spark a new Ice Age. No one really knows the answer to these questions. Hence, they remain possibilities for future exploration.

Chapter XIV

The Mayan established their Long Count Calendar which in particular has been the subject of intense debate as to its relationship to a ***galactic alignment*** that is herald by some to be the ultimate doom and gloom forecast for humanity. Why some people always have to wish such devastation upon society is hard to say. Nevertheless, the facts do not support the end of the world as they pretend. It should be noted that there has been a discovery in Crete of carved stones dating back more than 130,000 years demonstrating that man has been around for a very long time. This alignment with a future conjunction is forecast for the 21st of December 2012

AD. It will not be the end of the world or time so you better still pay your taxes. In fact the alignment of three primary celestial objects, the earth at winter solstice, the sun, and the equatorial plane of the ***Milky Way*** galaxy, will all align on this date in an event that certainly does not occur every year, but rather once every 25,800 years due to a very subtle celestial motion called ***Precession of the Equinox***. Yet, visually twice each year we can see an alignment of the earth, the sun, and the galactic equator crossing earths Ecliptic Line. To argue that some profound violent event is about to happen cannot be supported by documented earth history on such a short time scale.

Indeed, the Mayan Long Count calendar in particular has been linked to the "***New Age***" movement of the recent era where people have dug up beliefs that the earth, as part of its natural cycle of existence, lives through a series of successive "world ages", with each separated by some sudden physical planetary upheaval. We find the story of a great deluge that destroyed the world among the Maya. The Popol Vuh, the sacred text of the Mayan civilization, also tells of a flood that destroys the Maya and was a punishment for their impiety. They were the second of three successive races of men. It takes the form of a rain of fire followed by a darkening of the sky and a "dark rain" which is not actually specified. The last time the Mayan calendar ended it was called by the Mayans as a period of water. Some historians seem to think that the Mayans were referring to the biblical reference of Noah and the ark.

Of course there is the Biblical story of Noah and his ark. Genesis (7-6) dates the Flood as year 600 in Noah's life, or, according to the Bible, 1656 years after the creation of Adam and 2348 years before the birth of Christ according to the chronology of James Ussher. The problem there is time. Many Egyptian buildings were built around 2700BC and 2500BC, long before the expected date of the flood. These Egyptian pyramids showed no damage that could have been causing their total immersion for many months underwater. There is no sign of water damage even in the historical relics discovered in the caves of Lascaux of Chauvet, of Altamira. Nonetheless, the only object showing water damage is the Sphinx where it is argued the face was recut by the Egyptians and that it was originally really a lion that pointed to the constellation Leo around 10,000BC. The water damage appears to be caused by erosion from rainfall according to geologist Robert Schoch of Boston University.

The last glaciation period, which ended at about 8000BC was likely followed by its opposite interglacial period giving rise to the stories of the flood. Perhaps the end of a glaciation period corresponds to a phase transition where the ice turns to water. Indeed, there is the issue of the

White Earth effect where solar energy is reflected by the surface ice on the Earth lowering the temperature due to the reflection rather than absorption of solar energy. Therefore, perhaps a phenomenon of a phase transition creates a catastrophic flood, which would be violent and extend over a relatively short period of time. Keep in mind, however, an interglacial period is a geological interval of warmer global average temperature lasting thousands of years that separates consecutive glacial periods within an ice age. The current Holocene interglacial period has persisted since the end of the Pleistocene Age, or about 11,400 years ago.

The story of Noah is similar to the story of Gilgamesh who in old Sumerian texts is a heroic character of Mesopotamia and the ancient king of the city of Uruk. He reigned about 2650 BC. He is the main character of several epics. The most famous is the Epic of Gilgamesh, circa 1700BC, which was a story about the wrath of the great gods, who sought to depopulate the earth because men disturbed the peace of the gods. There is the building of an ark with specimens of every living being. For six days and seven nights, storms, heavy rain, thunder, lightning and hurricanes broke the Earth as a jar. The gods took shelter in heaven of Anu. On the seventh day, the sea calmed down and stopped, and the ark landed on Mount Nishir. The dove was released and returned as did a swallow. Finally, a raven was released which did not return because the waters subsided.

By no means is the story of the flood confined to just the Mesopotamian region. What does exist is a belief that there is a universal myth about a great flood that was transmitted by a founding population. We do find the story of the Great Flood in almost every ancient culture. The first Greek deluge in mythology was the Ogyges, which was caused by Zeus and leaves only two survivors, Deucalion and Pyrrha. The myth of Atlantis reported by Plato in two of his dialogues, we find Timaeus and Critias who tell us of the sudden flooding of an island that sinks under the sea. Plato informs us of a flood in his book I entitled the ***LAWS***, where only mountain dwellers survived.

The Avesta, which is the Iranian Zoroastrian sacred test, is a transcription of oral histories that are of very ancient origin. This text does not specifically describe a deluge. Nonetheless, it includes stories of the flood and the vision of a just man. The hero is warned by the god Ahura Mazda of impending climate catastrophe that will include the destruction of man and the saving of only a handful of men, from which the tribe of Medes was initially established.

In Norse mythology there was the death of Ymir. In the creation myth, Odin was enraged by the brutality of Ymir and killed him and threw him into the chasm known as the Ginnungagap. The flood is then caused by the blood that was so great it killed all the giants, except for the small son of Ymir and his wife who then repopulate the world.

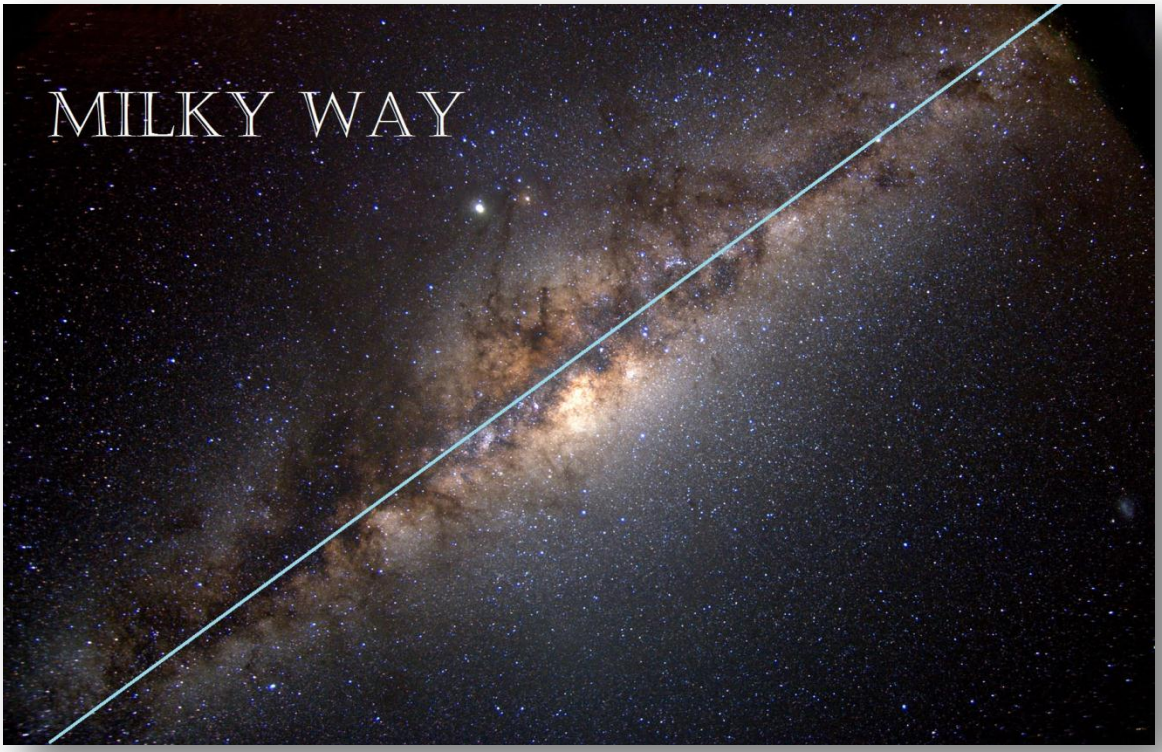
The Flood Lithuanian legend the flood has several versions. One was sent by the god Prakorimas to exterminate the race of giants that inhabited the earth. He then has pity for the last couple of old giants that are drowning in the flood and Prakorimas throws them a nut shell as a boat. The Giants then create humanity on the advice of Laima, the goddess of fate.

In Hinduism, the sacred Veda text suggests the first man Manu is saved by the first avatar of Vishnu, Matsya. He also escaped the deluge by building a boat. Manu later became the first legislator of Hinduism. Even the Qur'an describes the flood story as a major historical event. (Koran LXXIX: 11-12). There is also the story of a flood in China. Several mythic texts contain a dialogue about a flood of "High Water" that rises to heaven. There is no direct myth of the Flood and the repopulation of the earth.

Some argue that the Mayan Long Count calendar system was established in ancient times to forecast these very transition points between world ages. There is no real evidence of that for the Precession of the Equinox being about 25,800 years does not correlate with the destruction of the earth at such regular intervals. Indeed, the primary recurring cycle of the Long Count calendar has been found to consist of precisely 1872000 solar days of approximately 5125.36 years. Five of these intervals equal 25,626.8 years. Hence, the Long Count does not exactly line up with the Precession of the Equinox no less regular destruction sequences in earth's historical record. Yet, this is the period of time that has been held to be the very duration of each successive ***World Age***.

It is clear that this cycle was viewed by the Maya as fortuitous to begin new cities. Still, the Long Count inscriptions found at various ancient Mayan settlements, suggest that they believed the current ***World Age*** began on 11th of August, 3114 BC basis the Gregorian calendar. Assuming this is the correct start date, therefore the current ***World Age*** will conclude precisely on 21st of December, 2012 AD.

From this basis, what emerges then is this ominous "***galactic alignment***" that is proclaimed to be a profound event in the heavens. It has been portrayed as a space phenomenon that is of monumental significance. It happens when the equator of the sun, the equator of the Earth, and the equator of the ***Milky Way*** galaxy are all completely aligned. Over the last thirty five hundred years, Earth has slowly but surely drifted towards the center of the ***Milky Way*** galaxy. The ***galactic alignment*** happens on the Winter Solstice. Curiously, the fact that the Mayan Long Count calendar ends the same year as the ***galactic alignment*** are all due to happen around the same time, has sparked many wild theories. Keep in mind the earth is far older than 25,800 years and it will be by no means the end of times.

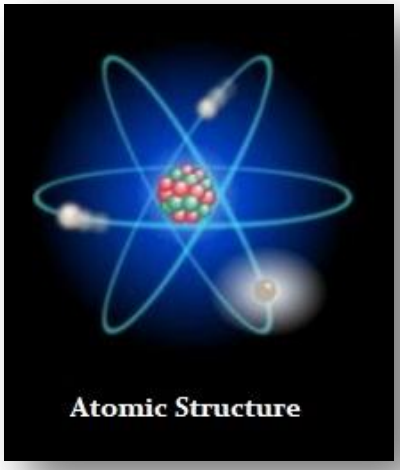


The ***Milky Way*** is classified as a spiral galaxy, meaning that the whole body of stars continuously rotates about the center point. Everything is fractal. The very structure of the atom is the same design regarding a solar system or the ***Milky Way*** at the galaxy level. Then there are multiple galaxies moving away from a center point they call the ***Big Bang***. The sun itself, which is but one of many millions of stars that structure the ***Milky Way***, is located some 28,000 light years from the center in a part of the galaxy where the actual thickness is only about 700 light years. The ***Milky Way***, being some 20 light years deep, is a significant distance from the actual equatorial plane of the sun, and thus the whole solar system, within what is called the Southern Hemisphere.

Since we visually can see twice each year an alignment of the earth, the sun, and the galactic equator crossing earths Ecliptic Line at the summer and winter solstice, we must question if this purported ***galactic alignment*** will be really significant or just symbolic. Each time the earth is either between the sun and the galactic equator, or (exactly 6 months later) the sun is between the earth and the galactic equator. In astronomy it is an observable fact that all background stars have an apparent yearly orbit about the earth of some 365.256363 days, known as the sidereal year, which is slightly longer than the solar year. This is the length of time they require to accomplish one complete cycle with respect to the earth orbit. This is in contrast to the time taken for the earth to orbit about the sun with respect to its seasonal markers – the solstice or equinox points. In this instance, the noted separation time is that of the tropical year of 365.2421840 days. Due to this time discrepancy between the two different types of earth year, there is a continuous "slippage" of all of the seasonal markers of the earth's orbit, against the whole background star field outside the solar system including all of the stars that make up the ***Milky Way*** band. This phenomenon, called the Precession of the Equinoxes, is critical in understanding the Mayan 2012 ***galactic alignment***.

If you were to look up at the ***Milky Way*** during the winter solstice of 500 BC one could see the sun markedly off to the west of the galactic equator. If we start from this initial configuration then as every year thereon passes, due to processional slippage and the earth returning to its next successive winter solstice point, the sun will appear to move eastwards against the seemingly fixed galactic background. So from the winter solstice date of 500 BC, the full angular distance covered to place the sun on the exact intersecting point of the ecliptic and galactic equator, in conjunction with the earth upon a future winter solstice, is approximately 34 degrees and 35 minutes of an arc. It is precisely this angular distance covered right up to the date determined to be December 21, 2012.

The real question becomes just what does happen at a ***galactic alignment?*** Looking at our illustration, at position A is where our sun (and solar system) was in the ***Milky Way*** 3,000 years ago. Position B shows our sun's position 1,500 years ago. And position C is where our sun will be on December 21st – 23rd, 2012. This is also called the December Solstice, when our whole solar system aligns perfectly in the center of the ***Milky Way*** Galaxy – a ***galactic alignment***.



NASA CENTER OF MILKY WAY

Then there is the theory of the Black Hole that is argued to be at the center of the ***Milky Way*** galaxy, which of course the claim is one of the most massive and dense black holes known to man. Since a black hole is a massive ball of energy that is so dense that it sucks anything near it into itself by its sheer force of gravity that not even light can escape. It is purported to be over 27,000 light years long and 4 million times the size of the sun. Then they argue that the ancient Mayans named the black hole "***Xilbalba***" meaning fear, which was one of the many Mayan gods that represents death and the underworld. Then they claim many ancient cultures believed that this black hole was a portal for demons to enter the world.

Some then claim that the sun will rise on December 21st, 2012 in the sky where this black hole is located and we will all be sucked into the black hole. Then there are those idiots who suddenly discovered that the earth wobbles and assumes that means it is out of control and will wobble into the black hole. Of course, since the earth has always wobbled and it has followed this path regularly, this takes place every 25,800 years or so this has taken place before many times. So if you are one of those people who insists the end is near, don't pay your taxes, have a party, don't worry, just be happy for you will never have this stress again if you are right.

NASA reported in October 2012 that its Swift satellite had found evidence of the presence of a previously unknown stellar-mass black hole in our Milky Way galaxy. Named Swift J1745-26 after the coordinates of its sky position, the nova is located a few degrees from the center of our galaxy towards the constellation Sagittarius, NASA said.

While astronomers do not know its precise distance, they think the object resides about 20,000 to 30,000 light-years away in the galaxy's inner region. The satellite detected a rising tide of high-energy X-rays from a source toward the center of Milky Way and the outburst, produced by a rare X-ray nova, announcing the presence of the black hole. Indeed, a bright X-ray novae is so rare that they are essentially once-a-mission events and this is the first one Swift has seen, according to the mission's principal investigator, at NASA's Goddard Space Flight Center.

An X-ray nova is, however, a short-lived X-ray source that appears suddenly, reaches its emission peak in a few days and then fades out over a period of months. The outburst arises when a torrent of stored gas suddenly rushes toward one of the most compact objects known, either a neutron star or a black hole. Ground-based observatories detected infrared and radio emissions, but thick clouds of obscuring dust have prevented astronomers from catching Swift J1745-26 in visible light. NASA must wait for the X-rays to fade away before they can measure the mass and confirm it is in fact a black hole. Of course, claims have circulated that this is the biggest ever and suck us all into oblivion. Why everything has to be the end of the world is baffling. If it is over – it is over and you won't have worry about anything again.

Then there are those who claim that the ***galactic alignment*** will cause massive outbursts of energy from the sun resulting in us being fried in a giant solar storm. The sun has a 300 year cycle in energy output between peak and minimum with a fluctuation of about 15%. We have experienced solar storms all the time with the largest recorded taking place in 1859 and 1921. There is just no evidence that we will ever be fried in such a manner until the sun goes supernova.

Then of course are the prognostications that the world will end during this ***galactic alignment*** from a geomagnetic ***pole-shift***. Again, in this scenario, the earth's polar axis "wobbles" as the magnetic north pole becomes the south. This they argue will cause some major cataclysmic disaster with the tectonic plates to colliding, triggering huge earthquakes, volcanoes, and naturally massive tsunamis. This ***pole-shift*** has a cycle from the data of 720,000 years and while this is due, there is no evidence that some end of the world scenario is likely. There is the potential for climates to change, but keep in mind the evidence does not suggest the world comes to an abrupt end.

The claims that during previous ***galactic alignments*** the ***pole-shift*** happened so quick that many ancients who were unaware were wiped out immediately simply because they were not prepared. How is this claim supported if no one survived to record the event? The geological evidence does not support a ***pole-shift*** during the last 720,000 years so since recorded history extends back only 6,000 years, this claim seems again just made up to sell books and wish the retribution of some god upon the whole of humanity because the author is someone short-changed in life compared to everyone else so it is get-even time.

There is no hard evidence to support the theory that the atmosphere would be sucked away and we would all die in the blink of an eye during a magnetic ***pole-shift*** as discussed previously regarding Mars, which did lose its magnetic fields. However, that appears to have been caused by a severe impact of asteroids rather than a magnetic ***pole-shift*** that is normal and takes place on the sun every 11 years without it blowing itself out.

And for those who claim the ***pole-shift*** would cause a modern day ice age, perhaps has more support for that idea, despite the absence once again of hard evidence. The idea that countries that normally experience cold weather would have tropical like paradises and the tropical paradises of today will freeze may be more of a good sales-pitch for real estate brokers trying to sell deserted houses in Detroit. Yes it is even true that the polar ice caps have been melting and ships can now sail across the top of the globe. However, this is caused by the natural 300 year cycle in the energy output of the sun, not the pre-stage for a ***pole-shift***. As we move into the peak output on this cycle and then turn down toward global cooling as existed during the late 1700s when Washington crossed the Delaware River, which has never been frozen in my

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lifetime. No doubt when the weather turns down to global cooling again this will be somehow attributed to the Mayans.

Nevertheless, this theory of global warming being caused entirely by man is just another absurd theory to support a hidden agenda for other reasons or is put forth by people who are ignorant that we live in a dynamic world where everything moves in a cyclical nature. I attended the National Press Conference dinner in Washington, DC with a friend of mine Richard Fox who was Chairman of Temple University. We were seated with a heads of environmental groups who assumed being attached to Temple University meant they were in friendly territory. The conversation turned to the real agenda to reduce population growth. My friend bluntly asked them, whose grandchild were they trying to prevent from being born; theirs' or his?

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Clearly, the most significant factor driving the weather is the energy output of the sun. We will explore this aspect from a cyclical perspective tied to the economy of mankind. The work of Sallie Baliunas is highly important in understanding the

long-term interaction between weather and the economy. As I have stated previously, she gave a presentation at the Foundation for the Study of Cycles which was quite enlightening. Her conclusion to her June 5th, 2001 review at the George C. Marshall Institute, Washington, D.C. stated bluntly:

Summary and Conclusions

"The climate record shows that the global warming of 1°F observed over the last 100 years is not unusual. Global temperature changes of this magnitude have occurred frequently in the past and are a result of natural factors in climate change.

But is it possible that the particular temperature increase observed in the last 100 years is the result of carbon dioxide produced by human activities? The scientific evidence clearly indicates that this is not the case.

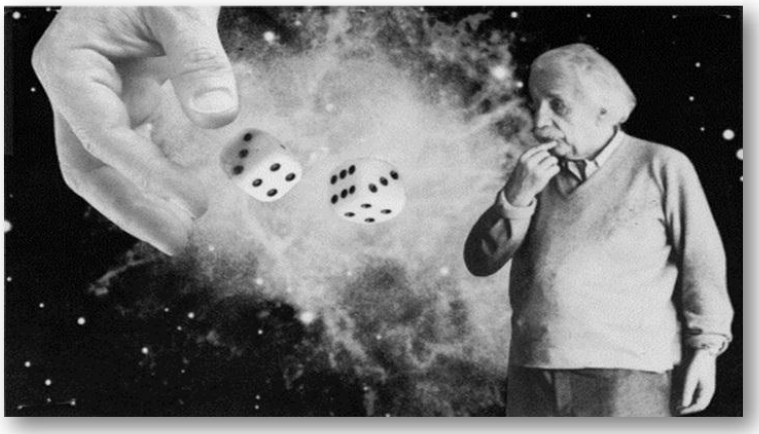
All climate studies agree that if the one-degree global warming was produced by an increase in carbon dioxide in the atmosphere, the additional CO2 first warms the atmosphere, and the warmed atmosphere, in turn, warms the earth's surface. However, measurements of atmospheric temperatures made by instruments lofted in satellites and balloons show that no warming has occurred in the atmosphere in the last 50 years. This is just the period in which human made carbon dioxide has been pouring into the atmosphere and according to the climate studies; the resultant atmospheric warming should be clearly evident.

The absence of atmospheric warming proves that the warming of the earth's surface observed in the last 100 years cannot be due to an increase in carbon dioxide in the atmosphere caused by human activities. The recent global warming must be the result of natural factors in climate change."

Everything about life is a cycle. We are born, grow, live, and die. This is how nature simply functions. Those that see dire catastrophes are fixated with the idea that we must be punished for simply existing. There are always two extremes such as good and evil, warm and cold, republicans and democrats, bulls and bears, even man and woman. It is the

existence of two opposites that makes life a cycle. There will never exist a period of just one thing. If that took place, all life would die. The planets revolve cyclically around the sun as our solar system revolves around in the Milky Way and as the Milky Way moves within the universe. This is simply how everything functions in a cyclical pattern.

Pictures of the structure of galaxies taken by NASA in its exploration of the heavens have demonstrated this cyclical structure in which we exist. Galaxies spin around a fixed point in the center. This is the same structure we find even at the atomic level. This is similar in structure to the discovery of Lorenz and his strange attractor when plotting weather data on earth. Everything functions in this cyclical structure and only the ignorant constantly argue for a linear straight line that typically leads to some catastrophe caused by man or a pending doom for us all.



It was Albert Einstein who said he could not accept that God is playing dice with the universe. In other words, there are rules by which everything functions. Galaxies do collide as pictured here taken by Hubble and there are black holes that suck things up. Simply put, there must always exist two extremes by which everything functions.

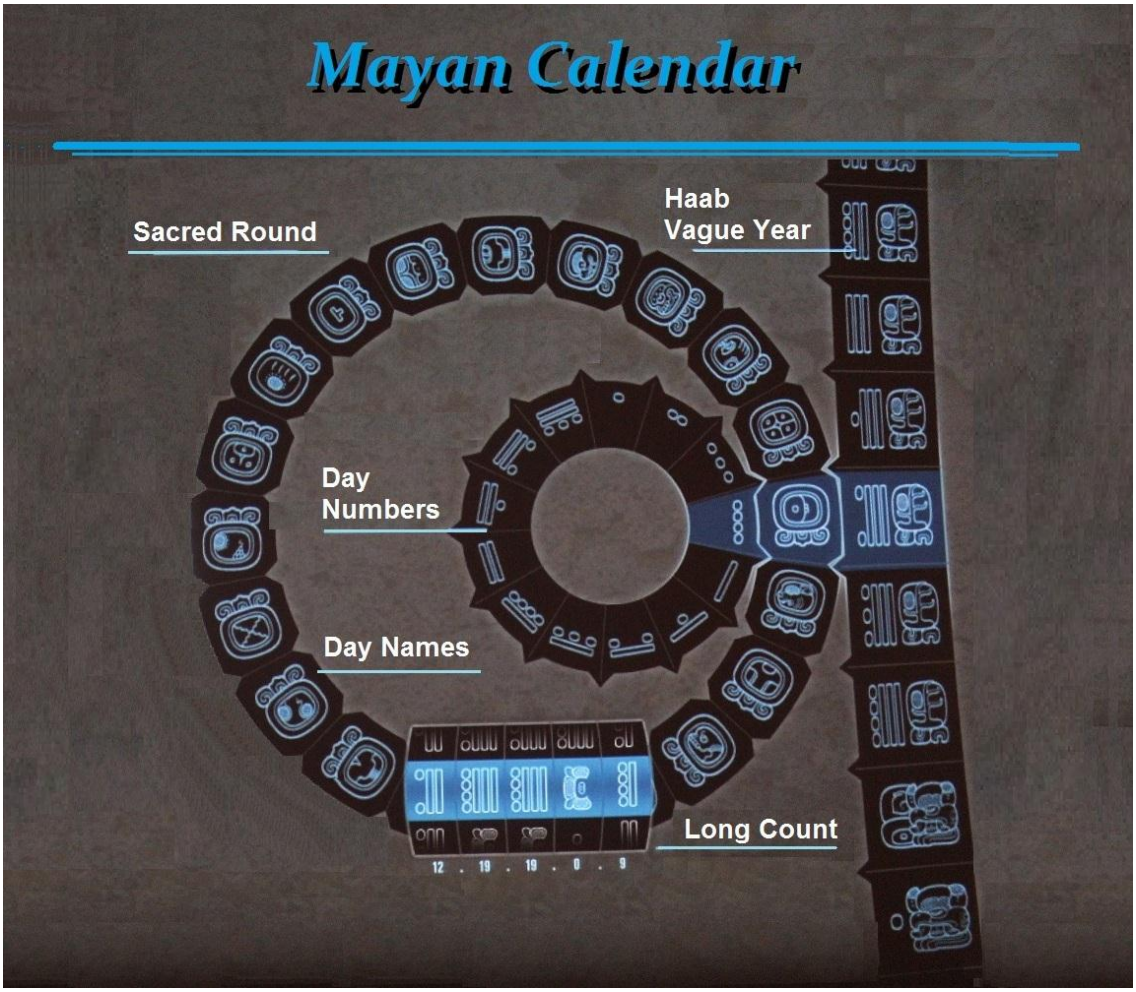
So is the End of the World written in the stars? Not likely. We have been here before and nothing drastic has ever happened. A collision with an asteroid is something much more likely to cause the wild scenarios of the end of the world as we know it. Other than that, sorry, we have crossed this path before with such a ***galactic alignment*** and the world did not end. As for pole-shifts, that appears to be a cycle that is due every 720,000 years and yes, we should see that in the near-term. Will that signal the end of the world? Not likely. Can some areas freeze suddenly? Perhaps that is how the mammoths were frozen in Siberia.

Chapter XV

The 13th Baktun

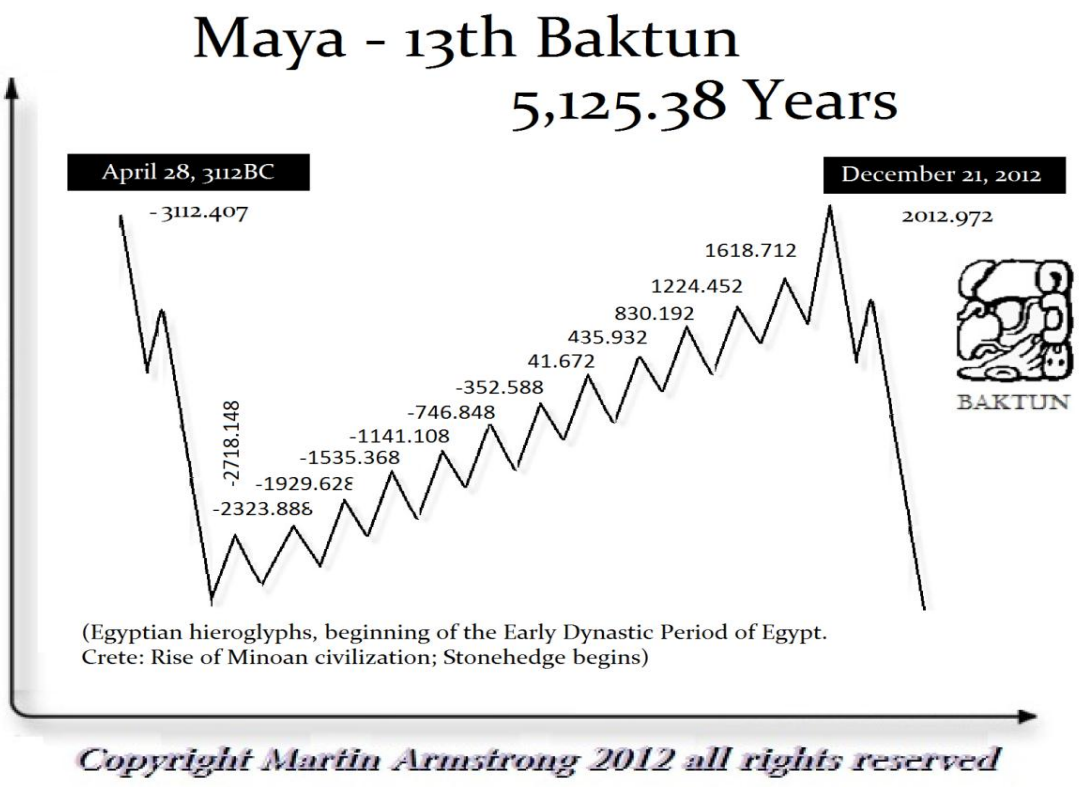
The Mayan Cycle that has captured the minds and soul of so many is broken down into what the Mayans had believed to be the cycle of time. Unfortunately, a lot of people have jumped on this Mayan event and distorted everything about it. Even extreme Christians have latched on to this target date claiming the Messiah will jump out of the sky and fire will destroy the earth and the heavens above as they were preaching for the year 1000AD. The basic cycle that everyone is fixated on is the baktun (properly b'ak'tun). This is 20 katun cycles containing 7,200 days on the ancient Maya Long Count Calendar meaning a baktun contains 144,000 days, equal to 394.26 tropical years in each baktun. A baktun was typically associated with religious rituals. They were important events that warranted the construction of a memorial stone marking the event. Such memorial stones are known for the end of the 10th baktun (10.0.0.0.0 on the Long Count or 830 AD) as is the case in Oxpemul. However, few are known from this time illustrating the collapse.

BAKTUN



The Classic period of Maya civilization occurred during the 8th and 9th baktuns of the current calendrical cycle. The current (13th) baktun will end, or be completed, on 13.0.0.0.0 (December 21, 2012 using the GMT correlation). This also marks the beginning of the 14th baktun, and this has been usurped as some sort of doomsday forecast. Given the fractal nature of time, one complete revolution of the ***Precession of the Equinox*** will take 65.43 baktuns. It is important to understand that the Mayan civilization did not begin and end with simply one baktun. The end of the 13th Baktun is merely 5125.38 years. This is hardly the end of all time.

Often many will read into other people's work some perpetual idea that supports their agenda. There has been no other trend that constantly reemerges as that of creating utopia where we will for once end all materialism and live peacefully in some communist state of bliss with no rights to property at all. Why this theme constantly resurfaces seems to be that those who do not want to work or lack the talent to be billionaires, want the playing field leveled so no one has more than them. However, this is really human nature that they are trying to alter and in that sense they are simply manipulators who distort the truth to justify what they think should exist.



This current Baktun that expires December 21, 2012 (2012.972) actually began in 1618.712. The fraction represents the percentage of the days in the year so December 21st is 0.972% of 365 days. If we go to the beginning of the wave based upon a 13 baktun count (5,125.38 years), which takes us to April 28, 3112BC, we arrive interestingly enough at a period where we see the rise of civilization as defined by creating a new age of political monarchy. We begin to see the rise of empires compared to mere urbanization. This has been constructed based upon the **Economic Confidence Model** whereby each wave builds in intensity.

c. 3200 BC King Iry-Hor reigns in Abydos, Egypt.
c. 3200-3150 BC reign of King Ka in Ancient Egypt.
c. 3150 BC: Narmer is the first pharaoh to unify Ancient Egypt.
c. 3125 BC: Narmer dies.
3102 BC: The beginning of Kali Yuga

Varna Necropolis: what have been claimed to be the earliest-known worked gold artifacts are manufactured.

Malta: Construction of the Ħaġar Qim megalithic temples, featuring both solar and lunar alignments. "Tarxien period" of megalithic temple construction reaches its apex.

Ancient Egypt:

Earliest known Egyptian hieroglyphs
Start of Early Dynastic Period of Egypt.

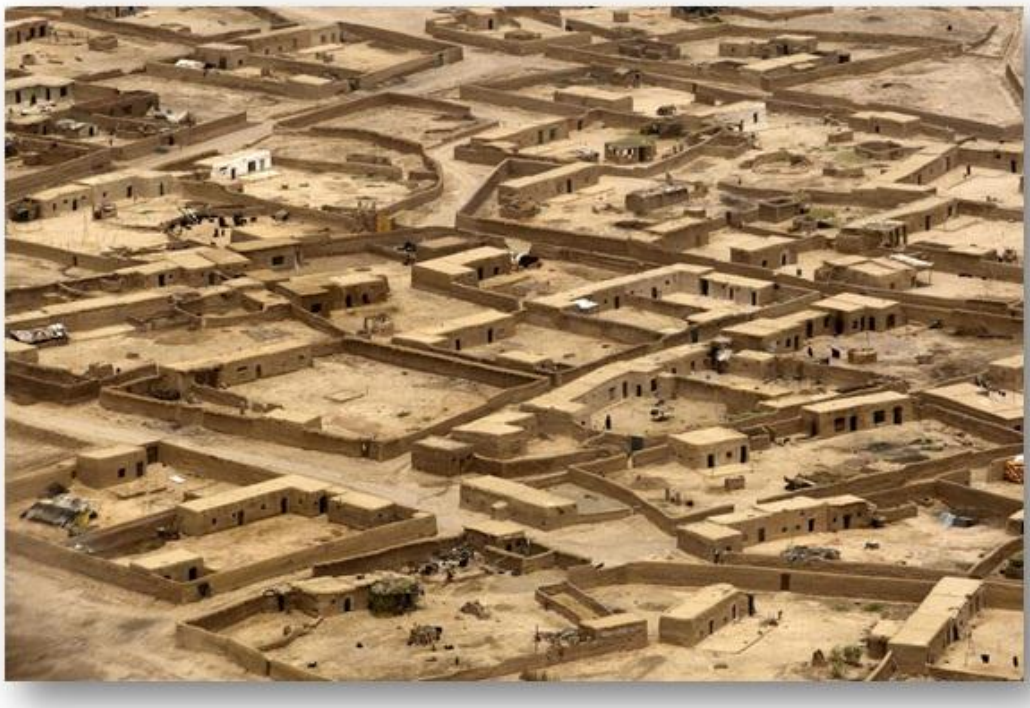
Crete: Rise of Minoan civilization.

Scotland: Neolithic settlement of Skara Brae in the Orkney Islands

Ireland: New Stone Age people build the 250,000 ton Newgrange solar oriented passage tomb.

c. 3100 BC:

England: The earliest phase of Stonehenge construction begins.



The Earliest Cities began to appear about 6700BC like Catal Huyuk

Those who want to change human nature call this entire cycle of 5,125.38 years the triumph of the Age of Materialism over bliss. They also claim that this was the Age of Great Forgetting of nature. In other words, it is claimed that this wave is where mankind lost his awareness of his true bond with nature by means of external possessions. This is where ego and domination became the predominant ambition of the civilized world according to their interpretation. This is very interesting, but a mythical view of history and a complete failure in understanding human nature. It was Niccolo Machiavelli (1469-1527) who effectively said that history repeats because the passions of man never change. This current 13th Baktun wave began with the rise of world trade and the formalization of empires based around monarchy. The previous 13th Baktun Wave (3112.407BC) still saw "materialism" since civilization began during that wave with the establishment of urban centers. Whether or not there were monarchies is debatable. One individual will always claim power has been sanctioned by some god over others.

The earliest city of ***Catal Huyuk*** from about 6700BC discovered in Turkey still shows houses with wall paintings and clearly materialism existed with trade guilds providing luxuries and others providing food so there was a urban class not engaged in farming and others who were hunting and gathering; so much for this current 13th baktun wave being unique and the Age of Materialism that will vanish on December 21st.

This is the interpretation of those who are still seeking the perfect world the same as communism where human nature is suppressed and everyone lives in some docile state of nirvana. The problem with such claims has been that to achieve an Age of Nature absent materialism requires altering human nature in the same manner as Karl Marx believed was possible by forcefully eliminating material wealth. This is just not practical. There are birds that compete for a mate gathering shiny objects and building a nest that is better than his competition. Crows and Magpies are famous for this, as are other members of the crow family such as jays. Starlings sometimes collect shiny objects, although they tend not to have them in their nests. Bowerbird males are the masters of seduction who lure their females into elaborately built bowers – true bachelor pads where the mating will take place. Once their goal is achieved, it is good-bye though since fatherhood is an alien concept to bowerbirds. Their nests are filled with flowers, shells and shiny objects and that is combined with persistent and masterful serenading. Are birds then materialistic since shiny objects make females fall for a night of pleasure and shiny objects are like giving diamonds to a mate? These arguments confuse political corruption with the mere possession of wealth.

This claim we have strangely forgotten nature is obviously instigated by the Industrial Revolution. Those that advocate such a world can still travel to Africa or parts of India and live in the bush with nothing yet enjoy their being one-with-nature.

Then there are those who claim that when Pope Gregory revised the calendar to a 12 month system (not true) that this was what they call the great "***Error in Time***". They argue that before the inception of the calendar by the Roman Catholic Church each year was divided into 13 moon cycles with 28 days each. This is simply not the case. The Romans named July for Julius Caesar giving it 31 days and August was named for his nephew Augustus and it too was given 31 days so he would not be inferior to his uncle taking days away from February. So where this nonsense comes from is really amazing because it is simply made up with no foundation in fact. They further argue that the most detrimental part of Gregorian calendar was the insinuation that time was something external, something inorganic and outside the body that we must watch and obey. They completely fail to understand time and give it some mystic quality

beyond contemplation. They further claim that the 7th century Mayan prophet Pacal Votan left a powerful message for future generations of evolution;

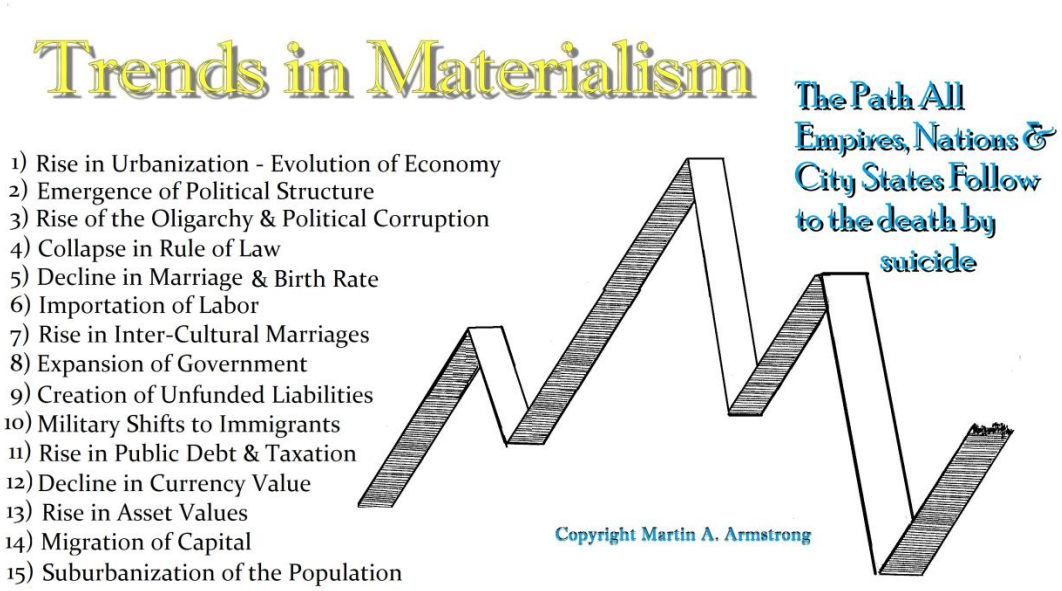
> *"If humanity wishes to save itself from biospheric destruction, it must return to living in natural time."*

They claim this means we have to go back to a moon calendar using 28 days even though it is out of sync with the solar calendar and the seasons. So it is hard to see how this is more natural using the moon rather than the sun. It is difficult to see where using a calendar based on the moon would suddenly make the world better than the current calendar based on the solar year. Looking back into history, many civilizations used the moon rather than the sun and they still fought war and famine. Nothing was substantially different within society. Just where do these bizarre ideas come from? What causes some people to just wish such devastation on the world and imagine societies that have never existed?

Doom-and-gloom has been going on for thousands of years. The year 1000AD was another period where the end of the world was to appear and the Second Coming of Christ was supposed to take place. It was so intense that King Aethelred II (*"The Unready"*) (978-1016AD) of England removed his portrait from his coinage and replacing it with the Christian symbol of the lamb. When the year 1000AD came and went and there was no end to the world, Aethelred II promptly put his portrait back on the coinage.

These Mayan extremists have been no different. They appear to seek the wrath of God upon the world for their own shortcomings and failures. They claim that Votan foretold we would experience an accelerated technological trend in society and of the damage of our collective divergence from natural law in exchange for material values. This line of bizarre interpretation is communistic nonsense. It has been clearly wrapped in a Mayan sheathe rather than Marx to try to sell an old idea that everyone should till the soil for the state. What they omit is that these ideas created China and Russia and oppressed so many people while killing untold millions. Enough already! Been there done that!

These Mayan extremists are merely preaching the same idealism that was behind communism with this whole distortion of what the Maya were all about solely to achieve their perfect world where there is no “materialism”. Their obsession with others possessing wealth is coveting their neighbor’s property for they simply cannot sleep at night tormented by the thought that someone else is having a good time they cannot afford. To accomplish their goals, we must eliminate all liberty to ensure you obey their ideals. They insist that according to the Mayans they actually believed that society would be this materialistic way as part of a natural cycle and we would accept this because there is a cycle of forgetfulness. This is just complete gibberish and propaganda. The Maya were not communists. Look well to history and the blood spilled because of this nonsense. Yet they will grab any theory and twist it to restate the same goals.



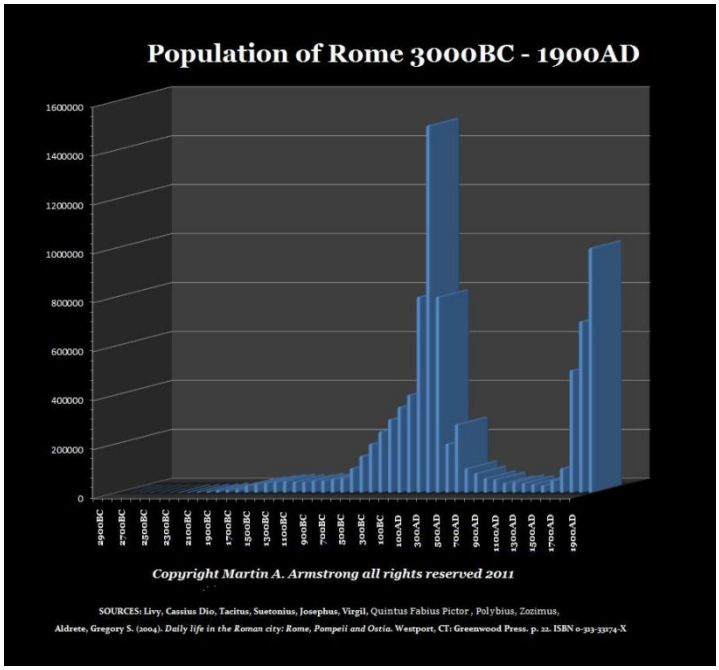
These same extremists recognize that this is a cycle and therefore they insist that the last time humanity found itself in a position where its society as a whole was largely materialistic and ego centered, void of spirituality and knowledge of the meaning of life, everything collapse and we returned to handing out flowers and tilling the soil. What they are totally ignorant of is that the signs they rant about as the ***Age of Materialism*** so we will return to nature and bliss, is also part of the evolutionary process of our collective behavior. Every society that you investigate shows the same primary 15 trends that signal its demise. Still, there is a progressive building of inherent volatility so that successive waves build in intensity and ultimately culminate in a catastrophic collapse as was the case with Rome that finally led to the abandonment of the cities. There is always an oligarchy that seems to appear making people think this is purely materialism ignoring that there is a desire to control as well for this can be internal bureaucrats as well as rich families or groups. As the rule of law collapses, corruption rises, and oligarchies become excessive no longer trying to pretend to be hiding behind the curtain, then this combination begins the trend toward rising taxes and diminished public service.

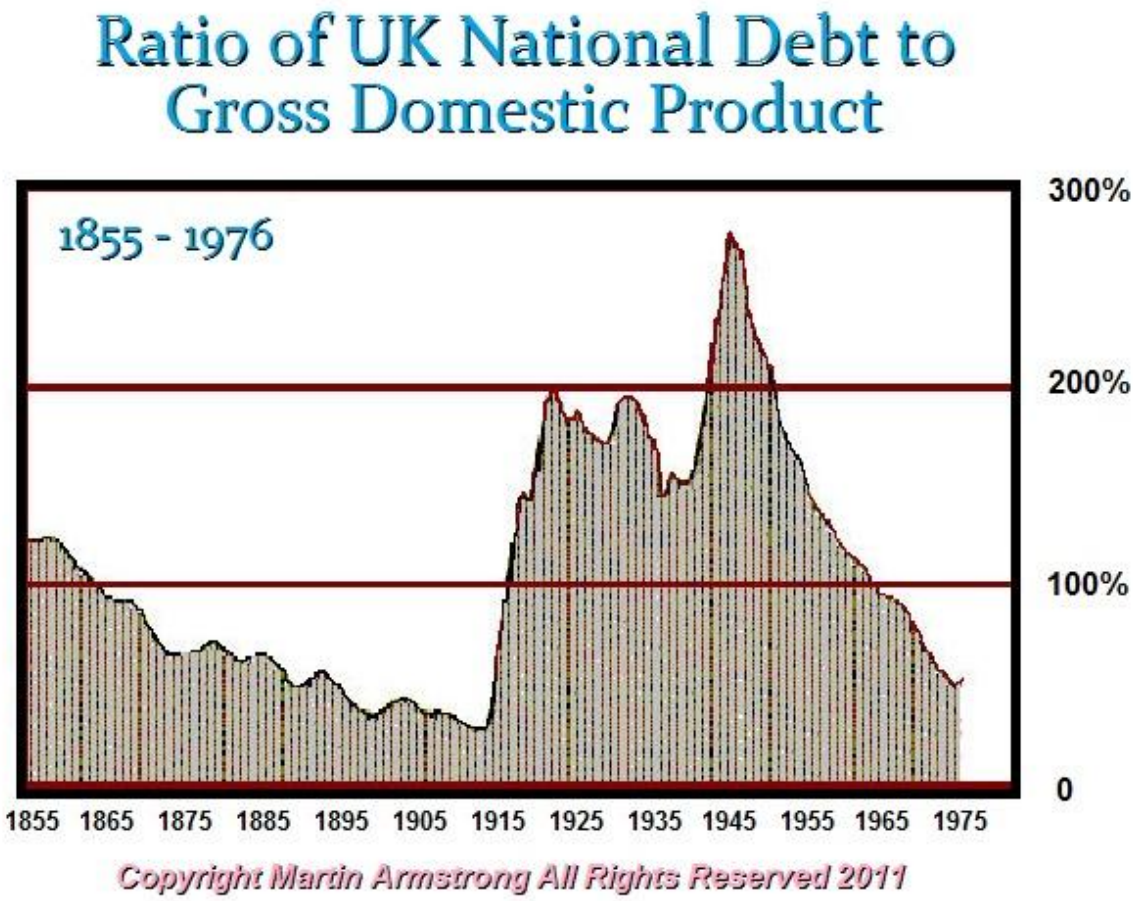
The rich begin to flee moving back toward a ***Villa Economy*** of self-sufficiency abandoning the cities. This is a reconstruction of Pliny the Younger's Villa Estate illustrating the elaborate infrastructure that created the self-sufficiency from an economic perspective.

Reconstruction of the Villa Estate of
Gaius Caecilius Cilo (61 – ca. 112 AD)
better known as Pliny the Younger

The ***Très Riches Heures du Duc de Berry***, or ***Très Riches Heures***, is possibly the best example of a French Gothic manuscript illumination that has survived today. This was a book of prayers to be said at canonical hours created for John, Duke of Berry (1340–1416), by the Limbourg brothers between 1412 and 1416. The book was completed by an intermediate painter and later Jean Colombe (1430-ca. 1493) between 1485 and 1489. The codex consists of 206 vellum leaves that are 30 cm in height by 21.5 cm in width. Here we have illustrations of the Villa Economy that emerged during the Dark Ages. It was the flight from the corruption and taxes that engulfed the cities that led to the flight to the suburbs. The Romans called this "***suburbium***" from which we derive the word suburbs. This massive abandonment of the cities caused by fiscal mismanagement by the state, rising taxation, collapse in the rule of law, and immense corruption led to the Dark Ages that began with the flight from civilization. Only because people needed protection, serfdom emerged as money no longer became important. The landlord provided the security in return for labor making available free housing and the safety of his castle walls.

Rome itself reached a population of 1 million around 180AD and began its decline. It eventually collapsed to the status of a near village and it took until the Victorian Age for London to boast of a population of 1 million by the 19th century. We see the same trend emerging as taxes rise, people abandoned the nations migrating just as the French announcement of raising taxes to 75% on the rich is creating a massive migration from France headed to Belgium, Spain, and Switzerland.





Britain peaked by 1914 and began its fall yielding the power to the new rising star – the United States. When we look at the debt of Great Britain we can see it explode with World War I from which it has never really recovered its former glory. The rise in taxation in Britain began with the Black Death of the 14th century as wages began to appear. The need for money led Edward I to default on his loans from the Jews and his confiscation of their property and ordered exile from Britain. This led to the steady decline in the Rule of Law. In Shakespeare's Henry VI he writes of the tax revolt of Jack Cade. It is in Part II that we find the famous dialogue from this tax revolt about "lawyers" but we must put this in the proper context that the only person who had lawyers was the King for the most part. Hence, the "lawyers" are in today's terminology the state's prosecutors who exploit the people to extract their wealth based upon the demands of the states. Shakespeare wrote of the Tax Revolt of 1450 led by Jack Cade:

> ***DICK:*** *The first thing we do, let's kill all the lawyers.*
> ***CADE:*** *Nay, that I mean to do. Is not this a lamentable thing, that of the skin of an innocent lamb should be made parchment? that parchment, being scribbled o'er, should undo a man?* ***Henry VI, Part II, SCENE II. Blackheath.***

While the Tax Revolt of 1450 has been memorialized by Shakespeare, the first Tax Revolt took place in 1381 led by Wat Tyler (1341-1381). The Chronicler Jean Froissart (1333-1400/1401) provides an account of the events in London most likely based on an eyewitness account from the King's Court, who the historian Edmund B. Fryde (1923-1999) believed was Sir William II Montague (1328–1397), Earl of Salisbury. The king created a new type of tax which was per person rather than the value of property. This became the first ***Poll Tax*** of 1377, which produced 22,000 pounds. The assessment was 4d per person with the only exception being children under the age of fourteen. The Parliament granted a second ***Poll Tax*** in 1379. This second tax was supposed to be fairer imposing 4d jointly upon the poorest married couples in a sort of graduated type of tax. However, it produced only 19,000 pounds. In December 1380, Parliament returned to the first model and now tripled the ***Poll Tax*** raising it from 4d to 12d per person and the age limit exempting taxation was raised from fourteen to fifteen. The tax rebellion was now rising. Some 458,356 taxpayers evaded the tax. In London itself, 102,500 taxpayers were now "missing" from the tax collection.

On or about June 6th or 7th in 1381 at Kent, a large group of rebels and laid siege to Rochester Castle to free a citizen imprisoned a few days earlier for being a disobedient serf. The king's men did not know what to do and the shock of the rebellion led them to turn the castle over to the people. The Constable John Newton was taken hostage. This success became inspiring and by June 7th, the rebellion now spread to another neighbor in Maidstone.

Tax Rebellion of Wat Tyler (1341 - June 15th, 1381)

It was at this moment in time when an effective leader emerged - Wat Tyler (1341- 6/15/1381). It was Tyler whose leadership proved to be the chief reason behind the success that followed. Much of the rebellion had also been due to the fact that the French were routinely raiding and

plundering the coast. Their taxes did not pay for the protection of the people. Thus, one factor that perhaps contributed to the failure of the rebellion was that Tyler had all those who lived near the coast within 12 leagues (36 miles) should defend the coast against any French attack. Thus, Tyler had divided his force and deprived himself of its true strength.

Wat Tyler led his force eastward and captured Canterbury on June 10th. The government was in a state of shock. This was the people rising up against royal power, something that had never been done before in England. The rebels had produced a list of people they called ***"traitors"*** to the country. They entered Canterbury cathedral and told the monks they had better select a new archbishop for this one, the Archbishop Sudbury, would soon be executed. Indeed, he was executed 4 days later. They also seized the sheriff of Kent, William Septvans, and stripped him of all his judicial records regarding taxes and set them on fire.

On the same day, a parallel attack took place in Essex where they seized the sheriff, who did manage to escape, but they executed his assistants. It was at this time that Wat Tyler freed John Ball (1338- 7/15/1381) who was being imprisoned at Maidstone for preaching against the class structure of society. He had been a priest at York and at Colchester. He was excommunicated about 1366 for his moving sermons against what was an oligarchy controlling the bureaucracy behind the curtain. Ball now joined the rebels on their way to London. Ball incited the people with a popular line, ***"When Adam dalf [dug] and Eve span [spun], Who was then a gentleman?"*** According to the ***Anonimalle Chronicle*** of the times, they reported that Ball advocated the slaughter of lords and prelates. There was most certainly a touch of Marxism in his classless arguments for reform. Most of the accounts of John Ball by the chroniclers, including Jean Froissart, tend to be very biased. Nevertheless, this was a communistic idea (anti-rich) that began to surface. No doubt, John Ball's sermons to the rebels inspired their feeling of righteousness. However, John Ball in no way orchestrated events. Certainly, the presence of Ball led many to attribute his ideas as inspiring the entire affair. There is no such evidence of that proposition. They sought to tie the rebels through Ball to John Wycliffe (c. 1330-1384) who was the first to translate the Bible into English, but also had a communistic type of view arguing the church should give up its worldly possessions. He began to preach strongly in 1378 against wealth (materialism) inspired by the **Black Death**.

Within just two days, Tyler organized his army and marched to London covering 70 miles reaching there on June 12th. The rebels in Essex had also marched and now reached London camped on the north side of the Thames. According to the account of the Chronicler Froissart, the men were without supplies. They needed swift action to gain success. King Richard II was just 14 years old. Tyler sent the imprisoned Constable Sir John Newton of Rochester to establish contact with the King and to let him know they wanted a meeting with him. According to Froissart, the rebels had captured the king's mother returning from a pilgrimage as she entered

Canterbury. Tyler did not harm her, and allowed her to continue her journey to London. Tyler is said to have sent a message to the King that the rebels had risen "***in order to save him and to destroy the traitors to himself and his kingdom***" **–** in other words, the bureaucrats. The 1381 rebels marched behind royal standards and saw themselves as rebelling not against the king, but the bureaucracy. Indeed, the leader to emerge after the murder of Wat Tyler in 1381 at Norfolk was Geoffrey Lister, who held lawcourts at which opponents of popular rights were punished all within the traditional legal framework of established civilization.

According to the account in the ***Anonimalle Chronicle***, on the morning of June 12th, 1381, The King indeed went to meet the rebels. The rebels demanded the execution of John Gaunt and 15 other traitors. The King refused to comply but agreed to meet them at Windsor on Monday, June 17th to complete the negotiations. The rebels now stormed London and blockaded the king himself in the Tower. How the rebels invaded London is still a mystery today. But this was a popular uprising and no doubt there was tremendous support among the people as a whole. The rebels were able to obtain food. They attacked the prison and freed everyone destroying the place in their wake. They also destroyed the Marshalsea Courthouse. They were intent upon executing John Gaunt, who was very unpopular with the people everywhere. The Londoners were now supporting the rebels and the government now trembled. The rebels took the Savoy Palace and destroyed it due to a cache of gunpowder stored there made the explosion horrific. Wat Tyler's men crossed London Bridge from Southwark while the Essex army entered through Aldgate on the morning of June 13th. The rebels targeted any place storing tax records destroying everything they could reach.

John of Gaunt
1st Duke of Lancaster
(1340 – 1399)

On June 13th, the rebels met with the king in the Tower of London. The King insisted he would meet the rebels outside the city at Mile End on the morning of June 14th. The King is said to have granted charter pardons and freedom from all serfdom to the men of Essex and Hertfordshire. The dishonesty of the King would show after the rebellion collapsed for he revoked these decrees on July 2nd. Yet he convinced a large portion of the rebels they had won and to depart. The King also agreed they could seize all those bureaucrats they considered to be traitors, but they were to be given trials. In London, they had entered the Tower and killed Archbishop Sudbury and hales. Chaucer tells us they killed about 150 foreigners, Flemish textile workers as well.

The King now cleverly reduced the rebel forces by pretending to grant their requests. The Mayor of London, Walworth, was harboring troops. Now that the forces of the rebels were leaving under false pretenses, those that remained with Wat Tyler were told that the King wanted to meet with them in the north-west corner of the City at Smithfield that was largely an open field. The rebel forces met there with Tyler on June 15th, 1381. This is where the ***Anonimalle Chronicle*** shows its bias for it claims that Wat Tyler now demands that "all Lordships should be given to the parishioners and that there were to be no bishops except one." They then claim that Tyler threatened one of the King's followers with a dagger. The Mayor then had Tyler run threw on the spot.

The King cried out to the rebels that he would be their leader. Several of the rebels now carried Tyler to Saint Bartholomew's Hospital. The King led the rebels largely by himself and Walworth gathered the troops and then went and surrounded the rebels. They pled for mercy and the King supposedly let them leave under escort back to Kent.

When the rebels had dispersed, William Walworth had Tyler dragged from the Hospital and beheaded. John Ball was then taken prisoner at Coventry, given a trial in which, unlike most, he was permitted to speak, and hanged, drawn and quartered in the presence of King Richard II on 15th of July 1381. Ball's head was then subsequently stuck on a pike on London Bridge typically to show the king's victory and vengeance. News of these events led to still some discontent for there was an uprising in Norfolk on June 16th. There were many other towns and villages where discontent continued. Anyone connected with John Gaunt was a target. Judges and justices along with tax collectors were murdered. Some of the Essex rebels were confronted and slaughtered on June 28th. Many rebels were seized and executed - nearly 200 in all.

Destruction of the tax records (Manorial Records) was widespread. The King had even ordered the arrest of all his tenants at Kensington. Most of the writings of this period are biased; including the monastic chroniclers for this was also a uprising against bishops that tended to be subordinate to the state anyway. The rebels had executed many monks for their bias and injustice. It was this deep-seated connection between the many abbey administrations that interweaved religion and oppression by the state. The rebellion that emerged in Norfolk on June 16th, the day after the murder of Wat Tyler, was led by Geoffrey Lister. The rebels were slaughtered 10 days later. Richard II proved himself to be a ruthless and cunning king even at the age of 14.

Tax Revolt of 119AD
Roman Emperor Hadrian

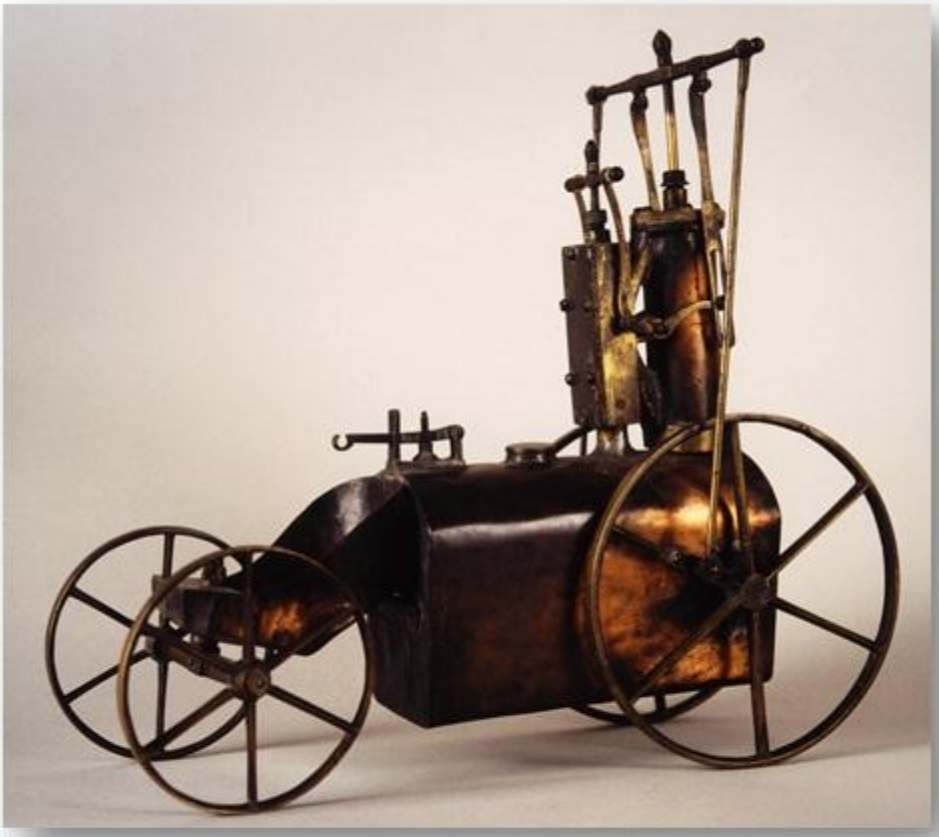
Roman Sestertius issued to announce the burning of all tax records in the Trajan Forum wiping out nearly 900 million sestertii owed in back taxes - early amnety!

Another uprising was stirring in 1393 in Cheshire. There were 5 uprisings between 1381 and 1405. To this day, taxes are raised without the consent of the people and anyone who challenges this arbitrary power is imprisoned typically on other pretended issues. Even the Emperor Hadrian (117-138AD) issued a coin showing him burning the tax records when a tax rebellion was in the wind.

Tax rebellions have been a dominant factor throughout history. Taxation has featured as a leading cause behind the rebellions in England during the insurrections of 1381, 1450, 1469, 1489, 1497, 1525, 1536 and 1549. The slogan of the American Revolution was ***"no taxation without representation."*** Even the English Civil War that led to the beheading of Charles I (1625-1649) in 1649 was prompted by the fact that the king did not have the power to tax the people without their consent. He was forced to convene a parliament and that began the uprising led by Oliver Cromwell. While the religious right, the Puritans usurped the opportunity, it was the taxes that provided the underlying discontent. Nevertheless, the king was replaced by a republic and those ministers became just as corrupt as the oligarchy of Rome. We find Charles Dickens writing about the corruption in 1859 in his work Bleak House.

Charles I
(b: 1600; 1625-30 January 1649)

> *"This is the Court of Chancery, which has its decaying houses and its blighted lands in every shire, which has its worn-out lunatic in every madhouse and its dead in every churchyard, which has its ruined suitor with his slipshod heels and threadbare dress borrowing and begging through the round of every man's acquaintance, which gives to monied might the means abundantly of wearying out the right, which so exhausts finances, patience, courage, hope, so overthrows the brain and breaks the heart, that there is not an honourable man among its practitioners who would not give—who does not often give—the warning, "Suffer any wrong that can be done you rather than come here!"*
>
> ***Id./Bleak House; In Chancery, Chapter I***



William Murdoch (1754-1839) Steam Carriage
Stirling Smith Museum, Dumbarton Road, Stirling FK8 2RQ, Scotland

How did the oligarchy destroy Britain? The Industrial Revolution began in Great Britain but the oligarchy killed the trend. Nicolas-Joseph Cugnot (1725-1804) demonstrated his ***fardier à vapeur*** ("steam dray"), an experimental steam-driven artillery tractor, in 1770 but it proved to be impractical. New innovation shifted to Britain where the Industrial Revolution began. However, by 1784, William Murdoch (1754-1839) had built a working model of a steam carriage, which was probably the first steam locomotive but without tracks. It may have been English regulation that inspired tracks. Murdoch was also the inventor of gas lighting. In 1801 Richard Trevithick (1771–1833) built a full-sized functioning road locomotive known as the "***Puffing Devil***". These early vehicles came at the dawn of the Industrial Revolution.

Naturally, these early attempts began to show potential for mass transit, until a backlash unfolded with the enactment of the ***Locomotive Act (1865)***, which required self-propelled vehicles on public roads in the United Kingdom to be preceded by a man on foot waving a red flag and blowing a horn. Clearly, these early attempts that would have put England on the map were effectively killed by legislation orchestrated by the status quo of the English Oligarchy. Britain would not regain that status as the Industrial Revolution shifted to America and

continental Europe. Inventors and engineers abandoned the idea of creating automobiles and turned to improving railway locomotives instead. The British oligarchy stopped the innovation square in its tracks. They did remove the need for the red flag in 1878 and finally went on to abolish the law entirely only in 1896 due to the fact that automobiles were becoming far more common in America and Germany leaving Britain behind in the stone age. Similarly, President George Bush, Jr. banned stem cell experimentation that led to such developments leaving the United States. In this case, the religious right has stopped the innovation. It is always the oligarchy that influences government to support their status quo.

Charles Hibbert, the noted English historian, wrote on this subject of English Common Law torture and how the various monachs used to extract confessions to justify their actions:

> *"The use of torture, although still not recognized by Common Law, was now often used in criminal trials of this sort after a warrant had been obtained from the Council and may well have been used without a warrant. Its use was not unknown before the Tudor period. Prisoners could legally be tortured by licence of the King at least as early as the reign of Henry II. The rack was in the Tower by the time of Henry VI and by the following century the Scavenger's Daughter-a device which crushed the body until the blood spurted out of the nostrils and the tips of the fingers instead of stretching it 'until the bones and joints were almost plucked asunder'-was also in common and authorized use."*
>
> ***(Roots of Evil, 1963, p24)***

The political corruption within England, which had even stopped the Industrial Revolution shifting it to America and Continental Europe, also extended to the prosecution of law. It became prevalent in government where the pretense of law was used solely for revenue raising. Anyone found guilty of the most minor crime such as taking an apple was sold by the state as an indentured servant. This was the source of labor for America's pre-revolution. After the American Revolution they were sent to Australia. Of course once sold, no one paid for their return to England. Hibbert reported the sentence read in court:

> *"Because you have committed this offence, the sentence of the court is that you shall no longer be burdened with the support of your wife and family. You shall be immediately removed from a very bad climate and a country overburdened with people to one of the finest regions of the earth where demand for human labour is every hour increasing and where it is highly probable you may ultimately regain your character and improve your future."* ***(Roots of Evil, p145)***

John Stuart Mill
(1806-1873)

It was against this backdrop of the abuse of the rule of law for the purpose of monetary gain that we must understand the atmosphere behind John Stuart Mill (1806-1873) when he wrote in his 1859 celebrated work "***On Liberty***" about the Rule of Law and corruption: ***"let us not flatter ourselves that we are yet free from the stain of legal persecution."*** p34. Government cannot profit from law for once it possess such a power, its abuse is inevitable. A dissident is not a profession one aspires to – it is forced upon them by the circumstances of legal persecution. Hence, a political prisoner is someone who stands tall against the corruption of the state typically administered by the monetary gain of the state of the oligarchy pulling its strings. This has been the curse under which mankind has been forced to live and it is the source of the Decline & Fall of all nations.

King John (1166–1216) Magna Carta Signed 1215 at Runnymede on demand of Rebel Leaders

Historically, the king used law to gather revenue and this was the very essence that was behind the forcing of King John at Runnymede to sign ***Magna Carta*** – the first bill of rights. It was Magna Carta that installed the right to trial by jury because it was said that there had hardly

been an Englishman who had not been fined (*amerced*) once or twice a year for something. Eventually, the king, stripped of his arbitrary power to fine you, created the concept of the King's Peace and claimed injury by any dispute between two citizens. This reversed the ancient traditions of law where the only state crime was against some god or directly against the state. Even murder was a private dispute that was to be prosecuted by the injured family. The king was to be the impartial arbitrator as was the case of King Solomon with the two women arguing over a child. Post-***Magna Carta***, the English king now claimed injury in every private dispute. He demanded compensation (fine) that became his chief revenue source. This is why we have billions of laws today for everything from parking and speeding to murder and terrorism. Felonies were punishable by death and that meant the king confiscated all your property and threw your family out on the street. This was the stain of "***legal persecution***" where the motive is really money.

Once the state benefits monetarily from the rule of law, justice simply vanishes. The abuse of the criminal law led Mill to establish the principle that someone's liberty should never be held ***"accountable to society for his actions, insofar as these concern the interests of no person but himself."*** p104. Mill concluded that the ***"most cogent reason for restricting the interference of government, is the great evil of adding unnecessarily to its power."*** p121-122. These are observation from someone who saw firsthand the collapse in the rule of law,

It is always the collapse in the rule of law that eventually leads to the collapse of society. Once the state stacks the courts with pro-government judges, the end is guaranteed for this destroys the very purpose of coming together to form civilization. People gather together forming urbanization (civilization) for safety and the rule of law which becomes the very reason society self-destructs once an oligarchy seizes control through bribery of the political mechanisms of the state. Consequently, people fled the cities when Rome was awash with corruption moving toward the ***Villa Economy*** model, but then reform collectives as local landlords offering their castle for protection in return for their labor as the rule of law once again is reborn.

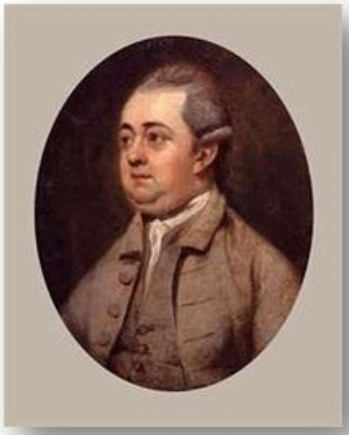
This claim that we are in some unique ***Age of Materialism*** and that 3508BC to 3114BC somehow is magically different is just absurd. The pulse of civilization is the gravitation between two extremes and at the core is the rule of law. Not only are personal human rights dependent upon the rule of law, but so is property. One cannot even own a house without the right to property and a rule of law that is definitive. The collapse in the rule of law in the United States that we saw with M.F. Global where the law was supposed to be the customer assets are segregated from the liabilities of the firm proved unenforceable when Judge Martin

Judge Martin Glenn

Glenn protected the NY Banking oligarchy at the expense of investors. With no right to property on deposit in a New York firm, how can capital invest? Without the rule of law, everything collapses. Judges always become the pawns of oligarchies.

Edward Gibbon (1737-1794) in his ***Decline and Fall of the Roman Empire*** noted well the corruption and collapse of justice and the rule of law that sent Rome to its grave. He wrote:

"…unable to protect their subjects against the public enemy, unwilling to trust them with arms for their own defence; the intolerable weight of taxes, rendered still more oppressive by the intricate or arbitrary modes of collection; the obscurity of numerous and contradictory laws; the tedious and expensive forms of judicial proceedings; the partial administration of justice; and the universal corruption, which increased the influence of the rich, and aggravated the misfortunes of the poor. A sentiment of patriotic sympathy was at length revived in the breast of the fortunate exile; and he lamented, with a flood of tears, the guilt or weakness of those magistrates who had perverted the wisest and most salutary institutions." **Book III, Chapter 34**



Edward Gibbon (1737-1794)

Indeed, Gibbon observed that ***"unless public liberty is protected by intrepid and vigilant guardians, the authority of so formidable a magistrate will soon degenerate into despotism."*** This is the said state of society and the driving force behind the business and political cycles within civilization. Gibbon wrote concerning Emperor Commodus (180-192AD) with whom the Decline and Fall of Rome begins, that he employed every tyranny possible regarding taxes in desperate pursuit of revenue. He made each …

Commodus (180-192AD)
(Pictured as Hercules)

"distinction of every kind soon became criminal. The possession of wealth stimulated the diligence of the informers; rigid virtue implied a tacit censure of the irregularities of Commodus; important services implied a dangerous superiority of merit; and the friendship of the father always insured the aversion of the son. Suspicion was equivalent to proof; trial to condemnation. The execution of a considerable senator was attended with the death of all who might lament or revenge his fate; and when Commodus had once tasted human blood, he became incapable of pity or remorse"

(Book 1, Chapter 4).

US sends troops Against World War I Veterans & their Families

The Bonus Army in Washington, D.C., 1932 killing even children from Gas Attack

It has always been the state that can wield tanks, arms, and legal persecution of citizens who dare to stand up and demand liberty or justice. The rich never possess that power to harm society until they cross the line and assume control of the state through the corruption of politicians and the rise of the oligarchy. One has to question those that constantly demand going after the rich when in fact such schemes hand power to the state and typically the oligarchy is never touched anyway.

In 1924, a grateful Congress voted to give a bonus to World War I veterans - $1.25 for each day served overseas, $1.00 for each day served in the States. As usual, politicians want the glory but not the reality. This was an unfunded liability and the payment would not be made until 1945. In May of 1932, some 15,000 veterans, most unemployed and destitute, descended on Washington, D.C. many with their families to demand immediate payment of their bonus in the middle of the Great Depression. They proclaimed themselves the ***Bonus Expeditionary Force*** but the public dubbed them the ***"Bonus Army".*** Raising ramshackle camps at various places around the city, they waited. To the surprise of the nation, the veterans from World War I received no respect from Congress. In fact, the United States government sent in troops to crush the demonstration of veterans no different than the kings of England dealt with tax revolts. They even gas the men with their families resulting in the death of many children.

While the discipline in the camp was good, the government called them criminals and even communists for seeking money that had been promised them. They set up streets in the camp that held about 10,000, dug latrines, and they held military formations daily. Newcomers were required to register and prove they were really veterans with honorable discharges.

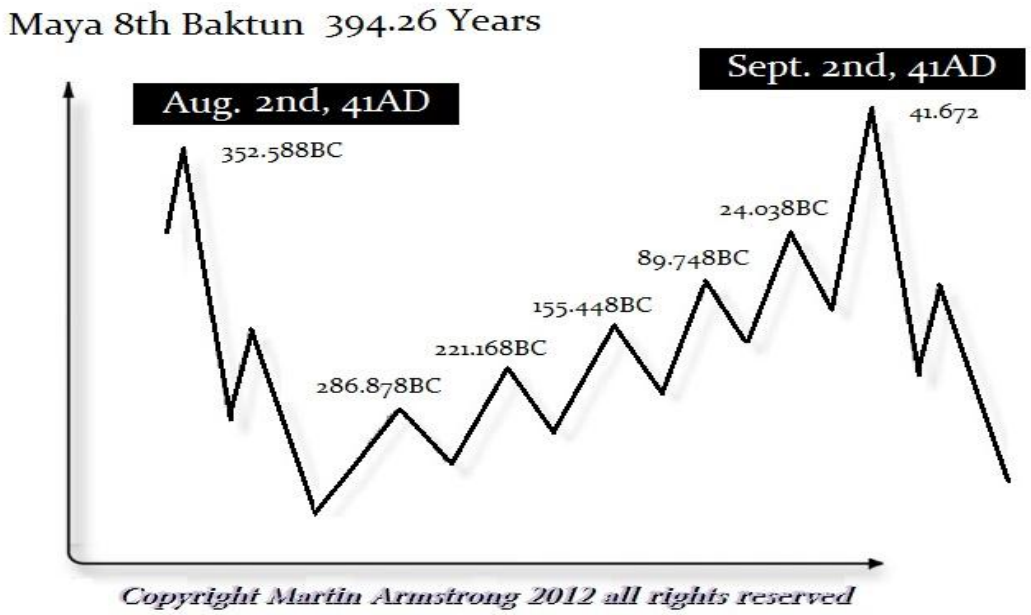
June 17, 1932 the Senate was voting on the bill already passed by the House to immediately give the vets their bonus money. By dusk, 10,000 marchers crowded the Capitol grounds expectantly awaiting the outcome. The Senate had defeated the bill by a vote of 62 to 18. A month later, on July 28, Attorney General Mitchell head of the “Justice Department” ordered the forceful evacuation of the veterans from all government property. Mitchell sent in the

Washington police who immediate fired shots and two marchers were immediately killed. Learning of the shooting at lunch, President Hoover ordered the army to clear out the veterans. On July 28, 1932, the US cavalry supported by six tanks were dispatched with Chief of Staff General Douglas MacArthur in command. Major Dwight D. Eisenhower served as his liaison with Washington police and Major George Patton led the cavalry.

By 4:45 P.M. the troops were massed on Pennsylvania Ave. below the Capitol. Thousands of Civil Service employees spilled out of work and lined the streets to watch. The veterans, assuming the military display was in their honor, cheered. Suddenly Patton's troopers turned and charged. "Shame, Shame" the spectators cried. Soldiers with fixed bayonets followed, hurling tear gas into the crowd. They sent soldier to kill veterans rather than pay them $1 a day.

By nightfall the Bonus Army was forced to retreat across the Anacostia River being unarmed and with women and children. Hoover ordered MacArthur to stop when it became clear this is the most un-American display of liberty anyone could possibly imagine. However, ignoring the command, the General MacArthur led his infantry to the main camp and life was not considered worth much that day. By early morning the 10,000 inhabitants were routed and the camp was in flames. Two babies died that day and nearby hospitals were overwhelmed with casualties. Eisenhower later wrote, ***"the whole scene was pitiful. The veterans were ragged, ill-fed, and felt themselves badly abused. To suddenly see the whole encampment going up in flames just added to the pity."***

This action contributed much to the loss of Hoover a few months later at the polls. Roosevelt won not on his claims of socialism and a New Deal. The night of the elections he denied on radio rumors that he would devalue the dollar and confiscate gold. During the Presidential Election of 1932 Roosevelt blamed the entire Depression on wholly domestic events. He blamed Hoover for overbuilding the productive industry within the nation that led to an orgy of speculation. Roosevelt also contended that Hoover was responsible for the massive losses on foreign loans, the ***Sovereign Debt Crisis***. Amazingly, Roosevelt contended Hoover forced other nations off the ***Gold Standard***. These claims were of course political of which none were true – but they were targeted to simply win the election.



No matter what period of time we look at, there is always political corruption that becomes excessive at the top of the cycle instigated by an oligarchy that typically controls the bureaucracy or today the executive branch in the United States in addition to the Judiciary. Taking a Baktun of 394.26 years and using the volatility structure of the Economic Confidence Model that builds in six waves, we see the last three waves here of 89BC, 24BC and 41AD were all important turning points. There was the Social War 90-89 BC that was a rebellion waged by the other Italian cities that were being denied the rights of citizenship of Rome while part of the rising Empire, yet taxed and denied representation in Rome. In 91 BC, Marcus Livius Drusus was the tribune and he proposed legislation granting Roman citizenship to the Italians. He was then assassinated by the oligarchy for daring to propose such legislation and that sparked led to the Social War that forced Rome to extend citizenship to all of Italy.

The next wave peaked in 24BC. This cycle is what created Europe. Julius Caesar crossed the Rubicon to confront the oligarchy that corrupted everything about Rome. They even corrupted the calendar inserting days to postpone elections. In fact, the corruption was so widespread, that interest rates doubled from 4% to 8% for the elections of 54 BC because there was so much bribery going on to gain votes. Caesar was a member of the ***Popularis*** party for the people that stood against the Oligarchy led by Cato. In the end, they assassinated Caesar because of his economic reforms. Brutus even bragged about the deed on his coinage boasting he killed Caesar on the Ides of March, 44BC.

Brutus, 42 BC Silver Denarius
"EIDMAR" Declaring He Killed Caesar
on the Ides of March

Marc Antony - Cleopatra VII
Silver Denarius

Octavian and Marc Antony then hunted down the assassins of Caesar. Brutus was killed in 42BC. But civil war broke out a third time when Marc Antony became romantically involved with Cleopatra VII who had given birth to Caesar's son - Caesarian. Octavian defeated Antony and Cleopatra in 30BC. In 28 BC, Octavian turned to the Senate with an eye toward reforming this institution as well. Armed with the title of ***Princeps Senatus*** and with the help of Marcus Agrippa, Octavian conducted a census of the population. This maneuver allowed him to reduce the number of senators to 800. Still an unwieldy number to say the least, yet still a major improvement over the inherent political corruption that was still present. On January 13th, 27 BC, the Senate of Rome received back its powers to control the state. In return, Octavian was granted for 10 years control of Spain, Gaul and Syria, centers of frontier defense, and the appointment of governors. These were thus imperial provinces, and the Senate controlled the remaining portion of the Empire including Italy. This system was seemingly Republican, with the added safeguard that no governor of any province would dare to go against Octavian' wishes.

Octavian's reforms therefore recognized that by maintaining the Republican institutions in combination with a strong head of state entrusted with the defense of the Empire. He could ultimately ensure the prosperity of all Roman traditions while allowing Rome to achieve its destined greatness. Indeed, the basic design of such a system still serves as the foundation of our modern forms of government today we call democracy, but are really republics.

As Octavian consolidated his power, he shed his role as de facto dictator and eventually transferred to the State, "the free disposal of the Senate and the people." Four days after this rehabilitation of the Senate, Octavian received a new title, ***Augustus*** (loosely meaning revered or worthy of veneration) on January 16th, 27 BC. Octavian therefore became known as Augustus Caesar Octavian. From this period onward, his coinage simply bears the name Augustus. For generations to come, history would always remember Octavian

by his new name Augustus. And as for Rome itself, it would be the assumption of this title by all of his successors that provided the means through which Imperial status was transferred from one Emperor to the next. For this reason, the granting of the title Augustus to Octavian in 27 BC marked the birth of the new Imperial age of Rome.

In 25 BC, Augustus married his only child, Julia to his nephew Marcellus. Augustus was clearly grooming Marcellus to be his heir and hoped that this union would produce many grandchildren. Unfortunately, Marcellus died in 23 BC quite suddenly and Augustus' dreams seemed to vanish. Matters were made worse by Augustus himself becoming severely ill. Augustus, along with many others, believed that he was near death.

In 23 BC, when Augustus was in ill health, he sensed that conspiracies were in the making. Augustus terminated his Consulship in favor of the title ***"Imperium Maius"*** and ***"Tribunicia Potestas"***, commonly known as the ***Tribunican Power***, which gave him control over the provinces, the Senate and the state. Augustus later regained his health (although he continued to suffer from epilepsy) with the aid of his private physician, Antonius Musa.

Augustus emerged from this near-death experience with a new quest - to revive Roman religion. He created great temples to Mars and Apollo and ordered the temple of Capitoline Jupiter to be established. In 12 BC, he succeeded Marcus Lepidus as ***Pontifex Maximus***, the highest priesthood in Roman religion. The ***ARVAL BRETHREN*** were also revived, and the ranks of the Vestal Virgins were filled.

Augustus embarked on a path of major administrative changes in the spirit of his great uncle Julius Caesar. Reforms were made in finances as well as in the bureaucracy. A host of legal reforms were also introduced covering everything from Treason and bribery to social reforms. The Equestrian Order and Freedmen were brought into the process of government giving birth to the civil system, which endured for the next 500 years. The provincial reforms instituted by Augustus included a new tax system.

Augustus was also given the title of ***Pater Patriae***, which he used to institute moral and social reforms. Augustus began to stress the importance of the Roman family and above all the institution of marriage. In 18 BC, he introduced the ***lex Julia de adultenis,*** which punished adultery, and the ***lex Julia de maritandis ordinibus,*** which required bachelors to marry. He also required the remarriage of the widows, with the only exception being granted to Antonia his niece. Thus, the social and moral

Augustus (27BC-14AD)
Silver Denarius of Augustus Emphasing Family Julia and her two sons Gaius and Lucius

reforms introduced by Augustus not merely honored family life, but attempted to reverse the "free love" trend supported by Ovid who he banished to the Black Sea and his own daughter Julia to an island for her promiscuity. These were trends that had surfaced during the corrupt age of the Republic contributed to the corruption of morals in general including political ethics.

As the cycle now moved into the high for 41AD, once more we see corruption consume everything. It was Caligula who was perhaps crazy or drunk with power. Perhaps the most famous story about Caligula concerns his appointment of a racehorse as a Senator of Roman. The horse lived in luxury being pampered beyond belief. Dinners were held in his honor and he often dined with the emperor in the palace. He is said to have looted the tomb of Alexander the Great and wore his breastplate. Caligula was also said to have dissolved pearls in vinegar so he could drink wealth. Such extravaganzas, along with precious gem studded yachts, all combined to steadily drain the treasury by some 3 billion sesterii, an amount which had been left to him by Tiberius. As Caligula discovered the exhausted state of his treasury, his generosity turned into punitive taxation, extortion and confiscation of private assets. He is said to have instituted taxation on prostitutes and opened a brothel within the imperial palace in an attempt to raise funds.

Caligula
(37-41AD)

Relations with the Senate began to break down by 39AD. Wealthy senators were forced to buy gladiators at outrageous prices, which was merely an attempt to confiscate funds to cover his previous extravagances. Caligula then accused the Senate of complicity in the executions of Tiberius and those of his mother and brothers. Caligula then dismissed both consuls. A conspiracy seems to have emerged involving his two remaining sisters Agrippina Jr. (mother of the future emperor Nero) and Livilla along with Drusilla's husband, Marcus Aemilius Lepidus. The plot, being discovered, resulted in the banishment of his sisters to the tiny Pontian islands were their mother had died. Lepidus was executed.

Caligula viewed himself as a living god more in line with Asian culture building a temple to himself on the Palatine hill forcing wealth citizens to pay enormous sums to be his high priests.

By the year 40 AD, the oppression of the Senate had become too much. Another plot was discovered resulting in the execution of several senators. But support for Caligula was vanishing everywhere. Finally, a wider plot developed involving even the commander of the guard and the palace secretary as well as several senators. He was assassinated on January 24th, 41 AD. The conspirators quickly moved to the palace killing his wife and her daughter in hopes of ending the monarchy.

Claudius (41-54AD)

Gold Aureus Showing Praetorian Guard

The key factor proved to be the German imperial bodyguard was ready to plunge the city into a general massacre as they hunted down the assassins. The Senate tried to muster support to retake power, but failed to gain the support of the ***Praetorian Guard***. As the story goes, upon the discovery of Caligula's Uncle Claudius hiding behind the curtains in the palace, he was hailed emperor by the soldiers thus ending the Senate's move to restore the Republic. The hatred for Caligula ran deep. His name was erased from many public inscriptions, his statues pulled down and destroyed and his coinage recalled and melted whenever possible.

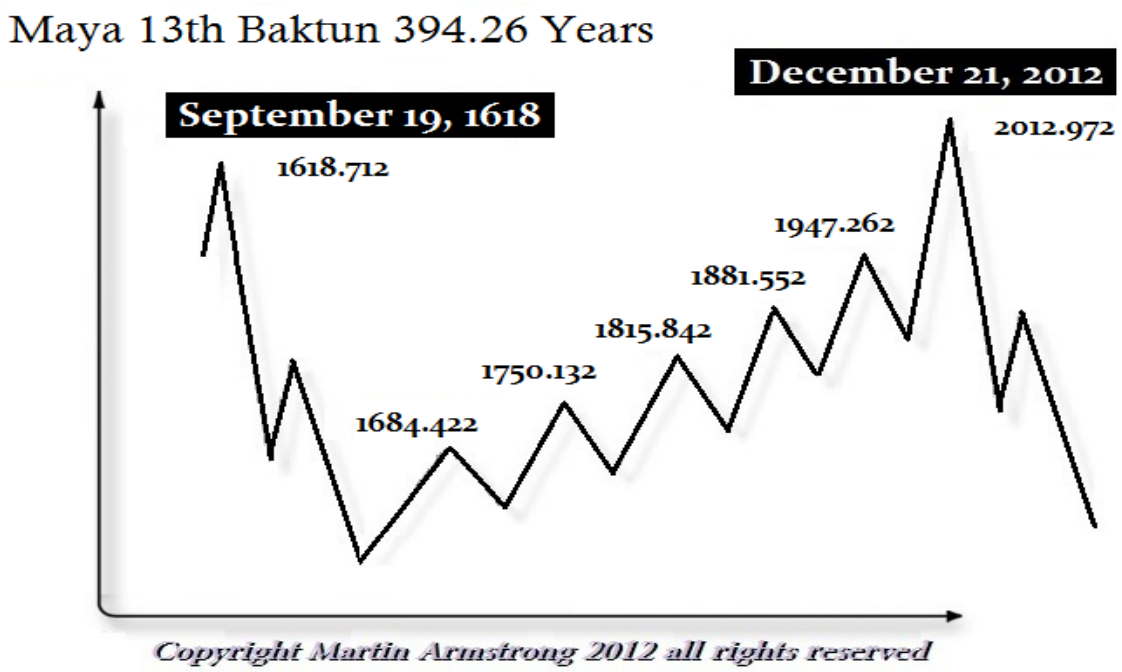
The Senate was left with little alternative. Claudius was immediately advised to stand firm and the troops were thus paid a donative of 15,000 sesterii per man insuring the succession of power. Claudius was 50 years old at the time. His first action as Emperor was to deal with the assassins of his nephew Caligula to establish precedent that the emperor should never be violated. Claudius sentenced all but one to death. He also abolished the treason trials that had been used again by Caligula in part to confiscate the wealth of his victims to refill the treasury. Once again we see the legal persecutions for the state’s monetary gain.

Claudius also burned all the criminal records and tax bills. He also destroyed Caligula's infamous collection of exotic poisons. He also returned much of Caligula's confiscations of property and

ended Caligula's practice of paying legacies to the Emperor. All these acts were an attempt to reassure the people and the Senate that he was not like Caligula.

Despite his best efforts, several attempts on Claudius' life were made. Over 35 senators and 300 knights were executed for suspicion of plots or attempts. Some of these were plots invented by his wife Messalina. But there was a major rebellion that broke out in 42 AD led by Lucius Arruntius Camillus Scribonianus who was the governor of Dalmatia. The rebellion collapsed within five days exposing several prominent senators.

The patterns never change. There is always the abuse of the rule of law that leads to corruption and the collapse of commerce. Consequently, the 13th Baktun is perhaps the culmination of not the ***Age of Materialism*** from the standpoint of just hunting down the rich, but the peak in political corruption that is caused by fiscal mismanagement. This is typical at the peak of the cycle in the economy before there is a major sweeping change. However, this does not indicate that we return to some mythical age of nature where we all hand out flowers to each other. It is a swing in the political fortunes of society.



When we turn to the current Baktun, this began with the rising trend that started in the early 17th century and culminated in a new political system. It was the American Revolution that provided such a profound change. It was ending monarchy (corruption) that had exploited the people. The oligarchy in Britain orchestrated that whatever was purchased from Britain had to

be paid in gold or silver, yet what Britain purchased from America was paid in copper. This extracted wealth from the American Colonies and contributed ultimately to the Revolution.

When John Adams (1735-1826) was a lawyer, he attended a trial of February, 1761, in Boston, where the practice of the king, desperate for money, had obtained in the colonies the issuing of writs of assistance for the revenue officers. These writs empowered the king's revenue agents at their discretion, to search suspected places for smuggled goods that taxes were not paid. The defending lawyer was James Otis (1725-1783) whose speech in court moved men toward revolution. He declared the writs were ***"the worst instrument of arbitrary power, the most destructive of English liberty, and the fundamental principles of law, that ever was found in an English law book;"*** since they placed ***"the liberty of every man in the hands of every petty officer."*** *(Cooley's Constitutional Limitations, 801-303 (5th ed. 368, 369))* This famous debate is the origin of the ***Fourth Amendment*** requiring the need for a search warrant demanding probable cause for entering someone's home rather than just arbitrarily searching to see if you could be charged with anything. The ***Patriot Act*** post-911 has effectively eliminated the Fourth Amendment. Nevertheless, it was this prominent event that inaugurated the resistance of the colonies to the oppressions of the mother country. It was John Adams who was there and said ***"Then and there, was the first scene of the first act of opposition to the arbitrary claims of Great Britain. Then and there, the child Independence was born."*** Again, it was all about searching your home to see if you owed anything to the king. It is always about money.

The American Revolution in 1776 sparked the French Revolution by 1789. It is not materialism of all individuals that is the problem for that is human nature and there is no period in history where such a state existed for hundreds or thousands of years of total bliss. This is just gibberish. There are some who seek POWER and that is the oligarchy that always emerges. This is not the majority, but a selected few who pull the strings behind the curtain of government. This is why history repeats because the passions of man simply do not change. There were corrupt politicians in ancient Greece (Draco) and Rome (Cato) just as there are today.

Consequently, those that insist this 13th Baktun uniquely signifies an age where humanity forgets all knowledge of its connection to nature and total bliss will emerge are either smoking something or are covert operators of the

oligarchy trying to convince people to hand all rights, liberty, and property to government. This 13th Baktun that began in 1618 with the ***Age of Enlightenment,*** will perhaps be followed with a new evolution in government structure where perhaps we will take one step forward and not backwards.

Mankind was emerging from the Dark Ages, overthrew his shackles ruled by monarchy and religion (separation of church and state), and began to explore nature adopting observation to understand that even the polarity of the earth indeed flips. It is hard to cast this age as one of materialism and forgetfulness when in fact the age before was serfdom and oppression not bliss. If tilling the soil is bliss being one with nature, then you have the freedom to become a farmer, but no right to force that upon everyone else.

This is simply a cycle whereby at the end we are at the extreme of the cycle of political change where there is a lack of ethics thanks to corruption instigated by an oligarchy. However, that realization is to be expected at the end of each cycle. Both government and the individual move toward corruption and self-interest and that is what will culminate in the cycle conclusion. To claim this is the entire cycle was materialism is this same thinking of Marx that led to the slaughter of so many millions.

It was the rebirth of international trade by the merchants between northern Italy and Constantinople bringing back spices and luxuries that opened the minds to a new age. What has always traveled with goods every time is ideas. The merchants earned money and they began banking and this inspired the rebirth of commerce. They saw an arbitrage to buy goods in the East and sell them at a profit in the West that rekindled society. It was the development of merchants that brought ideas from the East to the West and in fact reinvented banking and brought back books and ideas. It was Fibonacci who brought to Europe Arabic numbers and gave birth once again to mathematics.

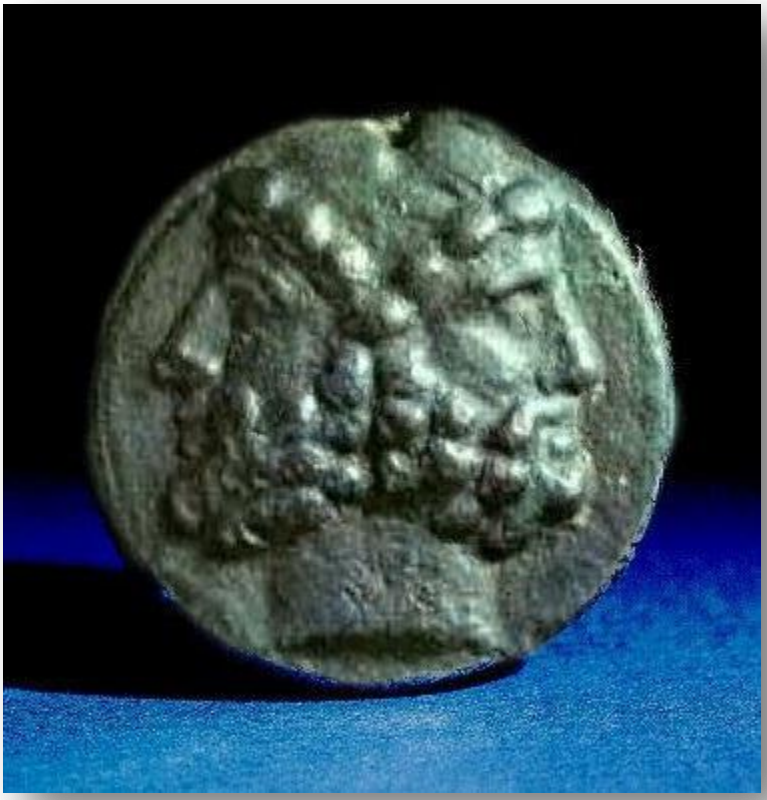
After 1000AD and the idea that the world was coming to an end with the Second Coming of Christ, this is when travel to the Holy Land began. It was the movement of these traveling pilgrims that led to “highway robbery” and the need for their protection, which gave birth to the Knights Templar. Events leading up to the Crusades began in 1071 when the Seljuk Turks decisively defeated the Byzantine army, played a vital role in bringing Europe out of the Dark Ages. Call that materialism if you will. However, unless there is some gain to be had, human nature will not respond.

Alexius I Comnenus
(1048/1056–1118)

The Byzantine emperor, **Alexius I Comnenus** (1048/1056–1118) feared that all Asia Minor would be overrun by the Turks. He called on fellow Christian leaders and the Pope to come to the aid of Constantinople by undertaking a pilgrimage or a crusade that would free Jerusalem from the 372 year old Muslim rule. Pope Urban II (ca. 1042 – 1099) called for the Crusades at the Council of Clermont on the 27th of November 1095. It was the Crusaders who brought back more than knowledge of the ancient ways, art, books, and learning, they also brought back the practice of bathing that did not exist in much of Western Europe.

It is interesting that the dominance of the Arab world ended in about 400 years or one Baktun. Where the **Renaissance** marked the beginning of one cycle, 1200 to 1600, it now appears that the current cycle 1618 to 2012 may mark the culmination of the Mayan 13th Baktun and hence the **Sovereign Debt Crisis** could mark its end providing significant political change once again. The real question that hangs in the balance is simply can we learn from the past to ever move forward? If we are to progress into the future, we must reform government and adopt a real democracy where the people directly vote on all major proposals. As long as we have republics with a professional class of politicians, we will have oligarchies hiding behind the curtain pulling the strings. Adopt a real Athenian Democracy rather than a Roman Republic and for once we may actually advance as a society. To claim this is merely an Age of Materialism and we should give up all property is Marx all over again – an experiment that failed because you cannot eliminate the business cycle or human nature.

Chapter XVI



A New Beginning

It is clear from a understanding of the Maya and their divination of **TIME**, that December 21st, 2012 will not be the end of the world but rather a new beginning. Indeed, the Mayans recognized that we are approaching the End of a World Age. The Mayan ideas were **NOT** the expectation of the end of the world, but rather a transition from one cycle to the next much as is depicted by the image of the Roman god Janus with one face looking backward at the past and the other looking forward at the future. True, the Hopi Indians also saw this same period as a ***New World Age***. However, they were most likely influenced by the Maya.

Nero (53-68AD) Æ Sestertius
Temple of Janus

The Mayan elders by no means prophesized that everything would come to an end in 2012; but they did point to this time as a major shift in the beliefs of society. They used this cycle to also start anew. The Maya founded the city of Copan precisely because of this cycle at its beginning as a good omen. The Copan dynasty lasted for about the full cycle of 394.26 years. The 16th ruler of *Copan* died at the end of the 10th Baktun and the city collapsed. The city of Copan was born with the cycle. This was simply one Baktun.

The Roman god Janus' temple had doors at each end as pictured here on a coin of Emperor Nero (53-68AD). The doors remained closed during times of peace for nothing would ever change. However, during periods of war, the doors remained open symbolizing that the wind of change was possible and nothing was ever certain. When you celebrate News Years' Eve and sing ***Auld Lang Syne***, this is a traditional song widespread in English-speaking countries, where it is saying goodbye to the old year and during leave of students, soldiers, and co-workers upon retirement and hello to the new age at your door. It is a Scottish expression meaning ***"the good old days"***. The song is an invitation to remember with gratitude the old friends and the happy time spent with them. The song dates back to the 16th century and it became a Scottish tradition to say good bye to the old year and hello to the new. In London, the Scottish residents gathered outside of St. Paul's Church and sang ***Auld Lang Syne*** and the bell was then struck 12 times. It was being sung even in America by the 19th century. This is the Roman tradition as well where Janus, for whom January is named after, is looking back at the past and looking forward to the future.

Indeed, the passing of a baktun was important to the Maya, for this was a time of transition from one World Age into another. The Roman expressed this concept best with their god Janus who looks both at the past, yet ahead at the future. This is what the 13th baktun really meant to the Maya.

In *Chumayel*, México, a little town in the state of Yucatán, information was found concerning astronomy, math, calendars, creation story, astrology, herbal medicine and the relationship between mankind has been cited by many as a source for 2012 doomsday prophecies for years. There are a series of *K'atun Prophecies* revolving around the K'atun Cycle which again is a unit of time with a full duration of 7,200 days (19.71 years). If we look at the past prophesies we see some correlating facts emerge. One of these prophecies is said to have foretold of the coming of bearded strangers from the East who would establish a new religion-the Spanish Conquest? Since South Americans did not have beards, it was certainly interesting. This time the prophecy also mentions the return of *Kukulcán*, the god Spirit of Wind, bringing us once again, a new religion, though "one without fear, a new beginning for the year 2012." Such stories may be more like Nostradamus insofar the prophecy depends upon the imagination of the interpreter.

Neptune (Latin: Neptūnus)
Roman god of water and the sea

Whatever the beliefs of a society, modern man tends to judge them by a standard of his own belief system. Hence, the Greeks were viewed as pagans worshiping a multitude of gods. Their belief is by no means the same context of God that we have today in Christianity, Judaism, or Islamic cultures. The ancient Greek belief in “gods” was more akin to what we call “saints” where there is someone that takes care of some particular thing, but by no means were they the creator. Our ideas of saints may in fact be a remnant of Greek and Egyptian religions where individuals were delegated some particular aspect of the world. For example, Poseidon (Greek: Ποσειδῶν) was one of the twelve Olympian deities whose domain was the sea. He was referred to also as the *Earth-Shaker* because they presumed that earthquakes took place under the sea. He was not the creator of man.The Roman version of Poseidon was called Neptune, who effectively was the same deity. Often one must look closely with an unbiased eye to comprehend what was the real thinking process at that moment in time for that particular culture. Unless you truly understand the thinking process, you will not understand what is meant by the various stories and legends.

Some Maya extremists claim that Rome's purpose in imposing the Julian calendar on the people they conquered was to take the power away from the people and to give that power then to

the state-Rome. What power is this? Some mystic inherent power they derived from a calendar based on the moon. A strange idea since if it was so great then why were they conquered? Caesar revised the calendar because the oligarchy was bribing the high priest to insert days in order to postpone elections. The priest was in charge of manually inserting leap days to adjust the moon calendar so that the seasons would remain in sync with the solar cycle. Caesar created a calendar simply to end the political corruption that knows no boundary in ant time period.

In their world, Rome forced the solar calendar upon people who had used the lunar system of the 28-day/13 moon calendar structure. They seem to attribute some mystical power to this nonsense and indeed, one is left speechless to even address such wild notions. Lunar systems are problematic and there is nothing there that creates some mystical power by counting days – it's just the moon! Don't you think since we are in a solar system and it is the sun that enables life not the moon, then why should the calendar be based upon a dead planet the revolves around the earth and would be invisible but for the sun?

Others argue that the Mayan people were very in tune with nature. This idea of finding some ancient culture that was utopia colored the initial findings of **Sir Eric Sidney Thompson** (1898–1975). He pictured the Maya as agricultural and peace loving being one with nature. **Sir Arthur Evans** (1851-1941) did the same regarding the Minoans, distancing them from the crude bloodthirsty Mycenaean Greeks. Both men upon discovering these two ancient civilizations saw **ONLY** what they wanted to see. This colored these civilization from the outset with a utopian hue, and it has been a reversal in trend ever since. Yet the Mayan extremists tend to fuel these wild stories that are designed to try to say somehow we should be following this utopian idea of some ancient culture that really never existed. Sorry! You cannot change humanity that way.

Perhaps we should be sacrificing the losing politician in an election to the gods and the victor should hold his heart to display to the crowd as proof of the divine will of God that he was to win and rule over us. The Maya were not the same blood thirsty culture of the Aztecs. Nonetheless, simply because the Maya did engage in sacrifice does not make them savages either. Sacrifice has been around in all cultures. Anyone remember the story when God tells Moses to go sacrifice his son?

The altar on the Temple of the Warriors at Chichén Itzá

Three Fates (or Moirae), Sisters

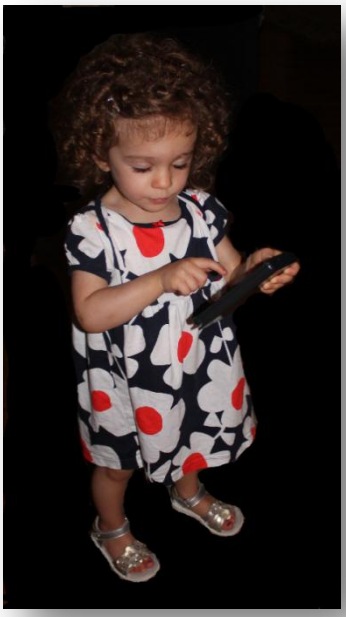
The Greeks believed there were the *Three Fates* (or Moirae), sisters depicted robed in white who were the “apportioners” that decided the future fate of man. Of the three, ***Atropos*** was the oldest and smallest in stature, but she was by far most terrible and feared considered to be the ***inevitable*** one. ***Lachesis*** sang of the things that ***were*** while ***Clotho*** was the "spinner" concerned with things that are as she spun the thread of life, the ***present***.

The Fates were often depicted as old, cruel and unmerciful, yet they were the most honored among the gods. They were seen as giving men at their birth their share of evil and good, and thus determined the character of men. Still they possess a unique stature for they could equally then punish the transgressions of both men and of gods. While Zeus, the King of the Olympian gods, could weigh the lives of men thereby judging them, he could only inform the three sisters of his decisions. The final decision rested always with the Fates thus making them the most powerful of all the deities. Hence, the future of man always rested in the whims of the Three Fates.

Zeus
Macedonian Silver Tetradrachm
Philip II (359-336 BC) Pella Mint

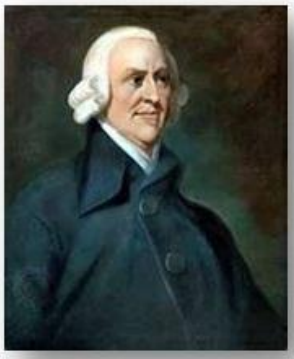
Roman goddess Fortuna was the deity of luck holding a Cornucopia symbolizing great fortune and the other hand is steering the rudder of a ship symbolizing she can change the direction of your fate at any moment

To a large extent the Roman goddess Fortuna perhaps symbolize what we face with the turning point of this 13th Baktun. She was always pictured holding a cornucopia in one arm showing she could make our future bountiful. In the other hand, she was steering the rudder of a ship symbolizing that it was within her power to change our fortune on a whim. This is what we face today but the rudder is turning against us.



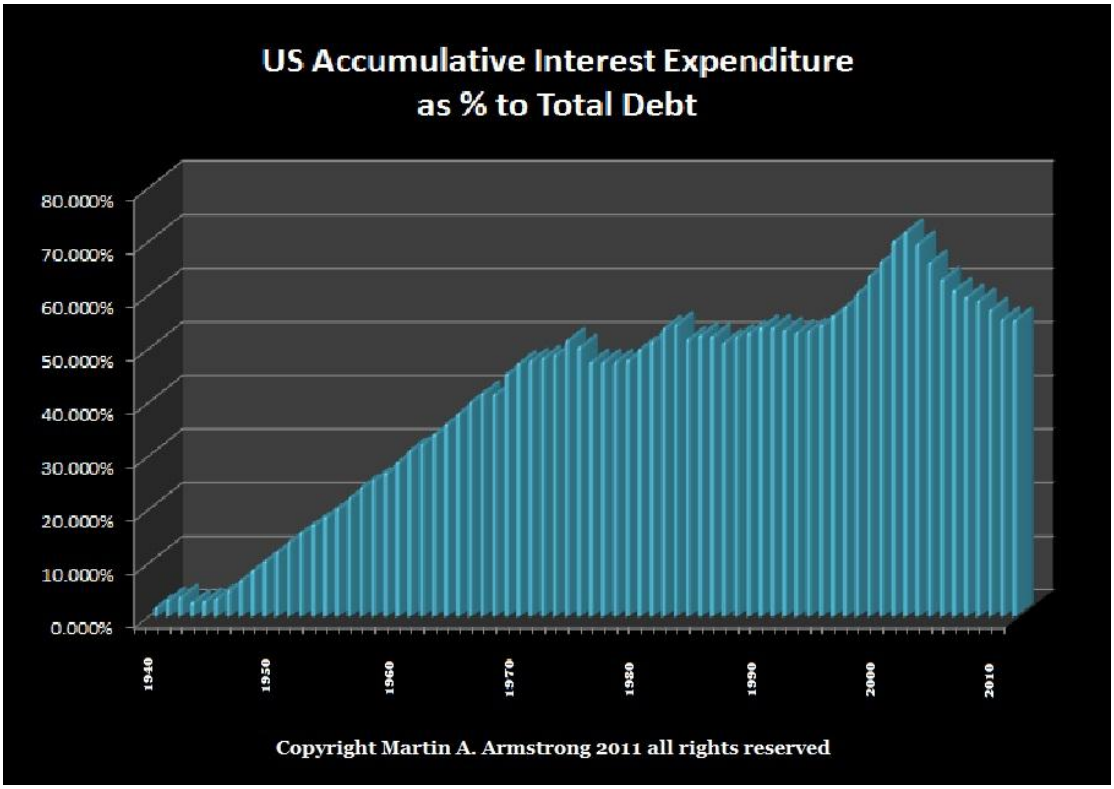
There is little doubt that government is collapsing. This is the fate of all nations and the collapse is systemic arising again once more from debt. We have been insanely borrowing money year after year with absolutely no plan on paying anything back. We need not consult gurus, soothsayers, ancients texts, or pray at the foot of Fortuna to ask what will she choose. A two year old with a pocket calculator can figure this one out – we are doomed. Eventually interest expenditures consume all revenue and it is not a question of rich v poor. More money went to bondholders to keep the debt rolling than will ever go to help anyone. This is simply how debt destroys everything. Interest consumes everything. If there is any materialism it is the demands for social programs to be paid with other people's money.

In our own contemporary context, this 13th Baktun, economically speaking, appears to be right on point. We are facing the final stages of the collapse of Marxism (socialism/communism) where the state dominates everything with its oligarchy pulling the strings behind the curtain. It is the ***Age of Materialism*** from the perspective of ***"vote for me and I will give you this!"*** Unfortunately, socialism is materialism for it all about taking the wealth of someone else for the redistribution to those who have less. The diehard Marxists see this as the ***Age of Materialism*** and can only see what individuals have and ignore the fact that the observer is also materialistic. Socialists demand the rich give them their assets by advocating we just hand more rights and property to government. They are blind to the fact that it has been the state that squanders the resources of the people and is incapable of managing society. Government is always greedy and wants to borrow what it thinks it will extract from the people for the next ten years right now.


Adam Smith (1723-1790)

Adam Smith (1723-1790) in his ***Wealth of Nations*** examined the whole problem with debt. In Book 5, Chapter III entitled ***"Of Public Debts"*** he wrote: *"The present and the late king of Prussia are the only great princes of Europe who, since the death of Henry IV of France in 1610, are supposed to have amassed any considerable treasure. The parsimony which leads to accumulation has become almost as rare in republican as in monarchical governments. The Italian republics, the United Provinces of the Netherlands, are all in debt. The canton of Berne is the single republic in Europe which has amassed any considerable treasure. The other Swiss republics have not."* Indeed, Smith came to the realization that the form of government did not even matter be it a king or republic for the national debts of all nations today stand as witness to that statement. No nation has amassed a treasury. All simply owe debt. Smith explained why socialism/communism has failed:

> *"A country abounding with merchants and manufacturers necessarily abounds with a set of people through whose hands not only their own capitals, but the capitals of all those who either lend them money, or trust them with goods, pass as frequently, or more frequently, than the revenue of a private man, who, without trade or business, lives upon his income, passes through his hands. The revenue of such a man can regularly pass through his hands only once in a year. But the whole amount of the capital and credit of a merchant, who deals in a trade of which the returns are very quick, may sometimes pass through his hands two, three, or four times a year. A country abounding with merchants and manufacturers, therefore, necessarily abounds with a set of people who have it at all times in their power to advance, if they choose to do so, a very large sum of money to government."* **Book 5, Chapter III**



What Smith is talking about is that the very structure of society is dependent upon the velocity of money and it is this concentration of capital that ironically provides the foundation from which governments borrow. It is true that a collective pension can also lend and does to government. However, Smith is also illustrating that a more entrepreneurial a national system is, the more rapid it will grow for the velocity of money will be greater. This is why China has been exploding much more rapidly than Japan ever did postwar - entrepreneurship.

Nonetheless, Smith notes that governments, regardless of the structure, were simply far too corrupt and are incapable of simple fiscal management. He put it best;

> *"It is the highest impertinence and presumption, therefore, in kings and ministers, to pretend to watch over the economy of private people, and to restrain their expense, either by sumptuary laws, or by prohibiting the importation of foreign luxuries. They are themselves always, and without any exception, the greatest spendthrifts in the society. Let them look well after their own expense, and they may safely trust private people with theirs. If their own extravagance does not ruin the state, that of their subjects never will."*
>
> ***BOOK TWO; CHAPTER III***

Just look at the US national debt illustrated above. Almost 70% is accumulative interest expenditures. All this money does not go to help the poor. It is going to support the rolling of the debt to keep government in control and the oligarchy fat and happy. Eventually, the interest costs will crowd out everything and society as we know it today will collapse just as

every empire has died before us – in chaotic fiscal mismanagement. The interest expenditures will consume everything and that eventually leads to civil unrest as we have seen in Southern Europe.

Governments have squandered the resources of the people altering society in the process. Where families were once close and had a sense of responsibility to take care of one another, the state has replaced those ties and now taking care of one's family in such states is no longer seen as expected or a duty. Such family ties remain in countries that were behind the Iron Curtain such as Ukraine or South America not to mention Mexico. Even in China, the one child rule has led to the destruction of the family social network. Elderly couples are now bringing in young girls from Southeast Asia to take care of them and in return they are left with all the property.

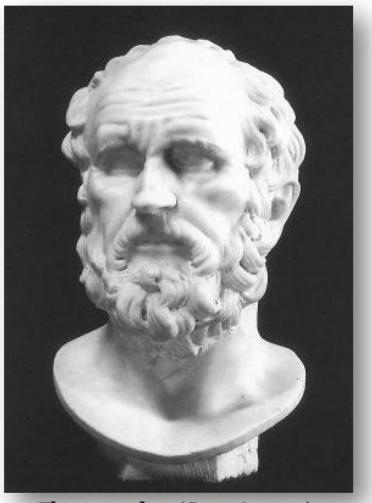
Marxism has altered society systemically destroying the family unit replacing it with the state. There is nothing left of the old world traditions. In this respect, the 13th Baktun may be the marker for a dramatic change historically. It is not one of ending materialism and handing all property to the state along with our liberty and freedom, which is the central tenet of the Marxist goals of socialism, communism and its offshoot fascism. Lenin, Stalin, Mao, Hitler, are just a few examples of Marxist theory and its movers and shakers.

When Hitler came to power, he made it a crime for a German to have a bank account outside of Germany in 1933. By 1934, Switzerland instituted its secrecy laws that once protected individuals from Hitler. Today, Switzerland has been assaulted by both Germany and the United States hunting down their own citizens to confiscate all their wealth to keep the debts rolling and the bankers paid. The independence and integrity of Switzerland have collapsed in the face of demands from the United States and Germany where the former threatens to confiscate all the property of the Swiss in America if they do not hand over Americans, and Germany is bribing bank clerks in Switzerland to illegally hand them the bank's German clients. Governments today have no respect for international law and will do whatever it takes to stay in power meaning paying interest to keep the debts rolling,

The greed of the state has replaced the individual and moral ethics have vanished from the state entirely not unlike Hitler who began targeting the bankers, who happened to be Jewish, and then expanded his confiscation of property to all Jews. Actually, Edward I ***(Longshanks)*** (1272-1307) of England, Henry IV (1285-1314) of France, and the Spanish Inquisition may have used religion as the excuse for targeting the Jews, but it always involved seizing their assets. In 2011, the United States enacted a law stating that any foreign entity dealing with an American must report what that person is doing overseas or have their assets confiscated in the USA. Never in the history of civilization has a nation so brutally disregarded international law all for the sole purpose of hunting down the "rich" to fund the debt to ensure it continues to roll. The

German bribing of Swiss bank employees to turnover lists of German citizens has violated every international law on the books. Even in America it is a crime for any citizen to bribe a foreign person to get business.

In Plato's Republic we find the debate between **Socrates** (Σωκράτης) (ca. 469–399BC) and the sophist **Thrasymachus** (Θρασύμαχος) (ca. 459-400BC). **Socrates** made the mistake believing that a democracy, composed of the people rather than a tyrant, would somehow ensure that justice would always prevail. **Thrasymachus** disagreed and captured the very essence of what all governments truly are – a entity whose power over people is its goal. **Thrasymachus** saw the true fate of the ***Rule of Law***. He said as recorded by Plato:


Thrasymachus (Θρασύμαχος)
(ca. 459-400 BC)

> *"the different forms of government make laws democratical, aristocratical, tyrannical, with a view to their several interests; and these laws, which are made by them for their own interests, are the justice which they deliver to their subjects, and him who transgresses them they punish as a breaker of the law, and unjust. And that is what I mean when I say that in all states there is the same principle of justice, which is the interest of the government; and as the government must be supposed to have power, the only reasonable conclusion is, that everywhere there is one principle of justice, which is the interest of the stronger."*

Aristotle in his Politics magnanimously wrote that the "***Law should govern***". However, while the ***Rule of Law*** implies that every citizen is subject to the law and is entitled to equal rights and justice, this has once again collapsed into dust. Law is only for the ruled and it stands in contrast to the idea that the ruler is above the law. The United States still claims the ***Divine Right of Kings*** and is above the law possessing ***Sovereign Immunity***. You cannot bring suit against the state without its permission. You can bring suit against an employee of the state for violating his duty, but you cannot bring suit against the state directly itself for it is above the law.

For example a baktun has 144000 days which equals 394.26 years. If we take the date December 21st, 2012, which is 2012.972, and we subtract one baktun, we arrive at 1618.712. It was 1618 that actually began a trend that would lead to the overthrow of monarchy. On May 23rd, 1618, the 30 Years War began with the bureaucrats ***(imperial civil servants)*** being thrown out a window of Prague Castle. On October 29th, 1618, the English adventurer, writer, and courtier Sir Walter Raleigh (1554-1618) was beheaded for allegedly conspiring against James I (1603-1625) of England. It was his trial that began the process of legal reform being able to

confront your accuser. The King wanted Raleigh dead and his bureaucrats ensured that would happen. The prosecutors (King's lawyers of Shakespeare fame) threatened another individual with death unless he wrote a letter accusing Raleigh of conspiring against the King. Raleigh was denied the right to question the person who wrote the letter and was beheaded. Even the judges later admitted Raleigh was never given a fair trial. By 1689, there is the English Revolution and the English ***Bill of Rights*** is born.

King Charles I (b 1600; 1625-1649)

In 1640, King Charles I (b 1600; 1625-1649) needed money and at that time the people had to consent to being taxed. He was compelled to convene Parliament and Oliver Cromwell (1599-1658) was one of many MPs who strenuously opposed the imposition of new taxes until the king had agreed to govern with the consent of parliament both in the administrative and religious worlds. It was this inability to reach an agreement that led to the outbreak of English Civil War (1642–1651), which was an armed conflict between the Parliamentarians (Roundheads) and Royalists (Cavaliers). This ended with King Charles I being beheaded on January 30th, 1649.

Oliver Cromwell (1599–1658)(Lord Protector until he died 1653-1658)

The first conflict of the Civil War was (1642–1646) and the second was (1648–1649). This pitted the supporters of King Charles I against the supporters of the Long Parliament, while the third war (1649–51) saw fighting between supporters of King Charles II and supporters of the Rump Parliament. The Civil War ended with the Parliamentary victory at the Battle of Worcester on September 3rd, 1651 and the creation of what people called the Commonwealth of England 1653 to 1659, with Oliver Cromwell merely replacing the king's portrait on the coinage with his own wearing a olive branch pictured as Caesar as was the King. Consequently, 1618 is where we draw the line for the beginning of a ***New World Age*** where monarchy would be overthrown as the supreme ruler over man. We then moved into an ***Age of Republicanism*** and the question would be are we headed into an ***Age of Democracy***?

If these Maya baktuns mark such major political changes within society, then with governments collapsing currently in debt, we may find that indeed we stand on the threshold of a ***New World Age*** hopefully of REAL Democracy ending the corruption of Republics and Oligarchies. This would be the next step in the evolution process of mankind's society structure. Indeed, society has become like a tall summer drink with a straw and government has frantically drawn the very last drop just sucking air desperately in need of cash and destroying the last moorings of civilization. The fiscal mismanagement of government has been the prime mover that creates war and the oppression of human rights.

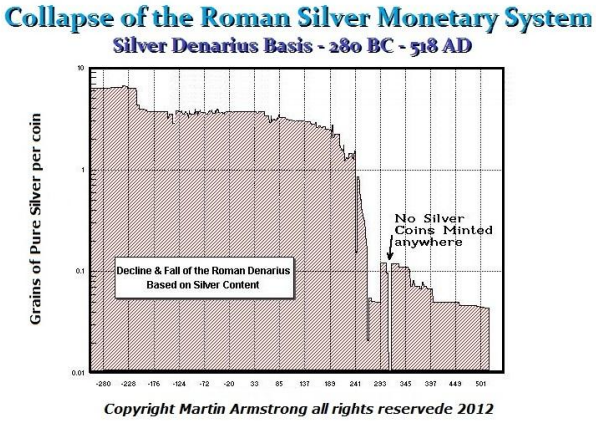
What Marx did was try to eliminate the business cycle. Just as communism failed in 1989-1991, the same ideas that government can eliminate the business cycle under the ***"New Economics"*** of the Keynesian theory could create the perfect world have crumbled falling to the ground into a heap of dust. Governments that began under the theory of protecting people, now regard them as the enemy and economic slaves to be milked and stripped of all rights to sustain their power. These theories have assumed that dictating how the economy should function is entirely within the power of government.

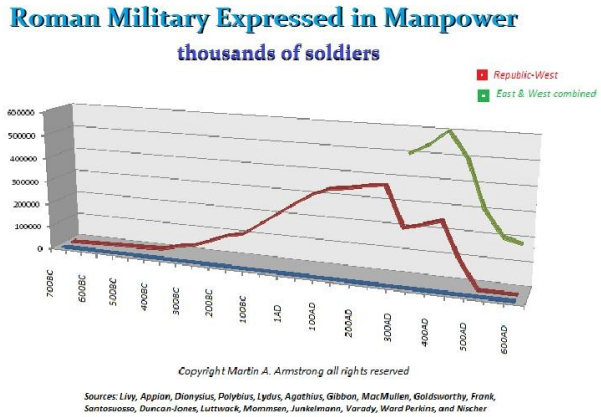
Julian the Apostate (360-363AD)

Governments have always rejected the idea that they are subject to the same basic laws as the people with the sole exception of the one pagan Roman Emperor Julian II (the Apostate) (360-363AD). It was Julian II who renounced the idea that an emperor was above the law. He insisted that the law was universal. He was against Christianity because of the death of Constantine the Great, his sons slaughtered in the Midnight Massacre all relatives who might claim the throne. Julian's father was among those killed and he turned anti-Christian when he saw that it did not alter humand nature. Julian began to issue coins displaying pagan deities.

Pagan Issues of Julian II (the Apostate) (360-363AD)

Just as Charles I had refused to yield any power asserting the ***Divine Right of Kings*** that he possessed to rule that cost him his head at the hand of Cromwell, government today still claims that same power of being above the law under the legal doctrine ***Sovereign Immunity***. We have replaced the king only with ministers who have asserted the same powers. The people are always enslaved and their labor exploited to sustain the power of government regardless of its form. Consequently, the real question becomes; shall this 13th Baktun actually mark the beginning of a seachange in political evolution? Will we shed the "republican" form of government with professional classes of politicians such as Cromwell and follow the Greek model of "democracy" where the people vote on **EVERY** proposal to really end fiscal mismanagement and tyranny? Will we ever adopt the integrity of Julian the Apostate where government is held to the same moral and ethical standards of the Rule of Law as that applied to the people?





Historically, governments always respond in the same manner when threatened with a loss of power – sheer force. Because governments always pursue only their self-interests of maintaining power and authority, it is never the wellbeing of the people that is a priority. The collapse of Rome was caused by unfunded promises of pensions for the army. The Roman coinage was debased substantially (inflation) in an effort to meet those liabilities. Today, the countless unfunded promises made by politicians loom on the horizon waiting for the day of reckoning. People have counted on such things for their retirement. What will happen when the expectations of promises made by government simply cannot be met not because the rich do not pay their fair share, but because the interest expenditures consume all revenue and spending?

The message the Maya have provided is by no means the end of the world. We will not be sucked into some black hole. There will be no fire in the sky from falling asteroids. What we

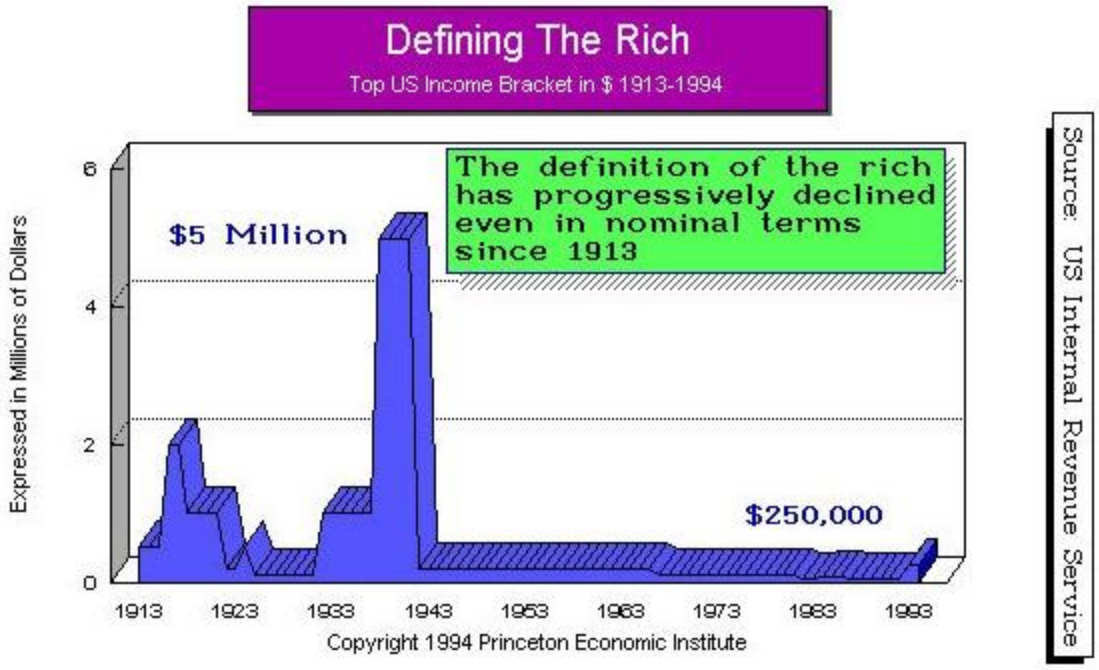
face is far more dangerous. We face the breakdown and collapse of Western Society as it has ALWAYS suffered from governmental fiscal mismanagement.

The Maya saw these baktuns as part of the Cycle of Life with markers where society will hopefully learn from the past and advance for the future, meaning we stop this cycle of debt for government is incapable of fiscal management. In trading, most losses take place because you sit before a screen and become bored so you start to trade just to do something. When you have a professional political class as a full time job, they start passing billions of laws just to do something even when they have no clue about the subject matter that they are legislating.

We are at a crossroads where we face a profound choice. Will we for once learn from the past? Or will we be once again like crabs in a bucket that are incapable of getting out because they keep grabbing the one in front trying to advance and they both fall back. We do not consult history and we are too stupid to figure out we have been here before. How many times do you have to stick your finger in the flame of a candle before you put two-and-two together and realize this shit hurts?

What the future concerns is our making a choice of how we enter this ***New World Age*** that lies ahead. Understanding our past is essential to moving forward. The Marxists want to still blame the "rich" and want their property confiscated a pick what scraps are left from the carcass, yet claim they are not materialistic despite being obsessed with other people's money. They fail to realize that the doctrine they espouse even violates the **Ten Commandments** – coveting thy neighbor's property. Never did the **Ten Commandments** say everyone had to have the same wealth. God created equal rights – not equal talent. I doubt they have a picture of Marx in any church, temple, or mosque portrayed as the infallible deity to be worshiped.

This not the ***Age of Materialism*** to justify hunting down the rich and confiscating all their wealth as the Marxists try to inspire and socialists are once again espousing. Just look at Obama's vitriol during the election of 2012. The definition of the rich used by the US government is **HOUSEHOLD** income of $250,000. Vice President Joe Biden in his television debate spoke of them with such distain labeling them as the ***"super rich"*** making everyone think it is Bill Gates and Warren Buffett. There are so few of those people around that confiscating everything they have will not balance the budget for a single year.



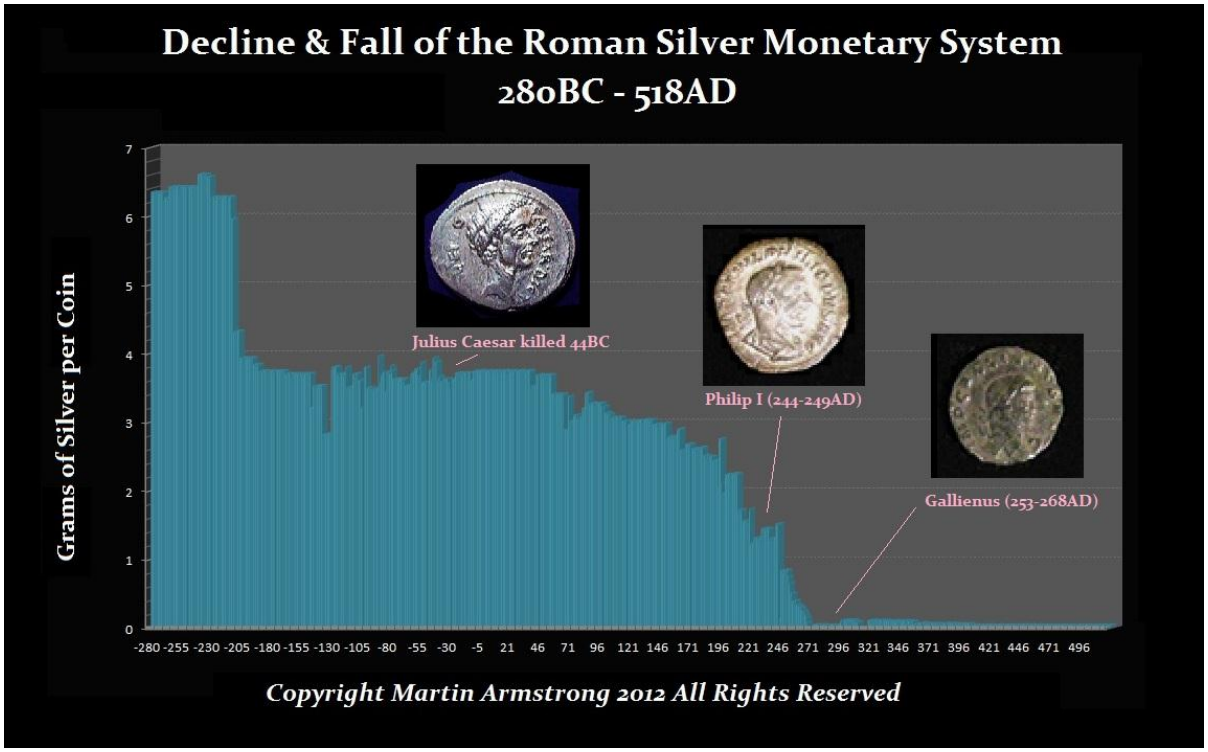
Nonetheless, labels like the ***"super rich"*** confuse the people and inspire such class-warfare that is extremely dangerous for it was the same motivation used by Hitler to get the Jews that began as the "rich" bankers. The Definition of the rich has been persistently lowered to increase revenue for the state while never publicly saying who they are hunting down; but what the hell! It sounds good! In Australia they sold the luxury tax claiming they would tax fur coats, Ferraris, and French wines. It passed and included all electrical products as well. They just always lie.

In Germany the socialists refused the offer of Switzerland to collect taxes from Germans and hand the amount collectively to Germany. The Socialists rejected the offer when every other state accepted that structure claiming they want to know who has accounts there so they can drag them through the streets and degrade them. Obviously, this is not about money, but class hatred. If there is a danger of war and civil unrest with 13th Baktun turning very nasty it is because of these people who violate the **Ten Commandments** and covet the wealth of anyone who has more than them who they paint as criminals. If someone comes into your home and says ***"give me all your money because it is not fair that you have more than me so God has authorized me to punish you by taking your wealth for myself",*** what would you say? Are they mad?

Historically, if the Maya are correct this will be the beginning of a ***New World Age,*** we have to be careful. Yes this could be wonderful if government suddenly realized this will not work and that interest expenditure will crowd out all other spending. No matter how many people they

hunt down they cannot make the system function. Magnanimously, government would just reform and relinquish the reins of power because it really cares about society. Right! The likelihood of that is less than discovering the Fountain of Youth in Florida. Human nature does not work that way. It is more likely we face a time of great upheaval, which appears will manifest within the economy and destroy the finest plans of mice and men. Our economic infrastructure is falling apart because we have lived in this age of coveting their neighbors' goods thanks to Karl Marx and then government has borrowed against those expectations of revenue with no plan of paying anything back.

Some claim it is the rich and how they covet wealth, but it takes two to covet and the Marxists know where to look. What they do not realize is to confiscate other people's wealth means we have to abandon civilization with the central tenet being equal protection of the law must be fiction. Once you strip one group of their right to property, you do the same to yourself. That is why communism failed. It could not alter human nature nor prevent the business cycle that is in part driven by nature and the cycle of the 4 seasons.



Communism produced the deprivation of all basic liberty. Once all property belonged to the state the result was suddenly you could not move yourself because the state owned all property and you had to request permission to move. We saw this same result emerge during the reform attempts to stabilize the economy by Diocletian (284-305AD) that included similar deprivations of liberty. It is true that Diocletian attempted to restore the Roman Empire and end the devastating economic decline. The early silver didrachm of 280BC was replaced by the

The Monetary Reform of Diocletian (284-305AD)

Post-Reform

Aureus (5.34 grams)

Argentius
(3.28 grams) 96 to pound

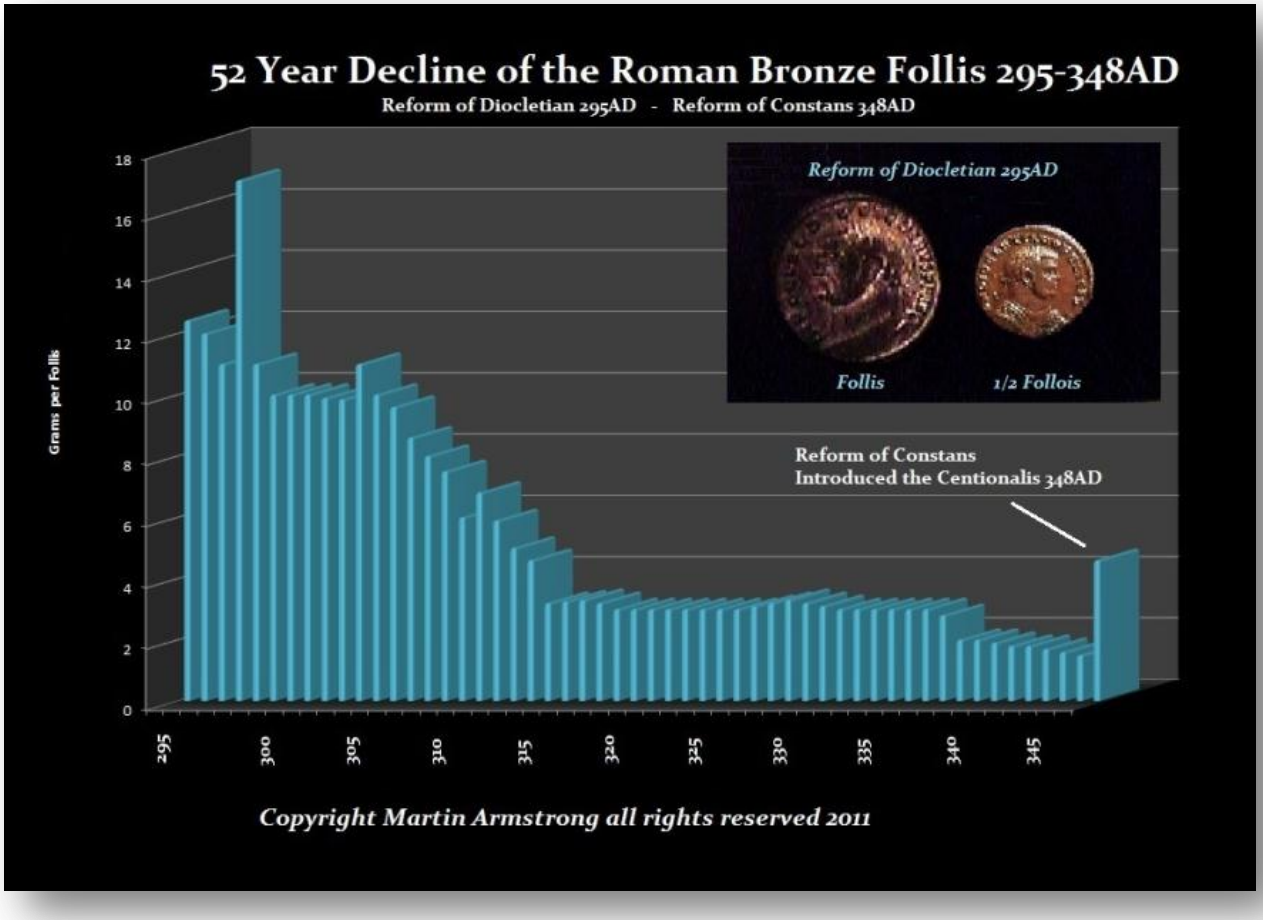
Antoninianus (Radiate)
(Bronze Silver Washed)
(3.90 grams)

AE Follis (10 grams)
(Bronze Silver Washed)

denarius in 211BC taking the weight down from 6.9 grams to 4.36 grams at 98% pure silver. The denarius fell to 4 grams by 80BC and then 3.7 by the time of Caesar in 45BC. Nero (54-68AD) began the debasement dropping the silver content to 97% and the weight fell to 3.36 grams in 64AD. It was a steady decline that collapsed to virtually no silver content by the time of Gallienus (253-268AD).

It was Diocletian (284-305AD) who revised the monetary system reintroducing silver coinage along with wage and price controls to prevent inflation. He ordered a census of men and women and ruled that they could not travel to ensure taxation. He also ordered that they could not change jobs just like the communists. When the tax system still failed to produce the revenue expected, towns were then taxed as a whole in ***kind*** demanding grain, timber, or oil in payment.

Diocletian's edict fixed a maximum of prices throughout the empire, for all the necessities and commodities of life. The preamble insists, with great vehemence on the extortion and inhumanity of the venders and merchants not unlike the modern definition of inflation is the

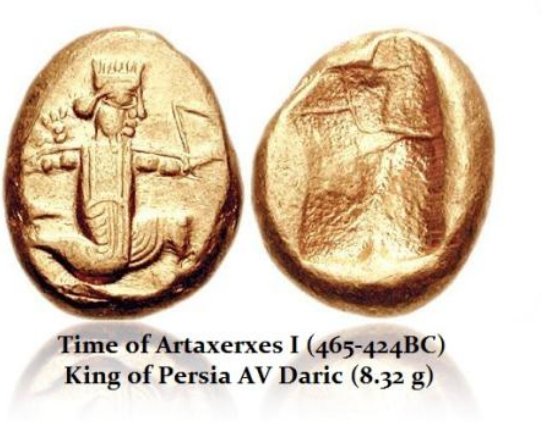


rise in ***prices*** rather than the decline in the ***purchasing power*** of the currency. ("***Quis enim adeo obtunisi (obtusi) pectores (is) et a sensu inhumanitatis extorris est qui ignorare potest immo non senserit in venalibus rebus quaevel in mercimoniis aguntur vel diurna urbium conversatione tractantur, in tantum se licen liam defusisse, ut effraenata libido rapien - rum copia nec annorum ubertatibus mitigaretur.***")

The edict was issued about 303AD and among the articles of which the maximum value is assessed, are oil, salt, honey, butchers' meat, poultry, game, fish, vegetables, fruit the wages of laborers and artisans, schoolmasters as well as skins, boots, shoes, harnesses, in addition to timber, corn, wine, and beer (*zythus*). The depreciation in the value of money had been so great that during the past century, butchers' meat that sold during the 2nd century AD in Rome for about 2 denarii per pound was now fixed at a maximum of 8 denarii to the pound.

The ***Follis***, which was a new bronze coin silver washed (chemically plated) introduced by Diocletian at 20 grams in 295AD, collapsed over the next 52 years by more than 90%. The maximum set for the wages of the agricultural laborers was 25 denarii. The edict was a desperate measure to cope with the economy. The debasement resumed and the reform failed.

Diocletian effectively created a passport but not to travel between countries. Instead, one needed permission just to move exactly as it was behind the Iron Curtain before 1989. One of the earliest known references to paperwork that served the role of a passport between nations is found in the Hebrew Bible. In the biblical verse, Nehemiah 2:7-9, attributed to 450 BC, it is believed that Nehemiah, an official serving King Artaxerxes I (465-424BC) of Persia, asked for leave to travel to Judea; the king granted leave and gave him a letter ***"to the governors beyond the river"*** requesting safe passage for him as he travelled through their lands. Yet the first formal passport is credited as being introduced by King Henry V (b 1386; 1413–1422) of England as a means of helping his subjects prove who they were in foreign lands.


Time of Artaxerxes I (465-424BC)
King of Persia AV Daric (8.32 g)

Today, we are drifting back in time to where human rights and civil liberties vanish when governments need cash. We have embarked on an age of pretend socialism that has undermined the very foundations of how society functions interfering with its natural adaptability of how it responds to threats and opportunities that Adam Smith investigated best known as his ***Invisible Hand***. We are moving through this period and our choice will be a ***New Age of Darkness & Authoritarianism*** or a ***New Age of Enlightenment*** if we can get through the rough parts and just for once begin to learn from the mistakes historically. We have been unable to acquire and retain the experience and knowledge of generations that have gone before us because the self-interest governs immediate events. That trend prevents honest reassessment of our collective past and applying real world solutions. Everything collectively has been lost for there is no accumulative knowledge and thus history repeats perpetually since the passions of man never change. Thus, we are confronted with the choice of either resistance or acceptance and as government crumbles before our eyes, we will be forced to make that choice upon which the future will be laid.

Yes there is the risk that this transition will be accompanied by cataclysmic political changes aside from the flipping of the poles and potential black holes. The concept of uniformity with its slow evolutionary process is man's preferred vision of how political and earth changes take place. However, history counsels such gradual peaceful outcomes are not possible. Even the Apostle Paul talked about abrupt change stating ***"we shall all be changed, in a moment, in the twinkling of an eye…"*** (1 Cor. 15:51-53). So these ideas of slow gradual changes in any system are just not supported by history be they sudden earthquakes or abrupt revolutions. While some tremble in fear of being sucked up by a black hole, we need not turn to the dramatic portrayals of nature and attribute that to the Maya as something inevitable. We are far more

capable of destroying ourselves politically in an abrupt event as a in the blink-of-an-eye. The Maya would just not know what to make of the mess we have gotten ourselves into Oli – and like Copan, perhaps we are looking at the collapse of our political structure not black holes. The Maya were not limited to natural events causing change. Man is more than capable of killing his own parents and society while the earth will be here when it is finished.