Sirius & Precession of the Solstice

6000 Years of Intercalation and Inundation

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Preface

The following abstract is an attempt to outline and discuss some of the key points regarding the origin, the development and the underlying astronomical principle of our modern calendar system and to demonstrate as clearly as possible its failures and successes in history.

Calendars and Chronology are regarded as complex and difficult subjects, for the simple reason that the fundamental unit for our reckoning of time is derived from celestial phenomena which never correspond to an absolute integer relationship. Although we call a “day” the time it takes for our planet to turn once around its axis, and refer to a “year” as the time it takes to go once around the Sun, the definition of these periods depends upon the motion of the Earth in relation to other celestial objects. All of our time is measured from a rotating Earth!

Long ago, mankind already recognized that a "day" relative to the Sun varies and differs from a "day" relative to the stars. It takes more than 29 days for the Moon to return to the same phase and the Sun does not return to the same position in the sky after exactly 365 days. Thus, some sort of comprise had been made in the past to record time and to eventually establish a functional calendar system. Throughout history the degree of perfection depended upon mankind's skills and methods of observation, as well as a clear understanding of celestial motions.

The view among scholars is that *the more advanced the culture, the better the calendar system*. Primitive man merely observed the seasons and lunar phases mainly for agricultural purposes, whereas early civilized man developed various lunar based solar calendars, for agricultural and ceremonial use. Eventually man invented telescopes and precise clocks, and arrived at a stellar based solar calendar – the hallmark of our modern civilization.

We consider ourselves the pinnacle of evolution - future discoveries merely require further scientific and technological advances. Any notion that man in remote epochs had detailed knowledge of the cyclical motion of the stars e.g., using them as markers for time, is quickly dismissed by experts either due to a lack of evidence or information. However, not everyone shares such a view. Some say that history amounts to a succession of continually re-emerging ancient civilizations, and that the rise and fall of such civilizations is somehow linked to a grand cycle of our Sun - a.k.a. the "Precession of the Equinoxes".

Perhaps the reason for our failure to contemplate such a notion is not so much a lack of scientific evidence, but rather our fear that the ancients discovered and understood the workings of the solar system and thus the underlying principle of the calendar. No matter how obscure or remote the evidence is, if such knowledge ever existed and fragments thereof survived ages of oblivion then somehow it would have to be reflected by man's system of time-reckoning; i.e. through the principle of the calendar itself.

PART 1

1. From Sothic to Chaotic Calendars

The Modern Calendar

If we ask someone "What day is today?" it is usually not because we have forgotten in which year or month we live in, but rather what day of the week it is. Ever since we went to Kindergarten we know that a week has seven days, which keep repeating over and over in the same sequence as they have done for thousands of years. But sometimes we are so busy in our weekly routines that we hardly think about the fact that a certain day in a certain month of the year is actually more important for an accurate reckoning of time than the rule that a particular day of the week is called Sunday, for instance.

However, it wasn't always like that. A little more than four centuries ago, the Fathers of the Church had a big problem on their hands. Relying on a lunar based solar calendar, they eventually noticed that their Easter Day, which they always wanted to celebrate on a Sunday following the fourteenth day of the paschal moon, whose fourteenth day followed the spring equinox, has diverged significantly from the latter. While this may sound like a religious problem; i.e. *"primarily a matter of ecclesiastical discipline"* as the Church has always maintained, it is in reality an astronomical problem. The Sun and the Moon in the heavens are not the same as the fictional Sun and the Moon of the calendar.

When in 325 CE [Common Era – AD] the Council of Nicaea already lay out some of the rules and principles regarding the celebration of Easter, the spring equinox did, in fact, occur on or around March

21st as it does nowadays. This was not one of those infamous astronomical coincidences, as we shall see later, but the result of careful astronomical observations in the past and a knowledge that has been lost.

For almost another 1300 years, as the world passed through some of its darkest ages, the established lunar-solar calendar of 365.25 days slowly diverged from the day of the spring equinox, which people in ancient times had always regarded as an auspicious day.
Monuments, dating back to prehistoric times can tell us still today the exact position of the equinoxes and the solstices. But over many thousands of years, with the deterioration of ancient stellar cults down from solar cults to lunar cults, the knowledge of how to keep track of solar-sidereal time almost completely vanished, especially it seems during the period from around 200 CE to 1582 CE (the year of the Calendar Reform).

It appears mankind was just too busy destroying each other. When through their periodic processes of war and invasions the soldiers of faith and fortune happened to stumble across genuine ancient knowledge, no sooner said than done was it burned and eradicated along with its former possessors. Even if some of the early invaders had "discovered" the great pyramid of Chichén-Itzá, they would have had no clue that this magnificent and ingenious monument represents more than a device to accurately observe the cycle of the equinoxes – hidden in the jungle it truly represented a symbol of a lost wisdom. Because long before medieval Europe conquered Mesoamerica, the ancestors of the Mayan possessed a functional calendar system that accounted for the minute yet crucial time difference that occurs between a year of 365.25 days and the actual solar year.

Scholars have unearthed, studied and interpreted as much as they could find, and when there was a lack of evidence or knowledge, Gods and myths served as explanations until only symbols, religious calendars, rituals and places of cult worship remained. While the real significance of the Mayan calendar seems to have been lost, we cannot deny the fact that it employs the same fundamental 4-year leap system that applies to our modern calendar. But in order to achieve greater accuracy over longer time frames, the ancient calendar makers discovered mathematical combinations and devised an ingenious system of leap-days that makes our modern calendar look primitive in comparison. They were fully aware of the fact that a solar year does not consist of 365.25 days or more, as there is strong evidence that they established a leap-day system that required the omission of one day approximately every **128.18 solar years**.

Calendars are chronological instruments to count days, weeks, months and years. However, without a precise knowledge of the fundamental time period, which forms the mathematical basis of the calendar system, the names given to days and groups of days have no meaning compared to the old astrological symbols. The basic unit for calculating time is the period it takes for Earth to make a complete revolution around the Sun. This time interval is the so-called tropical year, and modern observations have shown that it consists of 365.24219878 mean solar days.

And it is solely because of this difference; i.e. one day in about 128.18 solar years - that the 21st of March in Europe's old Julian calendar no longer occurred at the time of the vernal equinox. The reason it took the Church so long to correct it was in the end not so much a failure of making out the mistake itself, but rather a failure of understanding the reason for it and of course, a lack of knowledge of how to correct it.

In 1582 CE, with the help of a clever mathematician named Christophorus Clavius, the old-style calendar was finally corrected by 10 days, i.e. the accumulated astronomical time difference of one day every

128.18 years. A simple calculation proves that the solar calendar was correct until shortly before 300 CE:

$1582 - (10 \times 128.2) = 300$

In order to avoid a similar mishap, certain rules of intercalations were introduced to keep our civil calendar more or less in synch with Earth's solar or tropical year (at least for the next 3000 years or so).

The Ancient Egyptian Calendar

Regardless, we cannot blame early medieval Europeans for not knowing anything about advanced cultures that lived across oceans and beyond high mountain ranges. They could not destroy things that did not exist for them. Unfortunately, the situation was a lot different for a country called Egypt. It was easily accessible, as Alexander the Great had demonstrated so effectively prior to the times of the Romans and the Crusaders.

Historians inform us about all the glorious and gory details of the "tribal conflicts" that occurred, and a special branch of them, the Egyptologists, have specialized in that part of our history that deals exclusively with the culture of Ancient Egypt; commonly referred to as the Dynastic period or the Egypt of the Pharaohs.

In the past, many valuable discoveries have been made by archeologists, geologists and other fields of science including astronomy. Some Egyptologists still rely on excavations of pottery and other objects and are suspicious of mathematically dating the reigns of Kings and Pharaohs based on astronomical phenomena. Others, together with a number of scientists and researchers have formed a new branch of science, called archeo-astronomy. Thanks to the efforts of various independent researchers over the last few decades, and especially during the recent one, a new understanding of the knowledge of ancient (and more importantly pre-dynastic) Egypt gradually emerges from the sand – i.e. the sand that was thrown into our eyes. Because for some reason it was astronomers, and not necessarily Egyptologists, that set the course of events. According to them, the ancient Egyptians completely lacked any astronomical knowledge.

For instance, the scholar and astronomer Otto Neugebauer believed that *"...there is no astronomical phenomenon which possibly could impress on the mind of a primitive observer that a lunar month lasts 30 days and a solar year contains 365 days. Observation during one year is sufficient to convince anybody that in about six cases out of twelve the moon repeats all its phases in only 29 days and never in more than 30; and forty years' observation of the sun (e.g., of the dates of the equinoxes) must make it obvious that the year fell short by 10 days! The inevitable consequence of these facts is, it seems to me, that every theory of the origin of the Egyptian calendar which assumes an astronomical foundation is doomed to failure.....I still think that this theory is in perfect agreement with the structure of the Egyptian calendar, which has only three seasons, admittedly agricultural and not astronomical, and which has no reference to Sothis at all."*

O. Neugebauer, "The Origins of the Egyptian Calendar", JNES 1 (1942), 397-403

Neugebauer imagined that a period of 240 years was needed to establish a year of 365 days based on the periodic flooding of the river Nile (a hypothesis which already presumes that the duration of the year is 365 days!). The flooding did not always make its first appearance on a fixed day - even today the

fluctuations run over a period of six weeks and more (Neugebauer himself admitted that it can vary by as much as 60 days).

However, wishing to deduce an establishment of a Sothic year of 365.25 days based on the flooding of the Nile in relation to the remarkable astronomical phenomenon of the helical rising of Sirius is in the words of the Egyptologist R.A. Schwaller de Lubicz, *"a feat of skill which would dignify clairvoyance rather than ratiocination."*

R.A. Schwaller de Lubicz, "Sacred Science", Inner Traditions (1982)

At this point it would be interesting to mention that Otto Neugebauer, who wrote extensively about **Babylonian astronomy**, also discussed the so-called Solstice-Equinox-Sirius texts, which formed part of the "Astronomical Diaries". These texts list equinoxes, solstices, heliacal risings and settings of Sirius from the period of around 600 BCE and around 330 BCE. Apparently, the position of Sirius relative to the solstices and equinoxes did not change over time with precession. Neugebauer therefore, concludes: *"This is, incidentally, further evidence for the fact that the Babylonian astronomers were not aware of the existence of precession."*

Otto Neugebauer, "A History of Ancient Mathematical Astronomy" (Part 1, Page 543, Note 13)

We will see that Neugebauer could not have been any further from the truth - already for the ancient Egyptians, Sirius did *not* show any precession.

Precession of the Equinox - A Miracle of Greek Science?

1. Before we can understand the obstinacy on the part of some astronomers and Egyptologists in their desire to belittle the skills and the knowledge of the ancient Egyptian "priest-astronomers", we must first of all know more about the discovery of another cosmic phenomenon: *the Precession of the Equinox*.

The standard "party line" is that the phenomenon of *precession* was officially discovered by the Greek scholar Hipparchus, and nothing seems to lead our contemporary astronomers to think that the ancient Egyptians were aware of it. The trouble is that we know extremely few details (if any at all) about the alleged discovery of precession from Hipparchus himself. This includes some of his other major mathematical works.

Most of the information which we actually have about Hipparchus comes from the *Almagest* of Claudius Ptolemy, who evidently used Hipparchus' observations to construct his own astronomical/astrological system. Strangely, Hipparchus did not use a consistent coordinate system to specify stellar positions. His observations may have been accurate to a third of a degree but apparently they were made from different latitudes.
The value of *precession*, which he figured was about 46" per year, was most likely obtained through his attempts to calculate the approximate length of the tropical year and by comparing his finding with earlier results, presumably Babylonian parameters or astronomical references of Chaldaean and Egyptian origin. It should be noted that Ptolemy's fictive value for the *precession* (36") differs significantly from Hipparchus' assumptions, which were also based on a uniform circular motion of the sphere of the fixed stars and a fixed, non-rotating and non-orbiting Earth, since he used the wrong duration for the tropical year.

The question is from where and how did these early observers obtain the correct value of a sidereal year in order to determine precession; i.e. without knowing the exact length of the tropical year or the 360-degree revolution of the "Sun around the Earth"?

The late astronomer Robert R. Newton notes: *"...comparing the kinds of years would not have given the Greek astronomers an accurate value p* (precession*). In view of the difficulty of measuring stellar longitudes, the most accurate method available to them was probably the measurement of stellar declinations."*

Robert R. Newton, "The Origins of Ptolemy's Astronomical Parameter", Chapter V, "The Stars and the Precession of the Equinoxes", Center for Archaeoastronomy, College Park, Maryland (1982)

Limited by the accuracy of the construction of the available instruments (astrolabe), the observations and recordings depended largely upon the adopted value of the obliquity of the ecliptic itself, which was by no means perfectly known. But it seems mathematical theories were more important than accurate observations. According to Neugebauer, *"The ancient astronomers rightly had greater confidence in the accuracy of their mathematical theory than in their instruments."*

Robert R. Newton, "The Origins of Ptolemy's Astronomical Parameter", The Role of Observation in Ancient Greek Astronomy, Center for Archaeoastronomy, College Park, Maryland (1982)

Hipparchus' value may have been the result of such "technical" errors, but in the case of Ptolemy his "errors in observation" were more a problem of poor plagiarism.

Ptolemy's own work, the Syntaxis or better known as the Almagest, a monumental book containing a multitude of observations, catalogues and calculations, reigned for almost 1400 years as a nearly undisputed source for astronomical information throughout medieval Europe and Arabia. It has certainly shaped the history of science, influencing many great thinkers. Some modern scholars say that Ptolemy preserved Greek astronomy and ancient observations, while others like Robert Newton ("The Crimes of Claudius Ptolemy") are convinced that Ptolemy *"lost for us the genuine astronomy of the ancient world"*. Ptolemy apparently fabricated his observations and misreports those of earlier origin to match his own theories.

Newton concludes that, *"The Syntaxis has done more damage to astronomy than any other work ever written, and astronomy would be better off if it had never existed. Thus Ptolemy is not the greatest astronomer of antiquity, but he is something still more unusual: he is the most successful fraud in the history of science."*

Robert R. Newton, "The Origins of Ptolemy's Astronomical Parameter", Center for Archaeoastronomy, College Park, Maryland (1982)

Hipparchus and Ptolemy may have been victims of the age they lived in and neither one of them can defend themselves any longer against any allegations of "misconduct", although some of their modern-day advocates could. But after 2000 years of "Greek astronomy" they probably feel they don't have to. After all, Otto Neugebauer had made it clear for them that the Egyptian calendar *"is certainly not derived from astronomy"*.

And since no one can say for sure what went on in the mind of Hipparchus, who was one of the few well-known scholars of antiquity to have access to the Great Library of Alexandria where once more than five

hundred thousand books, scrolls, papyri and manuscripts were kept, we will never know what he may have read about precession or what inspired him to start his own observations to confirm it; i.e. the motion of the sphere of the fixed stars.

"Let those who, believing in observations, cause the stars to move around the poles of the zodiac by one degree in one hundred years toward the east, as Ptolemy and Hipparchos did before him, know ... that the Egyptians had already taught Plato about the movement of the fixed stars. Because they utilized previous observations which the Chaldeans had already made long before them with the same result, having again been instructed by the gods prior to the observations. And they did not speak just a single time, but many times ... of the advance of the fixed stars. (Proclos Diadochos, Commentaries on the Timaeus, IV)

R.A. Schwaller de Lubicz, "Sacred Science", Inner Traditions (1982)

Part 2

The Rise and Fall of the Calendar

"Sosigenes' Calendar Reform" - A Glimmer of Hope In Dark Times

By the time Ptolemy wrote his Syntaxis the world was already in turmoil, it was the beginning of the death of Greek astronomy and mankind was descending into a cataclysmic dark age. Almost two centuries earlier, when Julius Caesar's forces conquered Egypt in 48 BCE, part of the Great Library of Alexandria had gone up in flames – the first of a series of disasters to befall that grand repository of scientific and philosophical knowledge. Ultimately, the fate of the Library of Alexandria paralleled the widespread, silent disappearance
of the ancient science and wisdom from the face of the Earth.

Neither the Greeks* nor the Romans ever had a functional calendar that was in tune with the seasons. By the time Julius Caesar ruled over Egypt, the old Greco-Roman lunar style calendar was off by more than two months from the date of the equinox. What a defeat for the 'mightiest' man in the world to realize that only someone initiated in the Hermetic Tradition of ancient Egypt would be capable to restore the calendar to its original form.

* Apparently, around the fourth century BC the Greek Callippus had improved the earlier Athenian calendar of Melon and Euctemon by omitting one day every 76 years (Callippic cycle). However, his "365.25-day calendar reform" did not survive the following centuries.

From the Roman author Gaius Plinius Secundus (a.k.a. Pliny the Elder) we learn that *"... There were three main schools, the Chaldaean, the Egyptian, and the Greek; and to these a fourth was added in our country by Caesar during his dictatorship, who with the assistance of the learned astronomer Sosigenes (Sosigene perito scientiae eius adhibito) brought the separate years back into conformity with the course of the sun." (*http://www.rxs.bigstep.com/generic.html?pid=8*)*

Had it not been for the great Alexandrian scholar and astronomer Sosigenes, who was brought to Julius Caesar in 46 BCE to help him "overhaul" the Roman calendar, there would have never been any spring equinox occurring on March 21st in the subsequent years until roughly 300 CE – i.e. shortly before the Fathers of the Church debated their Easter problem due to their inadequate lunar based solar calendar.

Thus, the wise Sosigenes not just re-introduced the ancient Egyptian solar calendar with its well-known four-year leap day cycle, but also accounted for the secular error of one (leap) day every 128.18 solar years.
According to Hipparchus' wrong calculation of the tropical year that error would have amounted to one day in about 300 years.

For it is remarkable that Sosigenes' tropical calendar (*a.k.a. Julian calendar*) was kept accurate until approximately 300 CE, as the knowledge of its additional leap-day was being lost again for nearly another 1300 years!

Neither historians nor scientists can offer us any conclusive document (like a decree or reform) which shows that the Julian calendar had in any way been corrected by omitting three leap days over a period of less than 400 years following "Sosigenes' reform". Given the historical uncertainty as to which years from 43 BCE to 8 CE were counted as leap years, it appears *Modern Science* would rather attribute the accuracy of the calendar to *coincidence*.

As a reminder and symbol of a genuine surviving fragment of ancient wisdom, Sosigenes began the "new year" on the 1st of January 45 BCE, representing the first day of the month of Thoth in the tradition of the ancient "Sirius" calendar. Our New Years Day (*Silvester*) is a reflection of the age-old ritual, celebrating the return of Sirius to the mid-heaven position at midnight, which occurs around the first of January. Interestingly enough, for 2005 Earth's perihelion is also on January 1st - an event which hasn't happened in centuries.

The accuracy of the calendar was not the result of sheer coincidence, but the direct influence of an ever wakeful and periodically re-emerging flow of the perennial wisdom and knowledge coming forth throughout the ages, as in the tradition of the ancient Hermetic school.

By around 200 CE Clement of Alexandria still made reference to a catalogue of Egyptian Books, which contain in thirty six works the entire philosophy of the Egyptians. Among them were *"eight books dealing with the knowledge of what are called hieroglyphics and including cosmography, geography, the positions of the sun and moon, the phases of the five planets, the chorography of Egypt, the charting of the Nile and its phenomena, a description of the temples and of the places consecrated to them and information regarding the measures of all that is used in sacred rites. ... Four books dealing with the stars, one regarding moving stars, the other about the conjunction of the sun and moon, the other about their risings, confided to the Astronomer whose symbols are a clock and a palm branch."*

R.A. Schwaller de Lubicz, "Sacred Science", Inner Traditions (1982)

This most valuable collection of books was known to the Greeks under the name of *Hermetic Books* or the *Books of Thoth*, as they considered the author of these books to be the Egyptian sage Thoth – the god of wisdom.

The Cycle of Knowledge & The Calendar

1. Now the prosecution of individuals and esoteric groups started to get into full swing. In 389 CE flames finally destroyed the library of Alexandria. Hypatia, the famous daughter of Theon of Alexandria, who wrote some of the commentaries on Ptolemy's Syntaxis, embodied as a true victim of the times the end of Alexandrian science. In 415 CE, on her way to a lecture, she was brutally murdered by a mob of fanatic monks, who pulled her through the streets by her hair, peeled off her skin with seashells and

hacked her to pieces before she was burned alive. Violence and atrocities are always the direct result of human ignorance, a severe lack of compassion and a great loss of spiritual wisdom.

As a crucial turning point in the history of mankind's spiritual path of evolution, the fifth century saw further decline and chaos as the Roman Empire collapsed, and with it came the complete disappearance of the true knowledge of the ancient Egyptian Sothic calendar. Sirius and his companion play a central role in the Isis & Osiris mysteries, the sacred teachings of the ancient Egyptian culture which date back to at least 3100 BCE. These teachings remain a well-guarded secret as only the initiated priests had access to the "hermetic knowledge" – i.e. a hermetically sealed wisdom. But already with the invasion by the Persians around 525 BCE the hermetic priests had to disappear. They went into hiding and none of the later rulers of Egypt or any of the descendants of the Romans supported their re-appearance.

During these times people fought for pure survival and were no longer interested in a calendar that accurately kept track of time. According to the Yuga cycle theory of ancient India (**www.thegreatyear.com**), by 499 CE the intellect and state of man reached its lowest point (Kali Yuga) in the Sun's great cycle of about 24,000 years. It seems that man's state of awareness and his knowledge about the astronomical basis of the calendar is being reflected by the perfection of the calendar itself.

For the next thousand years or so the "civilized world" completely forgot how to keep the calendar in tune with the seasons, despite the fact that prehistoric monuments continue to exist in Europe (e.g. Stonehenge in England or the Externsteine in Germany) to observe the equinoxes and solstices. But these ancient observatories were regarded as cult places used by heathens for the worship of their pagan Gods. Europe was in the age of "witch hunts" and the systematic prosecution of heretics - an age during which more than a million innocent people were killed or burned alive at the stake.

Ptolemy was dead, long live Ptolemy! And he did - at least until about 1600 CE, the year Giordano Bruno, the Hermetic philosopher, was violently executed by the Church for his belief in an infinite universe. But that year also marked a further transition in the cycle of time – a slow but renewed awakening.

After the calendar reform of 1582 CE the days of the months were now counted in a cycle of 365.2425 days instead of 365.25 days. While the 4th of October 1582 was still the same day for both the Julian and the so-called Gregorian calendar, the next day (October 5th Julian) became October 15th in the Gregorian calendar. This reformation ensured that for the next 3320 years the spring equinox will be celebrated on March 21st, just as it occurred in the century before the year 325 CE when the Fathers of the Church discussed their Easter problem at the Council of Nicaea.

This implies that one could use the Gregorian or our modern civil calendar, which is almost identical to the duration of the tropical year, to go back and forth in time by thousands of years and the equinoxes will remain within a day on or around March 21st and September 21st, and the solstices on or around June 21st and December 21st.

So far so good, except that historians and astronomers still prefer to use the Julian calendar, projected backwards, to express dates in history as the inexact leap day system of a 365.25-day calendar avoids some of the complexities of the modern civil calendar. Nowadays, there are a number of computer programs available that make the conversion between the different calendars quite easy. For instance, if we have a June 21st 3420 BCE (Gregorian), it would correspond to the day July 19, 3421 BCE (Julian). Since the Julian calendar does not include the year 0, the year 1 BCE is followed by the year

1 CE, which makes it somewhat awkward for arithmetic calculations. Instead of using BCE dates, astronomers usually write the year 1 BCE as year 0 while the year -100 corresponds to 101 BCE, etc.

Sirius & The Origin of the Ancient Egyptian Calendar

Remember we were told that the ancient Egyptians 'did not derive their calendar from astronomy'. But they did have a calendar, and the majority of Egyptologists have accepted the year of the calendar's establishment around 4200 BCE. This date is not related (at least one would hope so) to the primitive medieval view that the world in general began six thousand years ago. On the contrary, this date is based on the Pyramid Texts which commenced in the year 2800 to 2600 BCE and which in an archaic style (i.e. from the beginning of the empire) provide us with numerous references to Sirius, revealing a profound knowledge of the heavens:

Pyr. 965: "Sothis is your beloved daughter who prepares yearly sustenance for you in this her name of 'New year'." (Pepi 189, M.355 and N. 906)

R.A. Schwaller de Lubicz, "Sacred Science", Inner Traditions (1982)

This implies that astronomical knowledge of the yearly motion of Sirius and regarding the day of the "New year" in the calendar predates the texts themselves.

Eduard Meyer, one of the earlier German Egyptologist who developed his 'Sothic theory' based for the most part on the information he found in Ptolemy's Almagest and on the classical evidence of Theon of Alexandria, concluded in his work *'Ägyptische Chronologie*':

"We can therefore affirm in all confidence that the Egyptian calendar was created to reflect that condition of the seasons which is presented to us in the year 4241 BC."

In the year 4241 BCE the "flooding of the Nile" occurred from July 19 to November 15 (Julian calendar), or as we know better from June 15 to October 12 according to our civil calendar. Meyer was convinced that for the entire beginning of the empire a perfect coincidence existed between the start of the flood season and the Sothic cycle marked by the so-called heliacal rising of the star Sirius. In order for his Sothic cycle to properly work, Meyer theorized that the Egyptians never corrected their 365 day calendar with regards to the seasons, and that all dates repeat every 1460 years. In other words, the day of the heliacal rising of Sirius would fall successively on each day of a "365-day" year. Any correction on the part of the ancient Egyptians before Roman times would, of course, invalidate his theory on the Sothic cycle.

The astronomer Richard A. Parker, who worked with Otto Neugebauer on the Egyptian Astronomical Texts yet rejected some of his notions on the 365 day calendar, refuted Meyer's Sothic theory and asserted that throughout dynastic times the Egyptians kept three calendars *"two lunar and religious, one civil"*, none of them based upon Sothis. He was, however, convinced that in pre-dynastic times the first Egyptian calendar had to be luni-stellar. Realizing that a lunar month must begin with some observable phase of the moon, Parker was seeking for a lunar phenomenon associated with the morning of the Egyptian day.

It is clear that such information obtained from ancient records, which mainly depend upon classical sources, remains vague and contradictory. Fortunately, the ancient Egyptians referred often and plainly enough to Sirius! Thus it seems, Parker had no problem to assume that *"whatever it* (the original

calendar) *may have been in prehistory, the first Egyptian calendar of record was lunar, and it was based upon the heliacal rising of the star Sothis."*

R. Parker, "The Calendars of Ancient Egypt", Studies in Ancient Oriental Civilization, No.26 (1950)

Since he found literary references* that primitive tribes in Mexico, New Zealand and Africa also used constellations and stars like the Pleiades, Orion, Rigel and Sirius to determine the beginning of the year which they divided into lunar months, it became immediately apparent to Parker as to why the Egyptians chose Sirius as the starting point for their "Nile-lunar calendar".

* *"Immediately after the discovery of America it was already reported of certain tribes on the Mexican coast that they began the year at the setting of the Pleiades and divided it into moon-months. In Loango (West coast of Africa) the months are counted from new moons, but Sirius, the rainy star, offers a means of correcting the reckoning sidereally."*

Nilsson, "Primitive Time-Reckoning", (Lund, 1920)

"In the winter season, the position of the Pleiades is observed to tell time. They are first at their zenith, later a bit past it, at sunrise. At the end of the winter season, they set when the sun rises. After the winter season, Orion's Belt (atanu) is used for time-keeping; the onions are sown when Orion rises at sunset."

Marcel Griaule & Germaine Dieterlen, "Le Renard Pâle",1965 - (English Edition "The Pale Fox", Continuum Foundation, 1986)

Obviously, Parker did not hear or read anything about the West African tribe of the Dogon and the detailed astronomical knowledge they possess about **Sirius**. He and his contemporary peers could have blamed their ignorance on a lack of information, since (according to the imaginations of some modern experts) in the 1920s a certain Maté and other missionaries from the 'White Fathers' decided to convey such detailed knowledge *only* to the chief priests of the Dogon and *not* to the rest of the scientific world.

Although Parker tinkered with the idea that a lunar calendar based on Sirius is *"either due to Egyptian influence or is a cultural survival out of the ancient Hamitic substratum of eastern Africa, from which Egypt drew so much"*, it was sufficient for him to establish the fact that *"the first Egyptian calendar need not have been the product of a highly developed culture. It had common roots with many other primitive calendars and must be characterized as quite normal and unspectacular. [...] How long a period passed before the formulation of the lunar calendar as suggested can only be guessed at."*

R. Parker, "The Calendars of Ancient Egypt", Studies in Ancient Oriental Civilization, No.26 (1950)

After explaining the food-producing lifestyle of the earliest Egyptians in rhythm with the river Nile, Parker surmises that some time in the fifth or fourth millennium BC the brightest star of all, Sirius, *"came to be recognized as the harbinger of the inundation."*

And since no grandmother ever told us otherwise, we learned by rote that in ancient times the highly irregular flooding of the Nile was associated with the extremely predictable celestial motion of Sirius. Our scholars believe - beyond a shadow of a doubt - that some 6000 years ago the position of Sirius in the sky was very different from what it is nowadays. Sirius does move - the question is, relative to what?

For many of the so-called primitive tribes a certain position of Sirius in the sky in relation to the Sun has always marked the first day of a calendar based on the seasons. Yet for the advancing Egyptian culture

the various lunar calendars governed by a 365-day agricultural calendar moved forward through the season without ever being corrected throughout the entire Egyptian history to the seasons or to the important first day of the first month of the solar year. How primitive, indeed! As cultures evolved, their knowledge of accurate calendar time-keeping declined.

Part 3

1. Sirius and the Summer Solstice

The Effect of Precession

At this point we may rightfully ask, "What has all of this to do with the phenomenon of Precession?" The calendar reform was not due to *precession*, although a hypothetically longer solar year leads to the same effect!

Precession is an observed celestial phenomenon that involves the apparent motion of the stars relative to the 'fixed' position of the Equinoxes and Solstices. For the record - and one can already hear some astronomers huffing and puffing (because they can't prove otherwise) - the length of the tropical year does *not* depend upon any adopted value of the precession!

Unfortunately, most astronomers do not study theoretical precession dynamics and are unfamiliar with all the required hypothetical movements, including the motion of Sirius.

Just as the motion of the Moon serves as a witness (solar eclipse phenomenon) for the Earth's 360-degree orbital motion around the Sun in a tropical year, so does Sirius.

It seems that against all of its beliefs, Modern Astronomy has actually **proven** that our entire heliocentric solar system moves around the Zodiac; not because of occult forces acting on the Earth, but because astronomers have completely failed to demonstrate that the Earth wobbles relative to the fixed position of an immovable Sun

Sirius & Precession

It is recognized that from the beginning of the empire and during the entire dynastic period the rising of Sirius with the Sun always occurred around the time of the Summer solstice. Unless the ancient astronomers had some still unexplained means (like an underground hollow from which special shafts opened towards the horizon in certain directions) to directly observe Sirius in conjunction with the Sun, it is extraordinarily hard, if not impossible, to observe Sirius in broad daylight. And during several months before and after it enters in conjunction with the Sun, Sirius is no longer visible at night. Therefore, given the difficulty to locate the Summer solstice and the exact position of Sirius relative to the Sun by naked-eye observations, it is a truly remarkable accomplishment of the ancient astronomers to "choose" from among all of the precessing stars this particular star Sirius as the important and lasting marker for time.

The implication of this astronomical fact is best explained by Jed Z. Buchwald, a distinguished Professor of History and Science, in his paper "Egyptian Stars under Paris Skies" ***(Caltech, Engineering & Science No. 4, 2003)***, where he discusses the meaning of the Zodiac that has been engraved in the ceiling of the temple of Dendera in Egypt:

"The solstice is, after all, extraordinarily hard to pin-point by observation, and in any case it was known from Greek texts that the Egyptians were particularly concerned with the heliacal rising of the brightest star in the sky, Sirius—that is, with the night when Sirius first appears, just before dawn. In Egyptian prehistory this event certainly preceded the annual flooding of the Nile, which was of obvious agricultural importance. Would not precession have moved Sirius along with the zodiacal stars, eventually decoupling its heliacal rising from the solstice, and so from the annual inundation? We know today that the inundation occurs after the June beginning of the rainy season in Ethiopia, where the Blue Nile rises. And yet Sirius' heliacal rising remained a central marker of the year throughout Egyptian history." (p 25)

".... despite precession, Sirius and the solstice must remain about the same distance in time from one another during most of Egyptian history. Indeed they do, though it's doubtful that Burckhardt and Coraboeuf had thought it through. Because of Sirius' position, and the latitudes at which the Egyptians observed the sky, both Sirius' heliacal rising and the summer solstice remained nearly the same number of days apart throughout Egyptian history even though the zodiac moves slowly around the ecliptic." (pp 29)

Buchwald, who produced a revealing diagram on the 'Heliacal Risings of Sirius' in relation to the vernal points (for the period of 2900 BCE to 2941 CE at intervals of 1460 years) using TheSky software, makes it very clear that ***"Sirius remains about the same distance from the equinoxes - and so from the solstices - throughout these many centuries, despite precession".***

In a personal correspondence with this author, Jed Buchwald also noted that *"the effect was actually first discovered long ago by Tycho Brahe in fact, who informed the chronologer Scaliger about it."*

Buchwald's account appears to be very different from the established notion that the phenomenon of the 'Precession of the Equinox' was not known to the ancient Egyptians - a notion which the astronomer Johann Karl Burckhardt and the engineer Jean-Baptiste Coraboeuf of the early 18th century were not at all convinced of.

Earlier on, as we can learn from Buchwald, Charles Dupuis argued that astronomy itself was born near the Nile over 14000 years ago. And Constantin Francois Chasseboeuf (a.k.a. Volney) maintained that history amounts to a succession of continually reemerging ancient civilizations.

Again, this idea is supported by the Yuga theory of ancient India, as expounded by Swami Sri Yukteswar in the introduction of his book "The Holy Science" which he wrote in 1894. In fact, Sri Yukteswar advanced the argument by asserting that the celestial phenomenon which causes the backward movement of the equinoctial points around the zodiac is due to the motion of our entire solar system around its dual.

Yet the assertion that Sirius plays the role of a center for the circuit of our entire solar system has been proposed about six decades later by the mathematician and Egyptologist R.A. Schwaller de Lubicz, who studied the findings of Jean-Baptiste Biot. De Lubicz remarked in his book "Sacred Science - The King of Pharaonic Theocracy" that the Sirius year of almost exactly 365.25 days was established according to the heliacal rising of Sirius.

"For it is remarkable that owing to the precession of the equinoxes, on the one hand, and the movement of Sirius on the other, the position of the sun with respect to Sirius is displaced in the same direction, almost exactly to the same extent."

R.A. Schwaller de Lubicz, "Sacred Science", Inner Traditions (1982)

Using The Position of Sirius - Better Than Precessional Dating?

1. In an attempt to "re-date" dynastic Egyptian chronology or better said, to assign more accurate periods to the reigns of Kings and Pharaohs, astronomers and Egyptologists have recently combined their efforts in order to use the heliacal rising of Sirius as a "source of dating". A special software program has been developed by Karine Gadré, the Associate Researcher at the Department of Astrophysics of the Midi-Pyrenees Observatory in Toulouse, France.

The original program which determines the heliacal rising for any star taking in account the date, latitude, elevation and a number of atmospheric variables is available from her company called CultureDiff (**www.culturediff.org**). The software works mainly on the basis of historical references and demonstrates that Sirius neither follows a tropical year of 365.2422 days nor a sidereal year of 365.2564 days. Evidently, the length of a Sirian year is almost exactly 365.25 days according to the program.

Example: Given the same atmospheric conditions for Alexandria (latitude 31,22 degrees), the heliacal rising of Sirius occurs in 1950 CE on August 5 and in 3421 BCE on July 19 (Julian Calendar) [which is equivalent to June 21, 3420 BCE Gregorian calendar]. Hence, in some 5370 years Sirius has moved approximately 45 days away from the Summer solstice in 3420 BCE. Of course, over the same period the stars of the Zodiac would have moved by roughly 75 days due to the effects of precession.

Like with other available astronomical software, the apparent motion of the stars is programmed for the slow retrograde movement with respect to the fixed position of the equinox or solstice in the calendar (i.e. the rate of precession is not based on Hipparchus' or Ptolemy's figure or for that matter on an Egyptian agricultural year of 365 days, but on a more modern value of 50.26" per tropical year).

According to the current theory of *lunisolar precession* the pole, and therefore the equator of the Earth is supposed to "wobble" over a period of roughly 25800 years relative to the position of the fixed stars and the Sun. In other words, if we were to imagine the Earth 'fixed' in its revolution around the Sun at the time when Sirius is in conjunction with the Sun (e.g. during the Summer solstice), an observer would not only notice changes in the declination of Sirius and the other stars, but simultaneously equal changes in the declination of the Sun. In practice, however, Sirius does not show any significant variations in its position relative to the Summer solstice.

In order to account for the unusual motion of Sirius, which is minimal relative to the Summer solstice and exceptionally high with respect to the stars of the Zodiac, Karine Gadré offers the following explanation:

"The low change in the celestial coordinates of Sirius comes from its high proper movement, which partly compensated the effects of precession under the Dynastic Period. […] In order to better understand how the proper movement of Sirius can partly compensate the effects of precession, do not only take into account the numerical values of the speed vector. Take also into account the position of Sirius on the celestial vault at a given instant and the direction of the speed vector."

Now we know that the proper motion of Sirius (i.e. of the Sirius system) over a period of some 5400 years is less than 2°:

"For a long time astronomers had been noticing anomalies in Sirius' proper motion; this motion, well known since Halley's time is equal to 0.0375" in RA (Right Ascension) and to 1.207" in D, (Declination), which gives a yearly resultant motion of 1.32" in the direction of 204°, which is noticeably to the south. In 1834, Bessel showed that the anomalies consisted mainly of deviations between the star's theoretical position and its actual position; these distinctly periodic differences, especially in right ascension, may be as great as 0.321", which is a considerable amount with regard to meridian observations. Overall, instead of moving through space in a straight line, Sirius appears to display a wavy trajectory."

Dr. P. Blaize, Le Compagnon de Sirius, Bull. de la Société astronomique de France (1931)

Modern astronomical references indicate that the proper motion of Sirius ranges from RA: -0.038 to -0.553 arcsec/a, whereas values for the Declination are given anywhere from 0 to -1.205 arsec/a.

Such data hardly "compensates" for a precession in the longitude of more than 50" per year!

In terms of sidereal transit time measurement, the mean sidereal rotation period of the Earth with respect to the fixed stars is said to be about 86164.101 seconds, whereas the *mean sidereal day* relative to the position of the vernal equinox is 86164.09054 seconds. According to the "historical data" of Sirius based on observations of its heliacal rising, it appears that a sidereal day, as measured with respect to Sirius (i.e. its mean transit period), is approximately 86164.095 seconds.

A similar value of the mean transit period of Sirius (86164.09281 s), which in reality is closer to a tropical day of 86164.091 seconds, has been confirmed by Karl-Heinz Homann as part of his long-term observations of Sirius during a period of more than six years from 1994 to 2000. His **observations of Sirius** began in 1989 and continue to the present day, furthermore confirming the astronomical fact that Sirius does not show any precession. The minimal motion of Sirius relative to the Summer solstice, for example, cannot be explained by conventional luni-solar precession dynamics, general precession variations or the geometric relationship between the precession cycle and the declination of a star.

In other words, if Sirius is not our Sun's dual it would have to behave like any other star and its mean transit period could not be equal or close to equinoctial time.

Over a period of six years Sirius should have changed its position by 6 × 1223 seconds (i.e. more than 2 hours), which is said to be the time difference between the tropical year and the moment our Earth crosses the imaginary conjunction line between Sun and Sirius. However, the observations have shown that after six years of continued measurement Sirius crossed the meridian only 5 seconds later than tropical time, instead of 9.12 ms/day or 3.34 s annually (6 × 3.34 s = approx. 20 seconds).

According to the latest VLBI data (*International Earth Rotation Service*) and the current astronomical understanding of *precession* (i.e. lunisolar "wobble"), the conventional duration of Earth's inertial spin period is 86164.09890369732 seconds regardless of *precession*.

http://hpiers.obspm.fr/eop-pc/models/constants.html#rotation

If that assumption were to be true, the mean transit period of Sirius can *not* be several milliseconds shorter in duration each sidereal day, than Earth's mean rotation period relative to inertial space!

1. The Sun Behind The Sun

A Special Day In Egypt's Remote Past

Richard Parker provides us with some information on the meaning of the first day of the first month (Thoth) of the Sothic year, called wp rnpt or later prt Spdt. By citing various classical sources, he suggests that *"the primary meaning of wp rnpt was the helical rising of Sothis"*, and believes that from the Middle Kingdom on it meant the first day of the 365-day civil calendar.

"It cannot, I believe, be sheer coincidence that the Middle Kingdom was the time when the term prt Spdt first appeared and when wp rnpt came to mean the first day of the civil year. The explanation is to be found, as I can see it, in the transfer of wp rnpt from its original special application. As "Opener of the Year" it would mean the heliacal rising of Sothis, assuming a lunar year based on Sothis. Thus, as a specific day, it did control, or open, the lunar year. When, however, the civil year had been developed, there came a time, the Middle Kingdom by all the evidence, when the first day of that year, the day which literally "opened" it, also came to be called wp rnpt. Here the emphasis was on the day itself, not on any astronomical event which took place on it. Since by then the civil year had supplanted the lunar year in the life of the people, wp rnpt as the rising of Sothis was of interest mainly to the priests and the temples, and another term, prt Spdt, "the going-forth of Sothis", purely descriptive of the event, was adopted to name the feat in the civil calendar." ...."Wp rnpt was the rising of Sothis, the event which opened the new year but which, in itself, did not form part of it."

R. Parker, "The Calendars of Ancient Egypt", Studies in Ancient Oriental Civilization, No.26 (1950)

Variants of that name include meanings like "The going-forth of Horus", "the birth of Re", "the coming forth into Day" and even "the day of the creation of the universe".

"According to Porphyry (de antro nympharum 24), 'for the Egyptians the beginning of the year is not Aquarius, as for the Romans, but Cancer. For near Cancer is Sothis, which the Greeks call the dog-star. Their new moon is the rising of Sothis, which is the beginning of generation in the world'; and Solinus (Polyhistor 32. 12-13) states that 'this time (the rising of Sirius) the priests have decided to be the birthday of the world, that is the time between the 13th and 11th day before the Kalends of August (July 20 –22).' "*

* [around July 4th Gregorian]

R. Parker, "The Calendars of Ancient Egypt", Studies in Ancient Oriental Civilization, No.26 (1950)

In the "Decree of Canopus" (238 BCE) we can still find a subtle reference to the ancient tradition: *"On the day of the going-forth of Sothis, called wp rnpt in name in the writings of the House of Life."*

The Same Day Nowadays

For the purpose of accurately dating the entire period of Dynastic Egypt, astronomers and Egyptologist rely primarily on three recordings of the presumed 'heliacal rising of Sirius', which according to some astronomers required many successive observations but *no* calculations:

"The oldest of the three recordings of the heliacal rising of Sirius in terms of civil dates is based on an entry from a temple register from El-Lâhûn":

"Year 7 [of the reign of Sesostris ?], [Month] III [of Season] Peret, Day 25 ... The Prince and Overseer of the Temple Nebkaure has said to the Chief Lector Priest Pepyhotep : "You should know that the Going Forth (i.e., the heliacal rising) of Sothis takes place on [Month] IV [of Season] Peret, Day 16... You might wish to inform (?) the lay-priests of the Temple of the city called "Mighty is Sesostris the Justified" and [of the Temple] of Anubis and of [that of] the Crocodile-god... And let this letter be produced for the announcement-board of the temple."

Karine Gadré, CultureDiff, Dossier on "The heliacal rising of Sirius: a source of dating", chapter "The heliacal rising of Sirius under the reign of Sesostris? (1/3)"

Obviously, this ancient text (*as well as others according to Schwaller de Lubicz*) **makes reference to the "Going Forth" of Sothis, confirming that such a specific day was calculated and announced in advance** (*even for different temples regardless of terrestrial latitudes*) **rather than an observer waiting for the actual astronomical event to take place in relation to the annual flooding.**

Egyptologists are more concerned as to when and where some king “Sesostris” I, II or III reigned. As long as the date found on a papyrus from some temple matches with the particular ruler of the given period, the otherwise irrefutable chronology of Egypt’s dynastic decline reflected by a continuous "monarchy replacement" remains intact for future generations to memorize.

Astronomers, however, using the method of back-dating cannot afford to be so vague about astronomical dates. If they wish to take into account the chronological divergences of centuries on the basis of a 365.25 day interval of the heliacal rising of Sirius and claim* that the [Month] IV [of season] Peret, Day 16 somehow corresponds to either June 29th 1800 BCE or August 18th 2000 BCE, then we need to ask why there is a difference of 50 days in just 200 years?

* *“In 2000 BC, IV Peret 16 coincided with August, the 18th; in 1800 BC, with June, the 29th.” (*K. Gadré, “The heliacal rising of Sirius: a source of dating”*)*

Of course, by going back in time and converting these dates to our modern civil calendar we arrive at June 14th and August 1st respectively. According to Neugebauer's suppositions regarding ancient Egyptian astronomy, the priests based their reckoning of time on the irregular flooding of the Nile and an agricultural year of exactly 365 days. Thus we are led to believe that the day provided by the ancient text (the 16th day of the eights month of the year) could corresponded to any possible day in a 365-day calendar with respect to the Summer solstice, or the more easily observable equinoxes. That is the reason for the above noted 50 day difference in 200 years (200 × the missing ¼ day every four years).

But do we really want to assume that the ancient Egyptian priests failed to realize that around 2000 BCE their own calendar date was off by nearly three weeks with respect to the solstice and more importantly with respect to the predicted heliacal rising of Sirius?

Hipparchus and Ptolemy relied on imprecise drawings of stars in the sky, an inaccurate tropical year and only a few years of personal observations, but the ancient Egyptians, who successively observed Sirius and other stars for several thousands of years, had supposedly no clue that these stars in relation to the position of Sirius, and their calendar in relation to the Summer solstice or the seasons, would have drifted noticeably apart in a period of already less than a hundred years.
It almost sounds as if *Mother Nature* never offered the people of Egypt (unlike the Mayan) any other signs and means besides an irregular inundation of the Nile and variable lunar months to correct the calendaric situation.

Who can really say whether the enlightened *Hermetic* priests at Dendera, Heliopolis and other temples across Egypt would have felt pressed at all to express themselves in alignment with any ceremonial "state" calendar?

Knowledge of a systematic motion of Sirius in the celestial sphere and in relation to the seasons can only be the result of profound wisdom and/or many centuries of careful observations carried out with mathematical exactitude.

Let's not forget that the ancestors of the ancient Egyptians solved quadratic equations in order to construct the Great Pyramid; a design that is based beyond any reasonable doubt on the harmonic Phi-relation, given the mathematical fact that the surface area of each face of the pyramid is **exactly** equal to the square of its height.

Conclusion

Nowadays, Earth's aphelion is on or around July 4th, which is also the time when Sun and Sirius are in conjunction. For the ancient priests the day of the "Going Forth" or "Shining Forth" of Sirius represented the day of the "New Year", and therefore the beginning of the calendar marked by the position of Sirius relative to the Sun.

So when astronomers assert that the "Going Forth" of Sirius took place shortly after the time of the Summer solstice (i.e. projected backwards to around July 18th to 20th Julian or July 2nd to 4th Gregorian), then we must seriously question the assumption that the astronomically precise Sirius or Sothic year would be equal to a Julian year of 365.25 days.

It would be much more reasonable to conclude that the length of a sidereal year as measured with respect to Sirius is nearly identical to the equinoctial or tropical year of our Earth.

As a final thought, we would like to leave the reader with a wise observation by one of India's greatest sages, **Swami Sri Yukteswar**, for it takes vision and courage to clearly see and rectify our mistakes.

"...we may observe that the different planets, exercising their influence over the various days of the week, have lent their names to their respective days; similarly, the different constellations of stars, having influence over various months, have lent their names to the Hindu months. Each of the great Yugas has much influence over the time covered by it; hence, in designating the years it is desirable that such terms should indicate to which Yuga they belong.
As the Yugas are calculated from the position of the equinox, the method of numbering the years in reference to their respective Yuga is based on scientific principle; its use will obviate much inconvenience which has arisen in the past owing to association of the various eras with persons of eminence rather than with celestial phenomena of the fixed stars."

Swami Sri Yukteswar, "The Holy Science", 1894

In that sense, and in the tradition of the hermetic wisdom of an ancient and pre-dynastic Egypt, may the "Truth Come Forth Into Day"!