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<u>The Coptic Calendar</u>

1. Introduction:

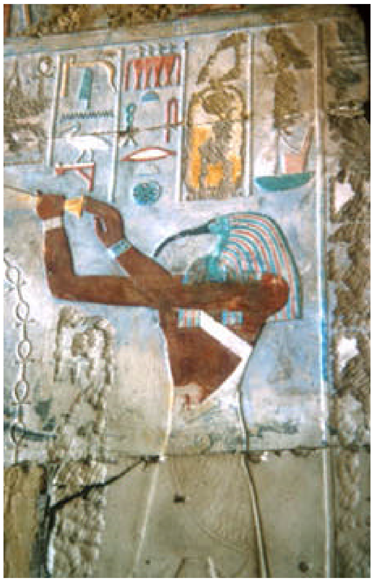
The Coptic Orthodox Church's liturgical life is directed by its own calendar, and the Church has remained conservative to the present day with its dating of the fasts and feasts in accordance with this calendar.

Many people notice and comment particularly on two feasts that are divergent from the modern (Western) Gregorian calendar, and these are Christmas and Easter. Still, on the basis of when Easter is celebrated during the year, the rest of the moveable days of the fasts and feasts of the Church are set (such as Feast of Pentecost and the Fast of the Apostles, for example).

In this article, we will find out more about the calendar of the Coptic Orthodox Church, and learn about how and why it differs from the Gregorian calendar that is in use in the modern world. This will help in understanding why there are different dates for Christmas. Also, this article will explain the method of finding the date of Easter in the Coptic Church, which is known as the computus.

2. The Ancient Egyptian Civil Calendar:

The ancient Egyptians contributed much to our modern ways of determining time. They were among the first to divide the day into 24 hours, consisting of 12 equal parts of daylight and 12 equal parts of night.[1]



They were also among the first civilization to make use of a civil calendar that is quite close to the modern tropical year. The creation of the Egyptian civil calendar, which was probably used for administrative purposes, was ascribed to the god Toth (Fig. 2.1).

There is much debate about the origins of the Egyptian civil calendar. The earliest calendars may have relied on the cycle of the seasons and the lunar cycles (the monthly cycle of the moon). In fact, the majority of ancient civilizations relied on a lunar calendar, which may be measured by the synodic year or the sidereal year.

Fig. 2.1 The god Toth

The synodic year consisted of twelve months of an average of 29 1/2 days each, based on the cycle of the moon, whereas the sidereal year consisted of twelve months of an average of 27 1/3 days each, based on the time it took the moon to orbit around the stars.[2] The Egyptian calendar may have been inspired by the lunar calendar, since it had months, and inspired by the seasonal cycles, which took some 365 days.[3] This way the calendar ran parallel to the solar year, but it was not a solar calendar – the evidence for this was that the Egyptian calendar had no leap years, and as such the civil year moved one day every four years behind a solar calendar. In all cases, in the third millennium B.C., the Egyptian civil calendar became independent of the moon and the sun: "Whereas Egypt's main calendar was linked neither to sun nor moon, those of other cultures usually heeded both."[4]

The Egyptian civil year was divided into three seasons that centered on the agricultural value of the river Nile in ancient Egyptian society (indeed, as Herodotus noted, Egypt is the "gift of the Nile"). Each of the three seasons was divided into four equal months of thirty days, with the addition of the "little month" of five days (called "*epagomenoi*" by the Greeks). This gives a total of 365 days in the civil year.[5] Originally, the months were

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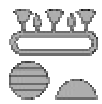
[1] Bennett, Jeffrey, et al., *The Cosmic Perspective*, (San Francisco, CA: Pearson Education, 2004), p. 59.
[2] Ibid., p. 88.
[3] Depuydt, Leo, *Civil Calendar and Lunar Calendar in Ancient Egypt*, (Leuven, Belgium: Peters Publishers & Department of Oriental Studies, 1997), p. 49.
[4] Ibid., p. 18.
[5] Cf. Bomhard, Anne-Sophie von, *The Egyptian Calendar: A Work for Eternity*, (London: Periplus, 1999), p. 10.

named according to the division into four parts of the three seasons; later, perhaps during the New Kingdom, civil months were individually named with theophoric names, but there is much scholarly debate concerning the hieroglyphic sources.[6] In the Aramaic, Greek and Coptic sources of the theophoric names of the civil months, there is more homogeneity.[7] The following are the division of the seasons, followed by the Aramaic, Greek and Coptic names for each month[8] (the names in brackets are in the modern Bohairic dialect),[9] followed by the possible meaning of the names:[10]

The Season of the Inundation – Akhet

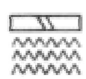


First Akhet – Thoth (Thoout): named after Toth, the god of wisdom, science, and art.
Second Akhet – Phaopi (Paope): named after Hapee, the god of the Nile and vegetation.
Third Akhet – Hathyr (Hathor): named after Hathor (Hwt-Hwr), the goddess of beauty.
Fourth Akhet – Choiak (Kiahk): named after Ka-Ha-Ka, the Apis sacred bull.

The Season of the Emergence – Proyet

First Proyet – Tybi (Tobe): named after Amso Khem, the god of the growth of nature.
Second Proyet – Mecheir (Meshir): named after Meshir, the god of the wind.
Third Proyet – Phamenoth (Paremhotep): named after the god Montu, the god of war.
Fourth Proyet – Pharmouthi (Parmoute): named after Renno, the god of severe wind.

The Season of Harvesting – Shomu



First Shomu – Pachons (Pashons): named after Khenti, the god of the moon.
Second Shomu – Payons (Paone): named after Oni, the god of metals.
Third Shomu – Epeiph (Epep): named after Apida, the great serpent killed by Horus.
Fourth Shomu – Mesore (Mesore): named after Maswt-Ra, the birth of the Ra, the sun.

Kouji nabot (little month): each of the five days commemorated the birth of Osiris, Horus, Seth, Isis and Nephthys.

[6] Depuydt, Leo, *Civil Calendar and Lunar Calendar in Ancient Egypt*, (Leuven, Belgium: Peters Publishers & Department of Oriental Studies, 1997), p. 109.
[7] Ibid., p. 57.
[8] Ibid., p. 58.
[9] From Bishop Youssef and Bishop Serapion, *The Divine Liturgies of Saints Basil, Gregory and Cyril*, (Diocese of the Southern U.S., 2001), p. vi.
[10] Adapted from Demetrius, H.G. Bishop, *An Idea on the Calendar and the Abakty Computus*, (Malawi, Egypt: Metropolis of Malawi Publishing, 2000), p. 21. There are various assumptions of the interpretations of the names, but these are the most common and probable.

Perhaps by the end of the Old Kingdom, the Egyptians made use of “decans” to indicate time, particularly at night (this would be before the invention of water clocks). A decan is a star (or stars) that indicated an hour for 10 consecutive days.[11] Some of the earliest charts of these decans are found in the coffins of the First Intermediate Period, and by the New Kingdom, they adorned the ceilings of the kings’ tombs (Fig. 2.2-4). Each decan had a name that marked each of the 12 hours at night.[12] From these charts, we find that:

1) The Egyptians divided the day into 12 hours in the morning and 12 hours at night.
2) They marked a decan for each hour at night.
3) They saw 36 decans (see images below).
4) If each of the 36 decans were seen for 10 days, the year could be separated into 36 periods of 10 days (hence the name “decans”), which gives a total of 360 days in the year (the *epagomenoi* days were added to these to complete the year).[13]
5) Each month was divided into three sets of 10, giving a total of 30 days per month, and 120 days per season (hence the independence from the lunar calendar).[14]

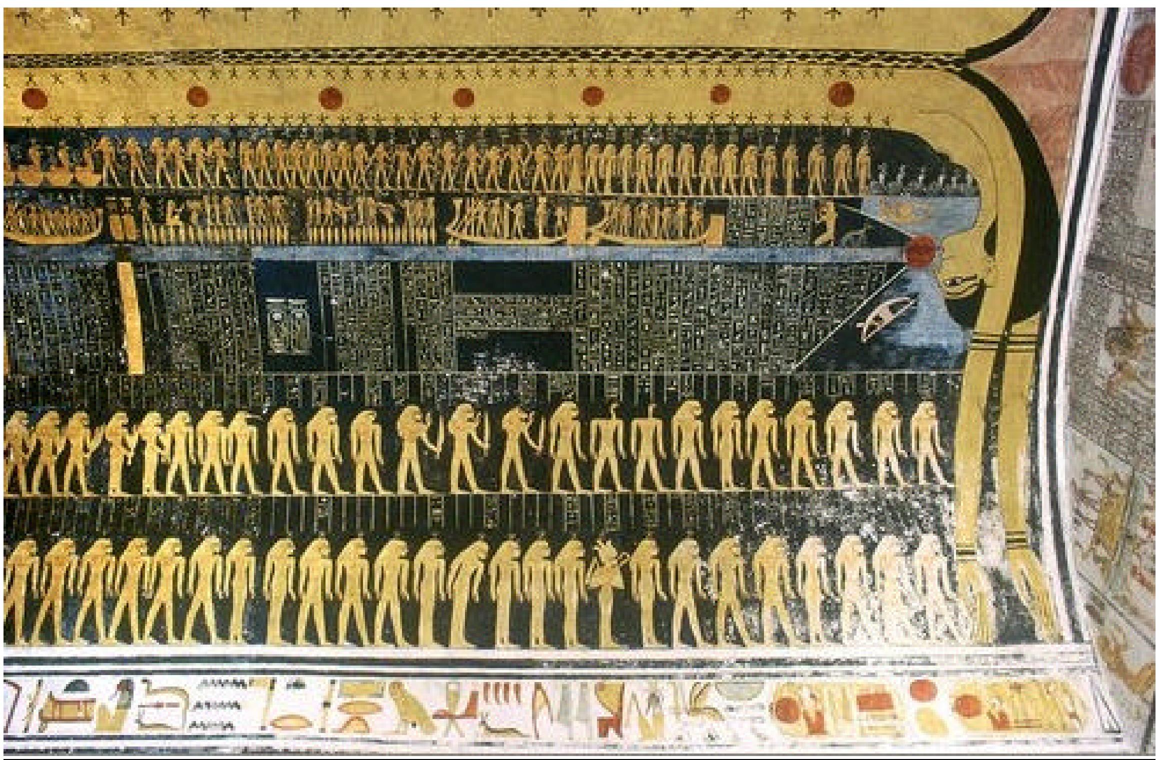


Fig. 2.2 Decans in the ceiling of the tomb of Ramses VI

[11] Bomhard, Anne-Sophie von, *The Egyptian Calendar: A Work for Eternity*, (London: Periplus, 1999), p. 54.
[12] Ibid., p. 56.
[13] Ibid. p. 51.
[14] Ibid., p. 63.

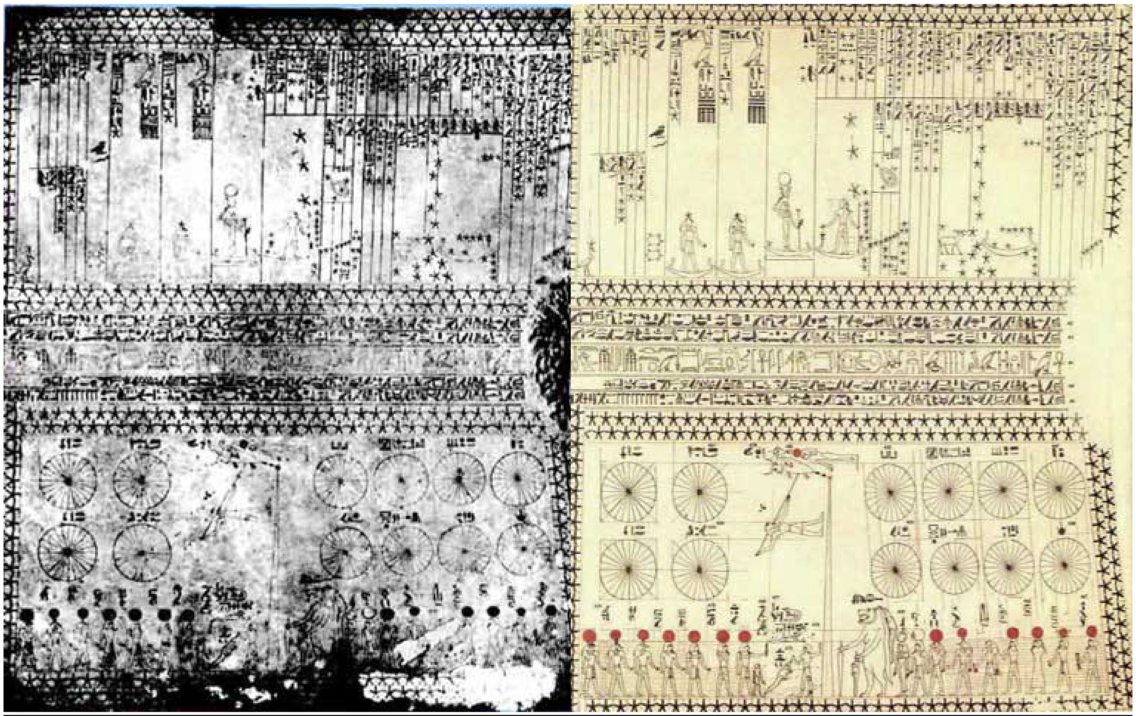


Fig. 2.3 Decans in the tomb of Senmut (the picture on the right is an artist's reconstruction)

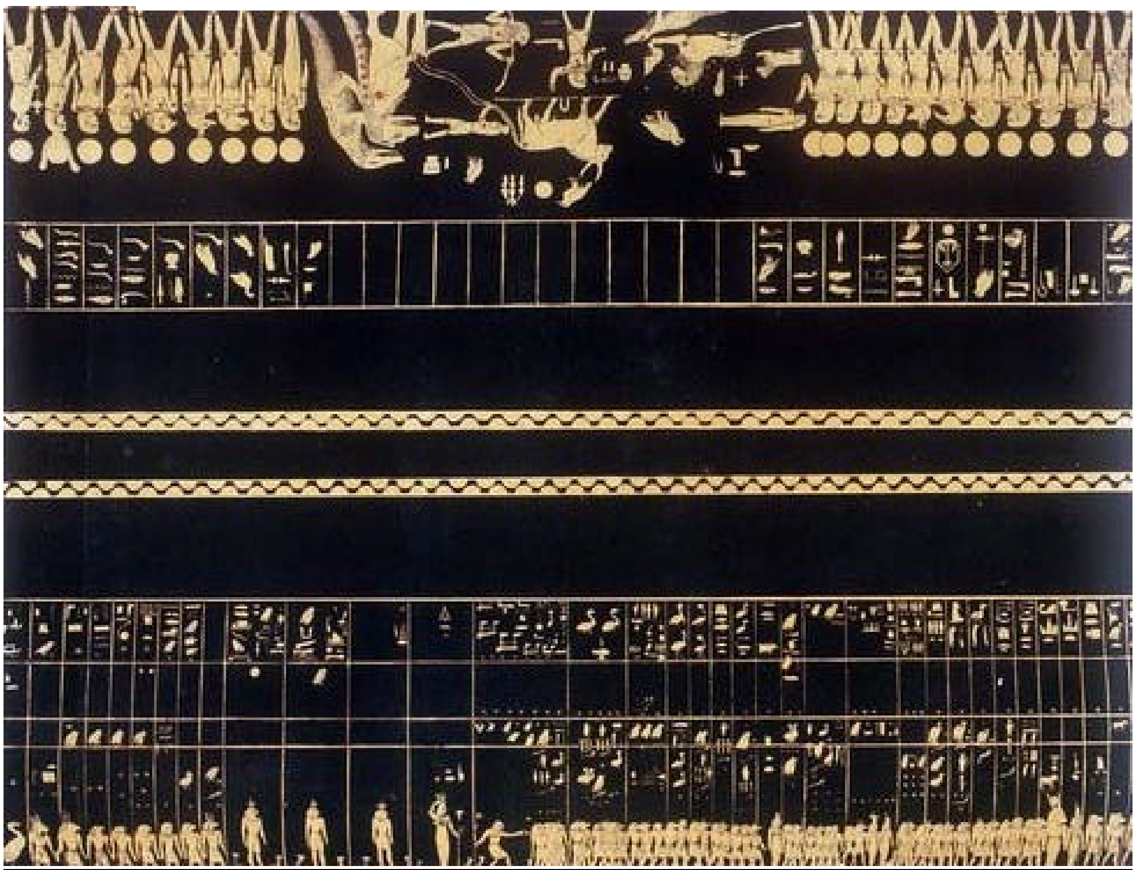


Fig. 2.4 Decans on the ceiling of the tomb of Seti I

3. The Ancient Egyptian Sothic Calendar:

Along with the civil calendar, the Egyptians used another calendar based on the heliacal rising of the star Sirius (the "dog star"), which happened to coincide with rising of the river Nile.[15] The goddess Sopdet was the personification of this star, and the Egyptians depicted her as a seated cow with a plant between her horns, and sometimes as a woman with a star poised on her head.[16] The image below (Fig. 3.1) depicts her with both a plant and a star poised on her head.

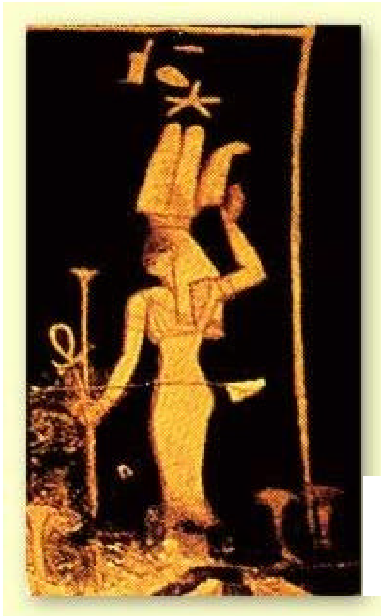


Fig. 3.1 The goddess Sopdet, from the ceiling of the tomb of Seti I

The plant was also used as an ideogram for "year," so the Egyptians may have correlated the rising of Sirius with the beginning of the year – in fact, in the Decree of Canopus, the rising of Sirius is identified as: "'the opener of the year' in the writings of the House of Life" in hieroglyphic; "'the beginning of the year' in the writings of the House of Life" in Demotic; and "considered to be the new year by the sacred writings" in Greek.[17]

In the duration of the history of ancient Egypt, the heliacal rising of Sirius occurred on an average of 365.25 days – a figure quite close to the tropical solar year (365.2422 days).[18] The civil year of 365 days was noticed to wander out of the seasons by one day in every four Sothic years (the same is true in the solar year, as mentioned above). For this reason, the civil year was termed the "mobile" or "vague" year. In time, the Egyptians figured that the date of the rise of Sirius in the civil year is the same as the date 1460 years earlier – this is known as the Sothic period.

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[15] Depuydt, Leo, *Civil Calendar and Lunar Calendar in Ancient Egypt*, (Leuven, Belgium: Peters Publishers & Department of Oriental Studies, 1997), p. 14.
[16] Shaw, Ian, *The Oxford History of Ancient Egypt*, (Oxford: Oxford University Press, 2000), p. 10.
[17] Depuydt, Leo, *Civil Calendar and Lunar Calendar in Ancient Egypt*, (Leuven, Belgium: Peters Publishers & Department of Oriental Studies, 1997), p. 14.
[18] Bomhard, Anne-Sophie von, *The Egyptian Calendar: A Work for Eternity*, (London: Periplus, 1999), p. 28.

4. The Alexandrian Calendar and the Julian Calendar:

Fig. 4.1 Coin with the image of Ptolemy III

The Ptolemaic Dynasty of the third century B.C. was the period when Alexandria became the powerful capital of Egypt and ruled by Hellenists. In his ninth year of rule (239 B.C.), Ptolemy III Euergetes I (Fig. 4.1) made a decree, known as the Decree of Canopus, to include the concept of the leap year in an attempt to synchronize the Egyptian civil calendar with the Sothic year:

"… in order to have the seasons follow an absolute rule, that the days of certain solemn feasts to celebrate in winter should never fall into summer because of the displacement of the rise of Sothis by one day every 4 years, and so that other feasts among those now celebrated in summer shall not be celebrated in winter in times to come, as has already happened and will happen again… henceforth, a day shall be added… every fourth year to the five *epagomenoi* before the New Year."[19]

The Egyptian priests, however, did not accept the decree. In 46 B.C., the Roman Emperor Julius Caesar, with the consultation of the Alexandrian astronomer Sosigenes, introduced the Egyptian civil calendar with the leap year (as decreed by Ptolemy III) to Rome. This calendar became known as the Julian calendar, which consisted of 365 days in a year and added a leap day in the month of February every four years, giving an average of 365.25 days in the year. It was only during the reign of the Roman Emperor Augustus in 25 B.C. that the Egyptians officially reformed their civil calendar. The New Year was always the first day of the month of Thoout, which was the day of the helical rise of Sirius (as mentioned in the Decree of Canopus), but in the year of the reform the first of Thoout in the Egyptian civil calendar was 41 days after the rise of Sirius. Thus, in the Alexandrian calendar the New Year came 41 days after the rise of Sirius – that is, 12 Paope in the Sothic calendar became 1 Thoout in the Alexandrian calendar. This also affected the Julian calendar: July 19 in the Julian calendar was the rise of Sirius and 1 Thoout in the Sothic calendar, but now July 19 is 25 Epip.[20]

That was the form of the Egyptian civil calendar before the dawn of Christianity. Years later, the last cruel persecutor of Christians was the Roman Emperor Diocletian, and so his era became known as the Era of the Martyrs, which was reckoned from Diocletian's ascension to the emperorship of Rome on 29 August (in the Julian calendar) or 1 Thoout (in the Alexandrian calendar) of the year 1037 A.U.C. or 284 A.D.[21] The Coptic Christians, then, continued using the Alexandrian calendar, and considered the Era of the Martyrs (A.M.) as the first year in their calendar (that is, 1037 A.U.C. = 284 A.D. = 1 A.M.). This feature is what became the Coptic calendar.

[19] Ibid., p. 29.
[20] Ibid, p. 91.
[21] Teres, Gustav, *The Bible and Astronomy: The Magi and the Star in the Gospel*, (Budapest, Hungary: Springer Orvosi Kiado Kft., 2000), p, 215.

5. The Gregorian Calendar:

Even though the Egyptian civil calendar was reformed to the Julian calendar and the Alexandrian calendar to synchronize the seasons, by the sixteenth century A.D. they were both found inaccurate. In the days of the reformation of the civil calendar, it was not known that the tropical year is actually 11 minutes short of 365.25 days. Originally, the spring equinox fell around March 25 in the Julian calendar, but the difference in minutes added up through the years such that by the sixteenth century the spring equinox fell on March 11.[22] In 1582, Pope Gregory XIII (Fig. 5.1) decreed a reformed calendar, the Gregorian calendar, which is still in use in the West in modern times.

Fig. 5.1 Pope Gregory XIII of Rome

First, the pope chose March 21 to be the date of the spring equinox, on the basis of the fact that in the year 325 A.D., the year of the First Ecumenical Council at Nicea, the spring equinox was on March 21. Secondly, he decreed that the day following October 4, 1582 would be October 15, 1582, where the ten-day difference would push the spring equinox in 1583 forward from March 11 to March 21. Finally, the pope made an exception to the rule of having a leap year every four years:

On the turn of a century, the year that is not divisible by 400 is *not* a leap year – for example, the year 1900 is not divisible by 400, so it was not a leap year, but the year 2000 is divisible by 400, so it was a leap year. All these changes ensure that the average length of the Gregorian calendar year is almost exactly the same as the length of the tropical year.[23]

[22] Bennett, Jeffrey, et al., *The Cosmic Perspective*, (San Francisco, CA: Pearson Education, 2004), p. 93.
[23] Ibid., p. 93.

6. The Gregorian Calendar and the Date of Christmas:

Since the fourth century, the Egyptians celebrated the feast of the Nativity of Jesus Christ on Kiahk 29, which coincided with December 25 in the Julian calendar. Interestingly, this is 9 months exactly after March 25, the spring equinox of the Julian calendar, which shows that the spring equinox allegorically pointed to the Incarnation of the True Light, Jesus Christ.

Nevertheless, with the introduction of the Gregorian calendar, Kiahk 29 (Julian Dec. 25) moved to coincide with January 4 (ten days later) on the Gregorian calendar. Then, with every turn of the century that is not divisible by 400, there is an additional day of the leap year – that is, add 3 days at the turn of the past 3 centuries since the introduction of the Gregorian calendar (1700, 1800, 1900, but not the year 2000, which is divisible by 400 and is a leap year), and the result is that Kiahk 29 coincides with January 7 in the Gregorian calendar. This difference of thirteen days (addition of ten days and three leap days) explains the reason why there is a difference in the days of celebrating Christmas.

7. The Easter Computus:

So far, we have proceeded chronologically from the Ancient Egyptian civil calendar to the reform of the Gregorian calendar in the West that produced a difference in celebrating Christmas when compared to the Julian and Coptic calendars. Now we will move back to the first centuries of Coptic Christianity to find how they calculated the date for Easter Sunday.

It has been mentioned above that many ancient civilizations relied on a lunar calendar. Each complete cycle from one new moon to the next new moon takes either 29 or 30 days (or an average of 29.5 days), so a 12-month lunar calendar has either 354 or 355 days, and this is around 11 days less than the solar calendar days (365 days). The excess days in the solar year over the lunar year is called an epact. In fact, one may notice that in the Islamic calendar, which is a lunar calendar, the month of Ramadan wanders through the Gregorian year by 11 days in each successive year.

The ancient Babylonians were among the first to synchronize the lunar calendar with the solar calendar, but the credit was given to the Greek astronomer Meton by Western society. In 432 B.C., Meton discovered that if in every 19 solar years (= 6939.75 days) there would be 235 lunar months (= 6939.55 days), the same lunar phases come on approximately the same dates. This cycle of 19 years is known as the Metonic cycle. In order to synchronize the lunar calendar with a solar calendar, it should have 235 months every 19 years. Since 19 lunar years is 228 months, the Metonic cycle is made possible by adding a thirteenth month to any 7 years of every set of 19 years, which results in exactly 235 months in each 19-year period. This ensures that in every 19 years a specific season or feast would come on the same date.[24] The Jewish calendar, unlike the Islamic calendar, adds this thirteenth month (called an "embolismic month") in the third, sixth, eighth, eleventh, fourteenth, seventeenth, and nineteenth year of each cycle. This

[24] Ibid., pp. 61, 62.

synchronized calendar used by the Jews is sometimes called a lunisolar calendar, to identify it from a purely lunar calendar as the one used in Islam.[25]

Before the First Ecumenical Council at Nicea in 325 A.D., there were Christians (called the Quartodecimans) who celebrated Easter on the day of the Jewish Passover (14 Nissan and the season of the harvest, as in Lev. 23) regardless of the day of the week; whereas other Christians celebrated on the Sunday following the Jewish Passover feast. Eventually, the Council decided to unite all the Christians, and declared that Easter was to be celebrated on the first Sunday after fourteen days from the New Moon that occurs after the vernal equinox.[26] Fourteen days after the New Moon is not necessarily a full moon, so it is correct to call this the "Paschal Moon" rather than the "Paschal *Full* Moon."[27]

Most scholars agree that the Council of Nicea approved the Alexandrian method of the computus, which is attributed by the Coptic Church to Pope Demetrius of Alexandria, to find the date of Easter with the help of the Metonic cycle.[28] The Alexandrian computus allows Easter to occur on the Sunday following the Jewish Passover (that is, after the Paschal Moon), following the spring equinox (March 21 in the Julian calendar), and also does not allow Easter to occur before March 22 or after April 25 in the Julian calendar. In the Gregorian calendar, the Julian spring equinox translates to April 3 (Coptic Paremhotep 25), so both the Passover and Easter cannot occur before the first week of Gregorian April or after the first week of Gregorian May.

The Alexandrian computus takes into consideration the epacts, so adding embolismic months in the following way synchronized the lunar calendar:[29]

The first solar year has an excess of 11 days.
The second solar year has an excess of 11 + 11= 22 days.
The third solar year has an excess of 22 + 11 = 33 days.

The third lunar year takes 30 days from the above 33 days, and it becomes an embolismic month, and the remaining 3 days are added to the following year (the fourth year):

The fourth solar year has an excess of 3 + 11 = 14 days.
The fifth solar year has an excess of 14 + 11 = 25 days.

The fifth lunar year has an embolismic month by adding to it 5 days, which are to be taken from the following lunar year (the sixth year):

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[25] Ibid., p. 61.
[26] Teres, Gustav, *The Bible and Astronomy: The Magi and the Star in the Gospel*, (Budapest, Hungary: Springer Orvosi Kiado Kft., 2000), p. 215.
[27] Ibid., p. 216.
[28] Ibid., p. 215.
[29] Mikhail, Deacon Albair Gamal, *The Essentials in the Deacon's Service*, (Shobra, Egypt: Shikolani, 2002), pp. 1144, 1145.

The sixth solar year has an excess of 11 – 5 = 6 days.
The seventh solar year has an excess of 6 + 11 = 17 days.
The eighth solar year has an excess of 17 + 11 = 28 days.

The eighth lunar year has an embolismic month by adding to it 2 days, which are to be taken from the following lunar year (the ninth year):

The ninth solar year has an excess of 11 – 2 = 9 days.
The tenth solar year has an excess of 9 + 11 = 20 days.
The eleventh solar year has an excess of 20 + 11 = 31 days.

The eleventh lunar year has an embolismic month by removing one day from the eleventh year and adding it to the following lunar year (the twelfth year):

The twelfth solar year has an excess of 1 + 11 = 12 days.
The thirteenth solar year has an excess of 12 + 11 = 23 days.
The fourteenth solar year has an excess of 23 + 11 = 34 days.

The fourteenth lunar year has an embolismic month by removing 4 days from the fourteenth year and adding them to the following lunar year (the fifteenth year):

The fifteenth solar year has an excess of 4 +11 = 15 days.
The sixteenth solar year has an excess of 15 + 11 = 26 days.

The sixteenth lunar year has an embolismic month by adding to it 4 days, which are to be taken from the following year (the seventeenth year):

The seventeenth solar year has an excess of 11 – 4 = 7 days.
The eighteenth solar year has an excess of 7 + 11 = 18 days.
The nineteenth solar year has an excess of 18 + 11 = 29 days.

The nineteenth lunar year becomes an embolismic month by it having only 29 days. The whole cycle is then repeated, and on that basis the date of Easter is determined.

Note that the addition of the embolismic month in the lunar years above does not follow the Jewish calendar; the Alexandrian computus differs in that the fifth and sixteenth lunar years have embolismic months, unlike the Jewish calendar that adds them to the sixth and seventeenth lunar years.

Now, the third lunar year has the first embolismic month, so this marks the first year when the Metonic cycle is applied. So, the third lunar year becomes the first Metonic cycle year – this is also known as the Golden Number. The following table shows a list of the years of the Metonic cycle (the Golden Number), a list of the epacts for each year, the observed Coptic date and the observed Julian date for the 14th day after the New Moon (14 Nissan) after the Julian vernal equinox (Julian March 21). The translation of the

Coptic and Julian dates to the modern Gregorian date (add 13 days to the Julian date) is given in the end for convenience:

Metonic Cycle Year	Epacts	Coptic Date	Julian Date	Gregorian equivalent
1	3	Parmoute 7	April 2	April 15
2	14	Paremhotep 26	March 22	April 4
3	25	Parmoute 15	April 10	April 23
4	6	Parmoute 4	March 30	April 12
5	17	Parmoute 23	April 18	May 1
6	28	Parmoute 12	April 7	April 20
7	9	Parmoute 1	March 27	April 9
8	20	Parmoute 20	April 15	April 28
9	1	Parmoute 9	April 4	April 17
10	12	Paremhotep 28	March 24	April 6
11	23	Parmoute 17	April 12	April 25
12	4	Parmoute 6	April 1	April 14
13	15	Paremhotep 25	March 21	April 3
14	26	Paremhotep 14	April 9	April 22
15	7	Parmoute 3	March 29	April 11
16	18	Parmoute 22	April 17	April 30
17	none	Parmoute 10	April 5	April 18
18	11	Paremhotep 29	March 25	April 7
19	22	Parmoute 18	April 13	April 26

8. How to Find the Easter Date Using the Table:

Using the Coptic year (A.M.), you can find the epact of the year using the formula:

$$\{[(Y-1) \bmod 19]X11\} \bmod 30$$

E.g. For the Coptic year 1723 A.M., the epacts will be:

1723 - 1 = 1722
1722 mod 19 = 12
12 X 11 = 132
132 mod 30 = 12
Therefore, the epacts = 12 days
From the table, the Paschal Moon is on: Paremhotep 28

Or you can find the Metonic cycle year using the formula:

$$(Y - 3) \bmod 19$$

E.g. For the Coptic year 1723 A.M., the Metonic cycle year is:

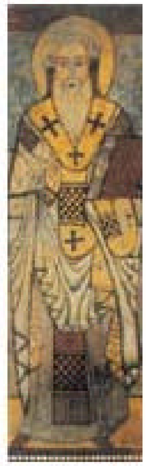
1723-3 = 1720
1720 mod 19 = 10
Therefore, the Metonic cycle year = 10
From the table, the Paschal Moon is on: Paremhotep 28.

So far, we have only attempted to chart the dates of the Paschal Moon. Recall that Easter should be on the Sunday after this Paschal Moon. One of the ways of finding the weekday of the Paschal Moon was to make a list of all the dates in a year and write beside each one of the dates a number that corresponds to the day of the week. These numbers were called "concurrents" or "solar epacts", and were later used by Rome for the Julian calendar – they used the letters of the alphabet, and called them the "Dominical Letters." The concurrents are:

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Usually, the earliest lists of the weekdays for each date throughout the year will center on a year in which the spring equinox (Paremhotep 25) or the New Year (Thoout 1) was a Sunday. The date moves one weekday ahead the following year, or two weekdays if the following year was after a leap year. For example, Paremhotep 25 was on a Sunday in the year 1721 A.M. In the year 1722, it comes on a Monday. In the year 1723, it comes on a Tuesday, and so on.

So, in the example used so far, in the year 1723, the Paschal Moon falls on Paremhotep 28, which is three days after the spring equinox in the Coptic calendar (Paremhotep 25). That means that the Paschal Moon will come three weekdays after Tuesday, that is, Friday. The Sunday right after that is Easter Sunday – this will be Paremhotep 30, 1723 A.M.



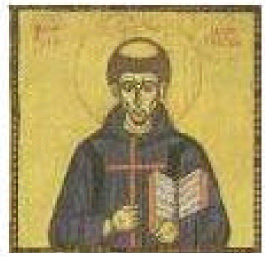


Fig. 8.1 Icon of St. Cyril of Alexandria, from the Monastery of St. Antony, Egypt (left), and Dionysis Exiguus (right)

In the sixth century, Dionysius Exiguus (Fig. 8.1) used method of the Easter computus of the Coptic calendar and applied it to Julian Calendar. In his work,[30] he used the list of the Metonic cycles done by St. Cyril of Alexandria (see image above, left), which spanned the years from 153 A.M. to 247 A.M. However, Dionysius attempted to designate time from what he calculated to be the year of the birth of Christ (1 A.D.) – he was, in fact, the first to create the Era of the Incarnation, or the Anno Domini. He extended the list of St. Cyril to include another 95 years (that is, five 19-year cycles), and included new methods of finding the date of Easter in the Julian calendar.[31] It was his method that was in use in the Chalcedonian Orthodox churches as well as Rome, until the Gregorian calendar was introduced.

9. Conclusion:

In modern times, it may be the case that the Coptic Church relies on dating Easter using the Era of the Incarnation, with the support of the method proposed by Dionysius Exiguus for the Julian calendar. However, this is only for the convenience of people in the modern age who rely on the modern calendar and dating using the Era of the Incarnation. This article, though, was on the Coptic Calendar and how it was used before the conveniences of the modern age – that even includes some easy algorithms to use to find the date of Easter and the even easier means of using a computer!

Thus, we have seen the development of the Egyptian Calendar from its beginnings as a calendar that came out of observations of the moon and the seasons based on the Nile River's inundation, to its final form preserved in the Coptic Church. We have also seen why a difference arose between the Western and Eastern calendars, which resulted from the reforms by Pope Gregory XIII, and how the Coptic Church calculated the date for Easter. May the Lord who was Incarnate, was born, suffered and raised from the dead make this work a source of knowledge and blessing for our glorious Church. Amen.

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[30] The list and calculations are available online: http://hbar.phys.msu.su/gorm/chrono/paschata.htm

[31] Teres, Gustav, *The Bible and Astronomy: The Magi and the Star in the Gospel*, (Budapest, Hungary: Springer Orvosi Kiado Kft., 2000), p. 215.

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