

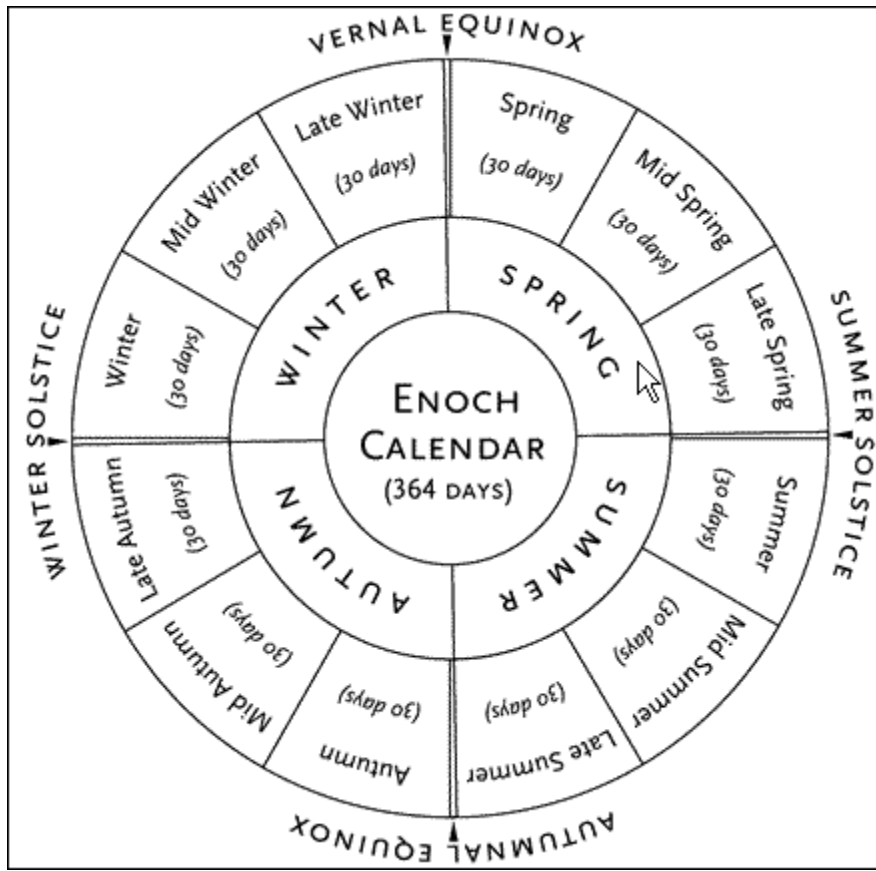
# The Ethiopic Calendar - Dr. Aberra Molla

<https://tseday.wordpress.com/2008/09/14/ethiopian-calendar/>

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Ethiopia has its own ancient calendar. According to the beliefs of the Ethiopian Orthodox Church, God created the world 5500 years before the birth of Christ and it is 1994 years since Jesus was born. Based on this timeline, we are in the year 7494 of the eighth millennium (or smnTow vh). These are referred to as Amete Alem (JMT JLM) in Amharic or "the years of the world". Era of the world dates from 5493 B.C.

Ethiopic is not the only calendar in Ethiopia either. The works of Enoch (hnk) had been in Ethiopia and Egypt before the times of Moses and on through the times of King Solomon and Queen of Sheba. As has been the case for Israel, Egypt and Ethiopia have had important roles in Biblical History. An Enochian year is completed in 364 days, Enoch 82:4-7 and Jubilees 6:23-28. More precisely, a 365-day-solar-year and the 365-year-solar-cycle appear as a 365-days-and-years single term. From the three books of Enoch, a curious 364-day length of calendar year lends new insight by reserving the last day of the solar year. Ethiopians followed the Old Testament before the introduction of Christianity (1 Kings 10:1-9). The Arc of the Covenant was brought to Ethiopia long before Christianity accepted the Old Testament and offered worship to God. The Oromo people have their own calendar. Bete Israel (bT asrjl) believe in the Jewish faith.



The Ethiopic Enochian Calendar had 364 days per year. The Book of Enoch, whose Ethiopic version in its entirety survived only in Ethiopia and was taken to Europe by James Bruce was publicized around 1790 A.D. The Book of Enoch has been part of the Ethiopian Bible and Enoch 28:11 mentions the completion of the year in 364 days. (In view of the Ethiopian Orthodox, Enoch wrote his Ethiopic Bible as the first and oldest author in any human language.)

The earliest known date is 4236 B.C.E., the founding of the Egyptian calendar. The ancient Egyptian calendar was lunar. The solar Coptic (ግብጽ) calendar, oldest in history, originated three millennia before the birth of Christ. The exact date of its Egyptian origin is unknown. It is believed that Imhotep, the supreme official of King Djoser C.2670 B.C. had a great impact on the construction of the calendar. Historically, ancient Egyptians initially used a civil calendar based on a solar year that consisted of 365 days only, without making any adjustment for the additional quarter of a day each year. Each year had 12 months. The heliacal rising of Sirius coincides with the arrival of the highest point of river Nile flood at Memphis marking the first day of the year. The new year of the ancient Egyptians started on Meskerem 1 (መስከረም ፩). This date is an Ethiopian new year signaling the end of Noah's flood. (The Hebrew new years also start in Meskerem. The Egyptian solar calendar consisted of 12 30-day months with five extra festival days at the end of the year. It should be noted that the chronology of 3,000 years

of Ancient Egyptian history, by modern Egyptologists, was made possible only because the Ancient Egyptians followed the Sothic Year of slightly over  $365\frac{1}{4}$  days, i.e. 365.25636 days.)

The connection between Egypt and Ethiopia from at least as early as the Twenty-second Dynasty was very intimate and occasionally the two countries were under the same ruler, so that the arts and civilization of the one naturally found their way into the other.

The Ethiopian Calendar has more in common with the Coptic Egyptian Calendar. The Ethiopic and Coptic calendars have 13 months, 12 of 30 days each and an intercalary month at the end of the year of 5 or 6 days depending whether the year is a leap year or not. The year starts on 11 September in the Gregorian Calendar (G.C.) or on the 12th in (Gregorian) Leap Years. The Coptic Leap Year follows the same rules as the Gregorian so that the extra month always has 6 days in a Gregorian Leap Year.

Following his conquest of Egypt, Julius Caesar consulted the Alexandrian astronomer Sosigenes about calendar reform. The calendar that Julius Caesar adopted in the Roman year 709 A.U.C. (Ab Urbe Condita, i.e. since the founding of Rome or 46 B.C.) was identical to the Alexandrian Aristarchus' calendar of 239 B.C., and consisted of a solar year of twelve months and of 365 days with an extra day every fourth year. This calendar that replaced the Roman calendar became the Julian calendar. The lunar Roman calendar had only ten months with December (the Latin decem for ten) as the tenth month until January and February were inserted. Quintilis, the fifth month, was changed to July in honor of Julius Caesar and Sextilis was renamed August for Augustus Caesar.

When the Roman papal chancellor, Bonifacius, asked a monk by the name of Dionysius Exiguus to implement the rules from the Nicaean Council for general use and to prepare calculations of the dates of Easter, Dionysius fixed Jesus' birth in such a manner that it falls on 25 December 753 A.U.C., thus making the current era start with A.D. 1 on 1 January 754 A.U.C. It was about 525 A.D. that Dionysius Exiguus, started his count (instead of the Diocletian of 284 A.D.) with the year 1 A.D., considered to be the year of the birth of Christ. It is likely that Jesus was actually born around 7 B.C. or before King Herod's death in 750 A.U.C.

The Venerable Bede wrote the history of the early centuries of England in 731 A.D. He adopted the system of Dionysius and its use spread. Unfortunately, Bede made a blunder when he invented the B.C. system and stuck it immediately before A.D. 1. A year and a day were lost because of this error and the controversy on the start of new millennium has even run into 2000 G.C. though 2001 is assumed to be the new beginning. The Julian Calendar was modified to the Gregorian calendar in 1582 A.D. Pope Gregory authorized that ten days be excised from October 5 through October 14 in

the year 1582. Christians celebrated Easter on the same date, using the algorithm from A.D. 325 until 1582. In 1583 G.C. Joseph Scaliger introduced the Julian day and began counting time from 4713 B.C. taking it day by day. In 1740 G.C. Jacques Cassini used +1 to designate A.D. 1 so that +1 is preceded by year 0, which is preceded by year -1.

In the Gregorian Calendar, the tropical year is approximated as  $365+97/400$  days = 365.2425 days. Thus it takes approximately 3300 years for the tropical year to shift one day with respect to the Gregorian calendar. The approximation  $365+97/400$  is achieved by having 97 leap years every 400 years. Some claim that the Gregorian calendar took care of the extra 11 minutes and 14 seconds of the tropical solar year with 365.242199 days instead of the 365.25 days. Yet, in the Eastern Orthodox system a century year is a leap year only if division of the century number by 900 leaves a remainder of 200 or 600 with  $365+218/900$  days = 365.242222 days, which is certainly more accurate than the official Gregorian number of 365.2425 days. Furthermore, due to the gravitational dynamics of the Sun-Earth-Moon system the length of the tropical year is not constant. In the Ethiopian calendar leap years come every four years. The Julian year is equal in length to the Coptic or Ethiopic year. In the Gregorian calendar every year that is exactly divisible by 4 is a leap year, except for years that are exactly divisible by 100; these centurial years are leap years only if they are exactly divisible by 400. In other word, Ethiopic has 100 Leap years every 400 years while Gregorian has 97.

(With the proper intercalation the Ethiopic Enochian calendar can be made more accurate. For instance an intercalation of a year every 293 years (107016 days) gives 365.2423 days, a fraction very close to the real time of 365.2422 days (20926 divided by 86000 seconds equals 0.2422 of a day). An unexpected feature of the 364-day year of Enoch is that it results in an average year length even more accurate than the modern Gregorian calendar. The actual length of the year is now 365.2422 days. The Gregorian calendar averages 365.2425 days. But if 52 weeks are intercalated every 293 years into the calendar of Enoch, then it averages 365.2423 days which is extremely accurate. It is very surprising that such accuracy can be obtained by intercalating an entire week at a time over so short a time period. In contrast, the Gregorian calendar intercalates one day at a time over a 400-year cycle and achieves less long-term accuracy.)

The Ethiopic calendar differs from both the Coptic and the Julian calendars. The current 1994 Ethiopian Calendar (E.C.) year is equivalent to the 1718 Coptic Calendar (C.C.), the 2001 Julian Calendar (J.C.) and the 2001 Gregorian Calendar (G.C.) years. After the massive killing by the Romans that was so severe and traumatic the Egyptians began a new calendar called "The Martyr's Calendar" in A.D. 284. The difference between the Ethiopic and Coptic is 276 years. In spite of this, the Ethiopic Calendar is closely associated with the rules and the different calculations influenced by the Coptic Church and the Ethiopian Orthodox Tewahido Church. (According to Aymro and Motovu, the Calendar of the Ethiopian Church came from Egypt and as to methods and dates agrees with the Calendar of the Coptic Church. But the two calendars differ with regards to

the saints' days and the time of observing them.) According to Ethiopian scholars such as Aleqa Kidane Wold Kiflie (አለቃ ኪዳነ ወልድ ክፍለ), the Ethiopic Calendar A.D. differs from other Christian calendars because of the continuity to these years after completion of the 5500 years and the former is religious while the latter is based on history. The Ethiopic years are seven years behind the Western and Eastern Church calendars. The seven years difference by Meskerem 1 becomes eight on January 1. Ethiopic uses the 5500 E.B.C. years in proleptic as well as modern calendrical calculations.

According to Asrat Gebre Mariam and Gebre Hiwot Mehari, the Romans endorsed an inaccurate figure by the time they started from counting the birth year of Jesus Christ. Exiguus suggested that the Romans (drop the A.U.C. calendar and) start with the Christian Calendar in 532 A.M. (and 19 lunar cycles times 28 solar cycles equals 532). Many churches accepted the A.D. 1 (or 753 A.U.C.) calculation of Exiguus, which was off by four years, only because of the difficulty associated with changing calendar rules and regulations established on it. The authors point out to evidence presented by Flavius Josephus and other which include Matthew 2:1. Also Tiberius Caesar became the king of Rome in the Roman 765 year and Jesus started teaching fifteen years into his reign, at the age of thirty, in 780 A.U.C.- see Luke 3:1-23.

The starting point of the Jewish calendar is 3761 B.C., the date for the creation of the world according to their religion. The Aztecs believed that the creation of the world occurred 3113 B.C. The Greek epoch correlates to 776 B.C.E. Olympiad. The Islamic Calendar started from A.D. 622 after the flight of Mohammed to Medina.

The Geez Calendar (QLnts) is divided into old and new. The old era which is equivalent to the B.C. is Zemene Bluy (Z.B.) or (ZMN bly). Zemene Haddis (Z.H.) or (ZMN 'ds) is Anno Domini (A.D.), though it is commonly referred to as Amete Mihret (A.M.) which means "years of mercy". Amete Mihret (JMT m'Rt) is abbreviated as J!m! Coptic Years are Amete Semaetat (JMT Sm]tt or J!S!). The Gregorian Calendar years are followed by anD awr[ a(uUr, which means according to the "European" calendar and is abbreviated as a!a! In Amharic Julius is ylys, Gregory is grgrys and B.C. is Kkrsts Bft (k!B!). The current Ethiopic year can be written as 19094 J!m!, 1994 A.M., 1994 Z.H., 7494 A.A. and even 1994 J!m!

The Ethiopians, like all their contemporaries, probably did not know about the zero between the B.C. and the A.D. years. In spite of this, 5500 + Amete Mihret years divided by 4 is an Ethiopic Leap year if the remainder is 3. Leap (>gr) years by the Ethiopian Calendar are those that end in a Gregorian calendar year preceding a Gregorian calendar leap year. The Ethiopic Leap day is Phagumien 6 ([gmn 6).

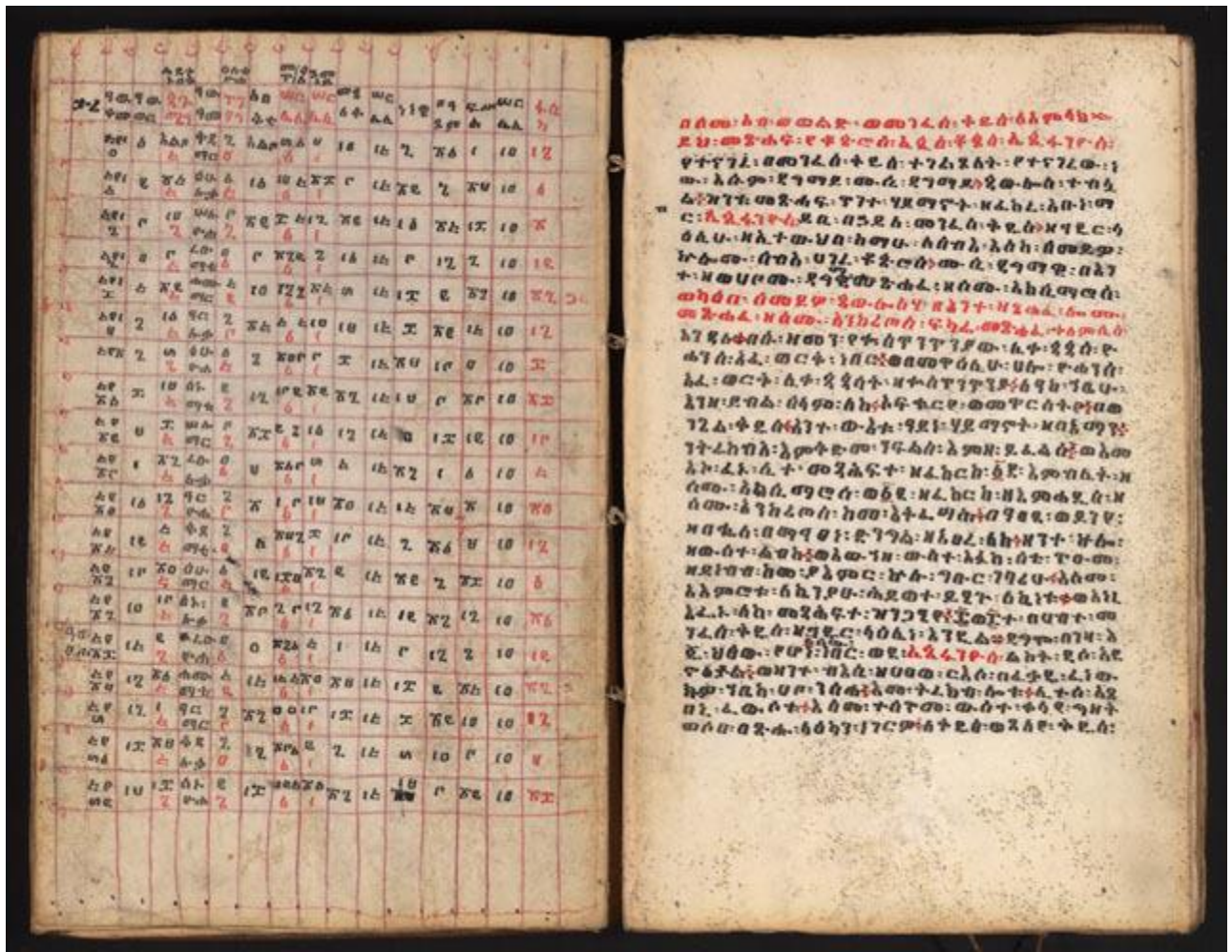
Calendar raises the issue of the types of counting glyphs used for documentation. The ancient people might have used the "Aebegede" (ABGD) digits. The numerals of the HeleHEME (HL" M) Ethiopic are not alphabetic (fDlw a;z) to Ethiopic. Some Ethiopians

claim that the resemblance of most Ethiopic numbers to the Greek or Coptic numerals do not necessarily mean they were copied from them. Recent research shows that the Greek alphabetic numerals were borrowed from the Egyptian Demotic system. The modern Ethiopian calendar is tabulated with Ethiopic and Latin alphanumeric characters to make it bi-alphabetic and includes the G.C. dates. Many incorporate national, Christian and Muslim holidays. (The week tables start with Sundays.) It has continued to play important roles in agriculture, genealogy, astronomy, history, astrology, commerce, science, etc. and in calculating movable holidays such as Ethiopian Easter. Many other movable Christian holidays change with the Easter (that also uses the Hebrew Calendar).

Ethiopian calendar tables are usually annual, though one spans 532 years. The calendar cycles repeat and thus the charts are re-usable. Dr. Getatchew has published examples and describes how the 532-year cycle table with the movable holidays (B]lt) and fast (aiwmt) days was created for the first time by Annianus (anyns), an Egyptian monk, who lived around 400 A.M. The table was for the 12th cycle or years 5853 to 6384 A.A.

Groups of years like those associated with lunar and solar cycles have Amharic names (qemer / QMr^ awde chereka / ]wD XRq^ terefe tsehay / TRF ?'y^ etc.). The Ethiopic years have four-year cycles. The years are named after the evangelists Matthew (mtws), Luke (lqs), Mark (mrqs) and John (y'ns). Each year has four seasons, similar to autumn (fall or ?Dy), winter (kRmt), spring (MIw) and summer (Bg). An Ethiopian week has seven days. Each day has a numeric value for use in calendrical calculations. For instance, Pope Demetrios (ptyrk dmurs) of the Church of Alexandria (seat of St. Mark see) utilized Mitonic cycles, the calculations of Ptolemy and the Egyptian calendar to establish the rules for calculating Easter and the day of a particular new year. Asrat and Gebre Hiwot have published the arithmetic of similar Ethiopic old methods.

Apart from hours, minutes, seconds, etc. Ethiopic also has a time frame known as kekros (kkrs). A kekros is 1/60th of a day. An Ethiopian solar year has 365 days and 15 kekroses while a lunar year has 354 days and 22 kerkoses. (A 1987 E.C. Amharic book by Asrat (].rt) and Gebre Hiwot (GbR 'yWt) is recommended for more information on the calendar or calculations of the holidays in accordance with a book called Bahre Hassab (b'R 'sb). For example, the 1994 A.M. Meskerem 1 day can be calculated by adding 7494 A.A.+1873 and dividing the sum by 7. If the remainder is one it is on a Tuesday. (1873 is 5500 Z.B.+1994 A.M. divided by 4.)



Bahera Haszab - This Ethiopian manuscript, in the languages of Amharic and Geez, is open to a page explaining the mathematical system for fixing the movable feasts and fasts of the Ethiopian Orthodox Church.

One of the reasons behind the controversy between the Ethiopian and the Gregorian calendars is because Pope Gregory abandoned the rules for calculating Easter and introduced new rules in 1582 without consulting the Alexandrian Church. Gregorian also changed the beginning of Julian new years from Mgbt (March) to ur (January) and reduced Leap years. It also involves the minutes that add up to one day (about every 128 years) and the relative positions of these days within the year numbers, while the days have constantly remained the same.

The Ethiopian calendar lacks the historical numerical discontinuity and inflation of the other Christian calendars and may be one of the oldest, even if it is another inaccurate calendar. As a result, it is not affected by the absence of the zero digit and it is

reasonable to conclude that the new millennium will begin on Meskerem 1, 2001 E.C. (MsKRm 1 Qn 2001 J!m!). Considering that all calendars are not really accurate and we continue to worry about leap seconds to improve on them while ignoring years, the reluctance of Ethiopians in accepting the Gregorian calendar is understandable. However, the four years gap introduced by Exiguus does not account for the seven years difference between the Ethiopic and the Christian calendars. If Jesus was born in 7 B.C. and nobody made the effort to correct the error, the A.D. years should have remained the same. The Ethiopians imply that Exiguus used 532 in the wrong year without mentioning the A.D. year, though he was working on his Easter calculations in (the proleptic) A.D. 525. Further research is justified for historical, chronological, computational and other reasons and to find out how the Ethiopians stayed younger in spite of hanging onto the calendar for millennia. The Ethiopian calendar is neither Julian nor Gregorian. (The difference between the Ethiopian and Julian calendars most likely appeared only after Exiguus came up with Anno Domini.) For instance, Ethiopic days could be references. In a new book in Amharic, b'R "sb (Bahra Hassab), Getatchew Haile (gtCw ;yl) used 365.25 days per year starting with Tuesday, Meskerem 1, 5500 years before the birth of Jesus. Nevertheless, if the birth of Christ is a new era for Christians we might as well get ready to celebrate the new millennium with Ethiopians in the year 2001 E.C. on September 11, 2008 G.C.