

SABBATH THOUGHT 2026-04-11—WHY I KEEP THE CALCULATED HEBREW CALENDAR

May God bless you on His Sabbath day!

God established the sun, moon, and stars “for signs and seasons, and for days and years” (Gen. 1:14). These celestial bodies determine the days, months, seasons, and years. All life on this earth is linked to them. The seasons of spring, summer, autumn, and winter determine when plants grow and produce seeds as well as when animals, fish, birds, and insects procreate. Mankind is tied to the life cycle of living things, which follows the solar year.

The rotation of the earth and its orbit around the sun establish two important time factors—the length of a day and a solar year. A third time factor is determined by the orbit of the moon around the earth. Tracking the movements of these celestial bodies is necessary to know when to plant and harvest or when a holyday begins. However, it is impossible to align the days, months, and years without some manipulation. The solar year is 365.24 days (365 days, 5 hours, 48 minutes, and 46 seconds); it is not a whole number of days. This is true also of lunar months. The cycle of the moon from new (dark) to full (fully lit) and back to new again is 29.53 solar days (29 days, 12 hours, 44 minutes, 2.8 seconds). Aligning the sun and moon on a calendar with fractional days requires adjusting the length of a solar year or the number of days in the months or both. This is the only way to synchronize the sun and moon and maintain 24-hour days. These are called luni-solar calendars.

Biblical months begin on new moons that determine dates of the Passover and holydays¹. God “appointed the [*new*] moon for seasons [*mowed* = *includes holydays*].”² The Hebrew word for “new moon” is *chodesh* (H2320) and it is also translated “month.” While there is no biblical description of what constitutes a new moon, there is a consensus of historical literature that the first day of the month is traditionally the first visible Waxing Crescent New Moon that follows the lunar conjunction (fully dark). It generally occurs 24-48 hours after the conjunction although there are rare exceptional sightings only 12-15 hours later. Variations are due to the elongation or angular separation between the sun and moon, the time elapsed from the actual conjunction, the amount of time the moon is visible after sunset (the velocity of the moon varies), observer latitude, atmospheric clarity, and sky brightness. The priests had the responsibility to determine and announce—blow the trumpet on—new moons, full moons, and holydays:

NUMBERS 10:8-10 “**The sons of Aaron, the priests, shall blow the trumpets;** and these shall be to you as an ordinance forever throughout your generations. ... 10

¹ Lev. 23 specifies the month and day for the Passover (v5), Unleavened Bread (v6, 8), Pentecost (vv15-16), Trumpets (v24), Day of Covering (v26), and Tabernacles (vv34-36).

² Ps. 104:19.

“Also in the day of your gladness, **in your appointed feasts, and at the beginning of your months, you shall blow the trumpets** over your burnt offerings and over the sacrifices of your peace offerings; and they shall be a memorial for you before your God: I *am* the LORD your God.”

NUMBERS 29:1 ‘And in the seventh month, on the first *day* of the month, you shall have a holy convocation. You shall do no customary work. For you **it is a day of blowing the trumpets**.

PSALM 81:3 **Blow the trumpet at the time of the New Moon, at the full moon, on our solemn feast day.**

But all that changed with the destruction of the Jerusalem Temple in 70 AD. God still required the Passover and holydays to be observed and kept even though the Temple was gone and the priests and Levites could no longer perform the required sacrifices and trumpet calls for the new moons, full moons, and holydays. When the Romans conquered Jerusalem, they exiled most of the Jews, making it impossible for any remaining priests to communicate important biblical dates throughout the Diaspora. In fact, the lack of consensus for dating the holydays had become a significant controversy in the early centuries. To address this, Hillel II published a calculation-based calendar in 358-359 AD, referred to today as the Hillel Calendar or the Calculated Hebrew Calendar (CHC)³. His calendar allowed those dispersed abroad to observe the Passover and holydays on the same dates. The Hillel Calendar or CHC⁴ has been the calendar authorized and approved by the Jews over the last 1,700 years or so.

Like most luni-solar calendars, the CHC uses a pattern of years where the number of *days* per month and the number *months* in some years varies to synchronize the lunar months with solar years. The CHC is a 19-year (metonic) cycle of twelve ‘common’ years and seven ‘leap’ years. Common years have 353, 354, or 355 days with 12 months whereas leap years have 383, 384, or 385 days with 13 months. Ten of the thirteen months have fixed numbers of days. Months 1, 3, 5, 7, and 11 have 30 days whereas months 2, 4, 6, 10, and 13 have 29 days. The months 8, 9, and 12 are either 29 or 30 days, depending upon when they occur within the 19-year cycle and whether or not it is a leap year.

In the CHC, the number of days in each of the first seven months is fixed, alternating between 29 and 30 days. This is true for all years. The average number of days per month for the first six months is 29.50 days, which is almost exactly the 29.53 days of a lunar cycle (~44 minutes longer). This is important for dating the Passover and holydays. Since all of them occur in the first seven months, knowing when the first day of the month falls for *any* one of the seven months means it is simply a matter of counting the days—forward or backward—to figure out the dates for the Passover and all holydays.

³ For more information, refer to the article [Calculated Hebrew Calendar Fundamentals](#).

⁴ The CHC did not originate with any modern Church of God.

One main difference between the CHC and lunar observation calendars is how the first day of the month is determined. The first day of a month in the CHC aligns with the Dark Moon (lunar conjunction). Lunar observation calendars, on the other hand, use the sighting of the Waxing Crescent New Moon as the first day of the month, which is usually one to two days after the Dark Moon. While tradition prefers the Waxing Crescent New Moon over the Dark Moon, the CHC overcomes a serious limitation of lunar observation calendars—determining the first month Abib when Passover is kept. One way luni-solar calendars align the solar year with lunar months is by adding an additional month to the calendar year every so often. The CHC does this with a 19-year cycle that intersperses twelve common with seven leap years. Lunar observation calendars determine the first month Abib (“green ears”) by noting the appearance of green ears on barley. One historian notes they also assessed the vernal equinox and the blooming of fruit trees.⁵ If green ears are present when the Waxing Crescent New Moon is sighted, that is the first day of the month of Abib. If there are no green ears when the anticipated new moon of Abib is sighted, then a month is added and the next Waxing Crescent New Moon becomes the first month Abib. The sighting of the new moon and the appearance of barley green ears, however, must take place in Jerusalem. And that is the main obstacle for lunar observance calendars after the Temple was destroyed, at least prior to the Internet. Until it became commonplace in the last 20 years or so, the CHC was the only practical calendar.

Today, there is access to several websites in Jerusalem that publish dates for the Passover and holydays based upon lunar observations. It seems reasonable to assume they are all quite capable of accurately sighting the first waxing crescent for the first day of a month as well as noting the appearance of green ears on the barley for the month of Abib. However, dating of the Passover and holydays is not consistent among the various lunar observation calendars. There are many reasons they conflict including variations in the maturation of the barley crops, timing of the spring equinox, etc. I admit I do not understand all the subtleties and complexities.

After the destruction of the Temple, there was no universally accepted calendar outside of Jerusalem. Keeping the Passover and holydays was erratic until Hillel II published the CHC. God’s holydays are called *convocations* and the underlying Hebrew word means *to assemble*—He intended for people to assemble together to keep the Passover and holydays. Hillel II recognized this and the CHC was the only practical solution at the time. Convocations are hugely important to God—the *ekklesia* are one body of Christ and have one fellowship with Him. I have kept the Passover and holydays according to the CHC longer than the modern lunar observance calendars have been available. I suspect this is true for many of the *ekklesia*. Even today, the vast majority of Believers still follow the CHC.

One reason I find it exceedingly difficult to accept a lunar observance calendar because there is no agreement among them. Neither is there a lunar observance calendar that has been authenticated by historical documents or the Jewish

⁵ Rabbi Moshe ben Maimon, *Mishneh Torah, Sanctification of the New Moon*, Book 2.

priesthood. The two main reasons I advocate for the CHC are, 1) dating of the Passover and holydays varies among the different lunar observance calendars, and 2) only the CHC is authorized by a recognized and legitimate Sanhedrin council.

The last point, for me, is of major importance. None of the lunar observation calendars can claim legitimacy linked to the Seat of Moses. The CHC, on the other hand, has the authority of the Sanhedrin behind it. The legal authority for Scripture was only given to the scribes and Pharisees as Jesus acknowledged:

MATTHEW 23:2-3 saying: “The scribes and the Pharisees sit in Moses’ seat. 3 “Therefore whatever [he] [referring to Moses] tells you to observe, that observe and do, but do not do according to their [the scribes and Pharisees] works; for they say, and do not do.

Even though Jesus condemned the scribes and Pharisees for many things, He never questioned or denied their legitimate authority to the seat of Moses. Jesus condemned their works, not their scriptural authority. Paul also recognized their authority:

ROMANS 3:1-2 What advantage then has the Jew, or what is the profit of circumcision? 2 Much in every way! Chiefly because to them were committed the oracles [utterances, beyond what was written] of God.

The Sanhedrin was the ruling authority in matters pertaining to the Law. Traditionally, the Sanhedrin was linked to the 70 elders in the days of Moses. Historically, the Sanhedrin was universally recognized by the time of the Greeks, which was well before the Romans and the days of Jesus Christ. Paul, a Pharisee, was taught by Gamaliel I who was both a Pharisee and a ranking member of the Sanhedrin:

ACTS 22:3 “I [Paul] am indeed a Jew, born in Tarsus of Cilicia, but brought up in this city at the feet of Gamaliel [the elder], taught according to the strictness [exactness] of our fathers’ law, and was zealous toward God as you all are today.

Paul had great respect for Gamaliel I, which is important to acknowledge because Hillel II was one of his descendants:

Hillel I (the Elder)—circa 20 BC

↳ Simon/Simeon ben (“son of”) Hillel

↳ Gamaliel I (the Elder, teacher of Paul)

↳ Simon/Simeon ben (“son of”) Gamliel I

↳ Gamaliel II (of Yavneh)

↳ [Unnamed Son]

↳ Judah ha-Nasi (compiled the Mishnah)

- ↳ Gamaliel III
 - ↳ [Judah Nesiah]
 - ↳ Hillel II (4th century AD)
 - ↳ Gamaliel V
 - ↳ Gamaliel VI (grandson of Gamaliel V, died 425AD)

Hillel II, the seventh from Gamaliel I, was a ranking member of the Sanhedrin when he published the CHC in 358-359 AD. That was the last Sanhedrin due to Roman persecution, which ended shortly after the last president, Gamaliel VI, died in 425 AD. There is no evidence that Hillel II was taught any differently than Paul, at least when it comes to the Law of Moses, which was, in his words, “**according to the strictness [exactness] of our fathers’ law.**” In trying to justify a particular lunar observance calendar, some have questioned the CHC by casting aspersions upon Hillel II and the Sanhedrin; however, there is no reason to believe that Hillel II did not have the same authority to establish the CHC as Ezra had when he changed the Passover sacrifices⁶. The primacy and authority of the Sanhedrin is the reason the Jews continue to rely upon the CHC today.

Some have argued the CHC is not valid because of postponements but the Sanhedrin had full authority to make changes to the calendar. Maimonides, a rabbi who lived from 1135 or 1138 until 1204 AD, was originally named Moshe ben Maimon (aka Rambam) and his many tractates are still influential today. He records in great detail the legal code and authority of the priests and Sanhedrin in his work titled *Mishneh Torah* (“Review of the Torah”). While every historian has its critics especially if their writings do not fit a narrative, the *Mishneh Torah* inarguably asserts that the Sanhedrin had full authority over the calendar in the section titled *Sanctification of the New Moon, Book 2*:

“The sanctification of the new month by contrast, has been entrusted to the [High] court. The new month does not begin until it has been sanctified by the court ...”

Sanhedrin refers to a priestly tribunal. The name originated under the Greeks in 57 BC when tribunals called Sanhedrin were established. Several Lesser Sanhedrin were located in various cities but the Great Sanhedrin was at the Temple. The latter is what Maimonides called the High Court. The authority of the Sanhedrin over the calendar was, according to Maimonides, extremely broad:

“The [High] court has the authority to calculate, institute, and decide which year(s) shall be full *[convert from a common year to a leap year by adding a thirteenth month]* **whenever it desires, even several years in advance.”**

⁶ Ezra 6:19-22.

Maimonides records many situations that prompted the Sanhedrin to change the calendar. They did so to address problems with the sighting or timing of the new moon as well as situations that had nothing to do with lunar observations such as travel obstructions—impassable roads, destroyed bridges, flooded rivers, and broken Paschal ovens. Most of these were solved by delaying the start of the new year by a month; i.e., proclaiming a leap or “full” year. But instituting a leap year is not the same as keeping the Second Passover. A leap year literally delays the first month of Abib by one month, regardless of the barley. Claims that postponements are unique to the CHC or that they invalidate it are not credible—the Sanhedrin had been doing it for centuries before the CHC. It might even be said postponements originated with God when He allowed individuals to delay keeping the Passover to the second month if they are unable to keep it in the first month⁷.

While the Sanhedrin relied upon lunar observations, Maimonides also admits that the Sanhedrin used astronomical calculations when the moon was obstructed, sightings were questionable, or simply to verify the observations of the witnesses:

“The [High] court would make calculations in a manner resembling the calculations of the astronomers, and would know whether the position of the moon - when it would be sighted - would be to the north of the sun, or to its south, if its *crescent* would be wide or narrow, and the direction in which its corners would be pointed ... It is a positive commandment of the Torah **for the [High] court to calculate** and determine whether or not the moon will be sighted.”

Aside from Maimonides, there are other historical sources that establish the authority of the Sanhedrin including Josephus, the Mishnah and Tosefta (Tractate Rosh Hashanah & Sanhedrin), the Cairo Genizah documents, etc. I have not dug into all of them but the main point is that no one denies the fact that the Sanhedrin alone had authority over the calendar for more than 2,000 years! It was the Sanhedrin that sanctified the dates for the Passover and holydays during the life Jesus Christ. The fact that He kept the dates established by the Sanhedrin was an endorsement by God of their authority. Even if the CHC is not a ‘perfect’ calendar, it is the only calendar that has been sanctified by God through the Sanhedrin. There is no lunar observation calendar that received the approval of a priestly authority as evidenced by their differences in dating the Passover and holydays.

But calculations were used for the Jewish calendar for centuries before the CHC. God established the sun, moon, and stars for the purpose of determining seasons, days, and years and they all have predictable patterns that can be expressed mathematically. Abraham was skilled in both math and astronomy, as Josephus (37-100 AD) wrote in chapter 8.2 of *Antiquities of the Jews*:

“... He [Abraham] communicated to them [the Egyptians] arithmetic, and delivered to them the science of astronomy; for before Abram came into Egypt they

⁷ Num. 9:10-13.

were unacquainted with those parts of learning; for that science came from the Chaldeans [*Babylonians*] into Egypt, and from thence to the Greeks also.”

Abraham taught math and astronomy to the Egyptians who then taught the Greeks. While knowledge of math and astronomy are not proof they were used to create a calendar, the mathematics required to calculate one certainly existed as far back as Abraham (circa 2100 BC). While observations were the primary method of dating, there is no question the mathematics existed in ancient times. It is doubtful that Hillel II invented the math behind the CHC, which would have required analyzing a huge amount of observational data. It seems more likely that he borrowed or built upon the mathematical calculations that were used by the Sanhedrin in times past.

The ancients were well versed in astronomy. In 1900 AD, divers found what is called the Antikythera mechanism. It was a Greek invention of Archimedes (287-212 BC) that predicted the movement of the sun, moon, stars, and eclipses. It was ingenious and incredibly precise. It proves the ancients had mastered the astronomy and mathematics for accurate calendars well before the time of Jesus Christ. The Antikythera mechanism was based upon a 19-year metonic cycle calendar just like the CHC.

But the problem of dating the Passover and holydays is not just a modern problem. It would have been an issue when Judah was taken to Babylon around 585 BC. Even if they established the first day of the months by lunar observations, how did they determine the first month of Abib? Did they rely upon locally-grown barley? It is impossible that someone could travel from Israel to Babylon in time to announce the green ears. So, it would not be surprising if they used a calculated calendar. In fact, many of the people of God did not live in or around Jerusalem in the land of Canaan. If they relied upon sightings of the Waxing Crescent New Moon, how did they determine the first month that was aligned with the maturation of the green ears of barley? If it was locally grown, then did the dates for the holydays vary from the ‘true’ Jerusalem calendar simply because the barley matured differently in Turkey, Iran, Iraq, Arabian Peninsula, Israel, etc., all of which were places the people of God lived over the centuries.

Perhaps the best anecdotal evidence that the ancients might have used a calculated calendar is the story of the flood in the Bible. Recall that leap years in the CHC are 383, 384, or 385 days. Those years are much longer than a solar year. The reason for leap years—years with 13 months—is to average out the common years with 353, 354, or 355 days to maintain the 365.24 days in a true solar year. Interestingly, the Noachian flood circa 2350 BC was a leap year. The date of the start of the flood as well as the duration of each stage—rain, prevailing water, abating water—are recorded in the Bible from which it can be determined that the year of the flood was a leap year of 385 days.

The story of the flood begins, “In the six hundredth year of Noah’s life, **in the second month, the seventeenth day of the month**, on that day all the fountains of the great deep were broken up, and the windows of heaven were opened.” (Gen. 7:11) and “the **rain** was on the earth **forty days and forty nights**.” (Gen. 7:12). Verse 24 says that “the **waters**

prevailed on the earth **one hundred and fifty days.**” After the rain stopped, “the waters receded continually from the earth. **At the end of the hundred and fifty days the waters decreased.**” (Gen. 8:3). Finally, “it came to pass in the six hundred and first year [of Noah], **in the first month, the first day of the month,** that **the waters were dried up** from the earth” (Gen. 8:13). The flood record is from the 17th day of the second month to the first day of the first month of the next year. Adding up the numbers shows the year of the flood was 385 days, the same number of days in a CHC leap year:

VERSE	DESCRIPTION	DAYS	NOTES
Gen 7:11	Abib (first month) 1 to Iyar (second Month) 17 when the flood began.	46	Year 600 of Noah. Abib has 30 days plus 16 days into Iyar.
Gen 7:12	40 days and 40 nights of rain.	40	
Gen 7:24	Waters prevailed on the earth.	150	
Gen 8:3	Days waters abated from the earth.	150	Year 601 of Noah, Abib (first month) 1.
Gen 8:13	First day of next year	-1	Abib 1 of the next year is not counted.
	TOTAL	385	

The main purpose of any calendar is so that people can collectively keep the Passover and holydays. A calculated calendar became necessary after the destruction of the Temple and dispersion of the Jews. History documents the confusion that reigned for hundreds of years in the Diaspora as many attempted to keep the Passover and holydays. Hillel II addressed this with the CHC that was sanctified by the last Great Sanhedrin council. It has been in use now for almost 1,700 years. While I do not doubt the sincerity or the methodology behind lunar observance calendars, there are too many variations in the dating of the Passover and holydays and that alone is sufficient to question them. Even if one exists that correctly and consistently sets the dates over the years, it is impossible to prove. But above all, none of them have been sanctified by any priestly body with the authority of the seat of Moses and that is a great concern.

It is a fact that the Bible provides no details for determining the lunar months and solar years. For that reason, I must conclude that **the calendar was, and still is, under the authority of the Jews; specifically, the priests and Sanhedrin whose last sanctified calendar was the CHC in 358-359 AD.** Without the Sanhedrin, there is no Temple priesthood with the authority to determine the holydays. Above all, no one today has the authority to change the existing CHC or establish a new calendar. Therefore, the choice is a personal responsibility.

May God's grace and peace be upon you!

Steven Greene

<https://sabbathreflections.org>
sabbathreflections@gmail.com