# The Calendar of Christ and the Apostles

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## Part I

**October 27, 2002**
***Revised: June 1, 2004***

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# *Preface*

We've all heard the expression, "If it isn't broken, don't fix it!" Applying this simple rule to the Hebrew Calendar could eliminate much confusion.

Some in the churches of God today are convinced that the Hebrew Calendar is defective. They claim that its rules for calculating the feast days of God are not based on Scripture but on Jewish tradition. They are adamantly opposed to the rules of postponement (see Appendix A for complete definitions), which they view as an invention of men. In denouncing these rules, they assert that the "postponement" of the new moon of the seventh month was instituted by the Jews for political or physical convenience.

Is the calculated Hebrew Calendar really "broken," as more and more are beginning to teach? How can we know the truth? If it is possible to show that it is in complete harmony with the astronomical cycles that God has ordained, and that it fulfills every Scriptural requirement for determining His appointed times, the supposed need to modify the calculated calendar will be eliminated. In order to test the validity of the existing calendar, let us examine some basic Scriptural principles that govern all determinations of time.

## *How Are Appointed Times Determined?*

Very early in Scripture, God reveals the elements that He established as the perpetual basis for producing an accurate calendar of all the days in the year, including His holy days. This knowledge is conveyed in Genesis 1:14: "Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days and years."

Notice that God appointed "lights," which are visible signs, to establish days and years and "seasons." This should alert us to the error in using darkness—such as midnight or the conjunction (the dark of the moon)—as a standard for determining the beginning of a day, year, or "season."

The Hebrew word that is translated "seasons" in Genesis 1:14 is *mo'ed* (pronounced *moh-gehd'*), which means "appointed times." This Hebrew

word, first used in the Creation account in Genesis 1, is later used in Numbers 9:1-3 in reference to observing the Passover. The Hebrew word *mo'ed* is also used in Leviticus 23 in reference to all of God's appointed times, or "feasts," including the weekly Sabbath. These and many other Scriptural passages make it clear that the word *mo'ed*--which has been translated into various English expressions, such as "set time," "appointed season," or simply "season"--refers specifically to God's appointed feasts.

When *mo'ed* is translated "seasons," as in Genesis 1:14, it does not refer to climatic seasons, such as summer, fall and winter. In fact, the four seasons--as the world views them today--are not found in the Hebrew text.

The Hebrew text names only two climatic seasons--a period of warming that builds to extreme heat, and a period of cooling that follows. The warm season corresponds to what we call "spring" and "summer," and the cool season corresponds to our "autumn." (The Hebrew term for this season literally means "harvest-time.") These two climatic periods extend from the beginning of the growing season and the ripening of the first harvest of the year, through all the months of planting and harvesting that follow, until the final harvest has been gathered in and the fields have been sown for the first harvest of the new year, which begins to grow but then remains dormant during the cold months. There is no seasonal name in the Hebrew text for the cold months of the year, during which no harvesting takes place.

The climatic terms that are used in the Hebrew text make it clear that the Scriptural view of the seasons is very different from the world's view. The world uses the spring and fall equinoxes* and the summer and winter solstices** to divide the year into four seasons, but the Scriptures do not. The Hebrew text does not divide the warm months of the year into spring and summer, but refers to them as a single climatic season. This season and the following climatic season--the only two that are named in the Hebrew text--extend from the first month through the seventh month of the year. These are the months of planting and harvesting--and the months during which all of God's holy days are celebrated.

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* The **equinox** is the time in the spring and fall when the sun crosses the equator, making the length of day and night equal.

** The **solstice** is the point at which the sun is furthest north of the equator in the summer and is furthest south of the equator in winter.

This Scriptural view of the seasons, which focuses on the harvest cycle, is the basis of the calculated Hebrew Calendar. Unlike the Roman Calendar of this world, which views the climatic seasons as four distinct phases in the solar cycle, the Hebrew Calendar views the climatic seasons as two distinct phases in the harvest cycle. Because the Hebrew Calendar is not based on the Roman view of the seasons, but on the Scriptural view, the calculated Hebrew Calendar places no significance in the equinoxes and solstices of the solar cycle. Although its calculations consistently place the first day of the year *near* the spring equinox, it does not recognize the equinox as a dividing point in time--neither between seasons nor between years.

Some claim that the Hebrew Calendar is defective because it does not consider the equinoxes in its calculations. They insist that the Scriptures support the equinoxes as dividing points in the year. Because they do not understand the Scriptural view of the seasons, they interpret "at the year's end" in Exodus 34:22 as referring to the autumnal equinox. They conclude that the fall equinox MUST occur before the Feast of Tabernacles can begin.

This interpretation of God's command in Exodus 34:22 is based on the Roman view of the seasons. It is clearly exposed as a false assumption by comparing Exodus 34:22 with other Scriptures that use the same Hebrew expression.

When we examine Exodus 34:22 in the Hebrew text, we find that the phrase "the year's end" is translated from the expression *ha shãh-nãh' t koo-phãh'*. The use of this Hebrew expression in other Scriptural passages shows that it does not refer to an *event* in time--such as the equinox--but to a **circuit or cycle** of time. It is used in I Samuel to refer to Hannah's nine-month cycle of pregnancy (obviously Hannah's pregnancy did not encompass all four days of equinox and solstice), and in Psalm 19 to refer to the circuit of the sun across the sky. In Exodus 34:22 it refers to the seven months of the annual harvest cycle. Leviticus 23:39 clearly states that the feast on the 15th day of the seventh month is to be celebrated "when you have gathered in the fruit of the land."

There is no confusion regarding "the year's end" when we understand that the Scriptures divide the year by the harvest cycle--not by the equinoxes and solstices. It is the harvest in the land of Israel that determines the "year's end"--not the fall equinox. The only Scriptural basis for dividing the year is the harvest cycle in the area of Jerusalem. This cycle, which begins in the

first month and ends with the seventh month, is the focus of the Hebrew Calendar.

The harvest cycle in the geographical region of Jerusalem sets the calendar each year for the observance of God's holy days in all parts of the world. Whether we live in the southern hemisphere or the northern hemisphere, we are to observe God's holy days according to this Scriptural standard, regardless of the date of the spring equinox or the climatic seasons in our own geographical area.

A late harvest in the area of Jerusalem is often reflected by a similar climatic pattern in other regions of the world. This is especially true in intercalary years, when a thirteenth month is added to the calendar to realign the months with the climatic seasons. (Remember that the Hebrew Calendar is based on the lunar year, which is approximately eleven days shorter than the solar year. This difference accumulates each year until an additional month is added to correct it.)

Through the practice of intercalation mentioned above, the Hebrew Calendar keeps the months of the year synchronized with their climatic seasons, which ensures that the holy days are observed at their appointed times during the harvest cycle. The rules of intercalation do not remove the holy days from their appointed times, as some are teaching. On the contrary, those who reject the rules of intercalation and limit the calendar year to only twelve lunar months are themselves placing the holy days outside the harvest cycle in some years, which violates the commands of God.

## *"Appointed Times" Committed to Descendants of Abraham*

The commands that we find in Psalm 81 show that the knowledge of when to observe the feasts of God was committed to the descendants of Abraham at the time of their Exodus from Egypt. The book of Exodus records that this knowledge was spoken directly by God to Moses, who delivered it to the elders of the tribes of Israel. God's instructions for His calendar begin in Exodus 12:

"And the Lord spake unto Moses and Aaron in the land of Egypt, saying, 'This month shall be unto you the beginning of months: it shall be the first

month of the year to you' " (Verse 2).

With these words, God began to reveal His divinely ordained calendar for observing His holy days. God Himself set the time of the first month of the holy day year. As Moses' words to the children of Israel reveal, the time that God established as the beginning of the year is "the month Abib" (Ex. 13:4). In commanding that the time of the *abib* be recognized as the first month, God perpetually linked the beginning of the year with the spring harvest cycle.

The Hebrew Calendar has an ancient history that can be traced backward through Scripture to the time of Moses in the 15th century BC. Moses was given divine instructions for a luni-solar calendar that calculated the annual holy day seasons by both the new moons (lunar year) and the harvest seasons (solar year). The first month of the holy day year began in the spring at the time of the barley harvest and was designated as the Abib (meaning "green ears"), as we read in Deuteronomy 16.

Many centuries later, the original name of this month, Abib, was replaced by the Akkadian name Nisan. The Israelites of old adopted the name Nisan, and other Akkadian* names for the months, during the Babylonian captivity. These Akkadian names had been earlier adopted by the Babylonians during the Middle Babylonian Period (1150-1000 BC), some six hundred years before Judah was taken captive. Whether or not we view these names as acceptable, in no way do they alter the calculations of the Hebrew Calendar, nor do they detract from its accuracy.

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* The ancient Akkadians were a Semitic people who ruled the Middle East from the Mediterranean Sea to the Persian Gulf. For the calendric history of this period see article "Historical Evidence of the 19-Year Intercalation Cycle" at our website www.cbcg.org.

## *The Role of the New Moon of the First Month*

Some have rejected the rules of calculation based on the Molad* of Tishri and have chosen to follow their own rules. They claim that the first month should be based on the new moon closest to but not before the spring equinox, and that all the months of the year should be calculated from the new moon of this first month. Some even teach that the day of this new moon was established as a special observance. They have interpreted Deuteronomy 16:1 as a command to observe the new moon of Abib: "Observe the month of Abib [bibha *ãh-veev'*], and keep the passover unto the LORD thy God: for in the month of Abib the LORD thy God brought thee forth out of Egypt by night."

When we examine the Hebrew text, we find that this verse does not support the observance of the new moon of the first month. The word "observe" in this verse is translated from rmv *shãh-mar'* 8104 and expresses the meaning "to celebrate a festival" (Brown Driver Briggs, *Hebrew and English Lexicon of the Old Testament*, p. 1036). This Hebrew verb does not denote visual observation of the new moon of the first month, nor is it a command to keep a festival on the day of the new moon. It is a command to observe the festivals of the month of Abib or Nisan, not the new moon of Nisan.

The new moon of the first month is not a festival, or annual Sabbath, as is the **new** moon of the seventh month (Lev. 23:24-25). The new moon of the seventh month is the only new moon of the year that has been sanctified by God as a holy day. There is no Scriptural basis for observing the new moon of the first month or any other month but Tishri just because the blowing of trumpets sanctified the new moon of each month. Blowing of trumpets at the beginning of each month was similar to blowing the noon whistle—i.e., official notice was given that the new month had begun. Even so, the lengths of each month did not vary. Their lengths were constant and set according to a fixed 30/29 day pattern.

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* A **molad** is the mean or average conjunction of the earth, moon and sun; its mean or average length is 29.53059 days. The molad is not the same as the astronomical conjunction. See *Glossary of Terms* for definition of astronomical conjunction.

Neither is there any Scriptural basis for calculating the other months of the year from the first month. The command in Exodus 12:2, “This month *shall be* unto you the beginning of months,” should not be interpreted as evidence that all the months of the year should be calculated from the new moon of the first month. Although the new moon of the first month is the first new moon of the holy day year, it is not the new moon from which the new year is calculated. The Scriptures reveal that God ordained the new moon of the seventh month as the basis for calculating the new year.

The revelation of God's plan to Joseph takes on new meaning when we consider what is recorded in Psalm 81:3-5 in relation to the feasts of God: "Blow up the trumpet in the new moon, in the time appointed, on our solemn feast day. For this *was* a statute for Israel, *and* a law of the God of Jacob. This He ordained in Joseph *for* a testimony, when he went out through the land of Egypt, *where* I heard a language that I understood not."

## *The Role of the New Moon of the Seventh Month*

Calculating the new moon of the seventh month, or Tishri, is of paramount importance to the observance of the feasts of God—the proclamation of Tishri 1 declares the “New Year for Years” (Goldman, *The Talmud of the Land of Israel*, Vol. 16, pp. 35-39). The month of Tishri was the first month of the new year. Nisan 1 was then calculated from this benchmark.

The word translated "new moon" in the Hebrew text is the noun שׁדח *`ghõh'-desh* [2320]. A variant pronunciation of this word is used as a verb to express the action of renewing or restoring: "And when Asa heard these words, and the prophecy of Obed the prophet, he took courage, and put away the abominable idols out of the land of Judah and Benjamin, and out of the cities which he had taken from mount Ephraim, and **renewed** [שׁדח *`ghãh-dash'* [2318]] the altar of the LORD" (II Chron. 15:8). A third pronunciation, used as an adjective, expresses the meaning of newness: "And the Gentiles shall see thy righteousness, and all kings thy glory: and thou shalt be called by a **new** [שׁדח *`ghah-dãhsh'* [2319]] name, which the mouth of the LORD shall name" (Isa. 62:2).

When used as a noun, שׁדֹחַ *`ghõh'-desh* [2320] refers specifically to a new moon or to the month which it begins. The Hebrew word translated "full moon" is a different word (הסֵא *keh'seh* [3677]). *Keh'seh* is used only in Proverbs 7:20 and Psalm 81:3.

The first use of *`ghõh'-desh* [2320] as "new moon" is found in I Samuel 20:5. Brown, Driver and Briggs attest that this new moon was a religious festival (*Hebrew and English Lexicon of the Old Testament* p. 225). Since the only new moon that God ordained as a religious festival is the new moon of the seventh month, it is evident that this Scripture is referring to the Feast of Trumpets. Notice the account in I Samuel 20: "And David said unto Jonathan, 'Behold, tomorrow *is* **the new moon** [שׁדֹחַ *`ghõh'-desh* [2320]], and I should not fail to sit with the king at meat: but let me go, that I may hide myself in the field unto the third day at even" (verse 5).

How did David know that שׁדֹחַ *`ghõh'-desh* [2320] would occur on the following day? The only possible answer is that the new moon had been calculated in advance. The occurrence of the new moon would signal the beginning of the seventh month and the arrival of Tishri 1. David would be expected at the table of King Saul to participate in the banquet that would be held for the Feast of Trumpets.

Continuing in Verse 18 of I Samuel 20 we read, "Then Jonathan said to David, 'Tomorrow *is* **the new moon** [שׁדֹחַ *`ghõh'-desh* [2320]]: and thou shalt be missed, because thy seat will be empty.' " Jonathan did not say, "Tomorrow **may** be the new moon," or, "Tomorrow will **probably** be the new moon." He said, "Tomorrow ***IS*** the new moon." Jonathan spoke these words to David with absolute certainty. They both knew that the Hebrew Calendar had predicted the occurrence of the new moon on the following day.

*`Ghõh'-desh* is used again in Verse 24: "So David hid himself in the field: and when **the new moon** [שׁדֹחַ *`ghõh'-desh* [2320]] was come, the king sat him down to eat meat." The king was observing the religious festival of Tishri 1, according to the calculation of the Hebrew Calendar for the new moon of the seventh month. The account in Verse 24 shows that this observance was not held at the time of the astronomical conjunction, or "dark of the moon." The noun *`ghõh'-desh* is used in this verse with the

Hebrew verb היה *hãy-yãh'* [1961], translated "was come." *Hãy-yãh'* means to **arise** or **appear** (see Brown Driver Briggs, p. 225) and is used with this meaning in Genesis 1:5 in reference to the appearing of the evening (*erev*, or sunset) and the morning (*bo'ker*, or sunrise) on the first day of Creation.

The use of *hãy-yãh'* in I Samuel 20 reveals that when the king sat down to observe the Feast of Trumpets, the new moon was clearly visible in the evening sky. The new moon had appeared before King Saul and those who were feasting with him at the palace, and before David, who was hiding in the field. Here is undeniable evidence that the new moon of Scripture is not the astronomical conjunction. The astronomical conjunction takes place during the "dark of the moon," and is not visible from any point on earth. No part of the moon can appear in the sky during the astronomical conjunction. Yet the verb *hãy-yãh'* records that the new moon appeared in the sky above the palace of Saul and the field where David was hiding. (See Chapter Ten for explanation as to why a visible new moon is not always present at the declaration of Tishri 1.)

While David was in hiding, Jonathan was in the palace with his father King Saul. They had seen the new moon appear in the evening sky. They were partaking of the feast of the declaration of the new moon of the seventh month--the Feast of Trumpets. That day, which had been calculated in advance, was confirmed by the appearance of the new moon.

The record that we find in Psalm 81 shows that the calculation of the new moon of the seventh month was a law of God, delivered to the children of Israel at the time of the Exodus from Egypt:

"Blow up the trumpet in the new moon, in the time appointed, on our solemn feast day. For this *was* a statute for Israel, *and* a law of the God of Jacob. This He ordained in Joseph *for* a testimony, when he went out through the land of Egypt, *where* I heard a language *that* I understood not" (verses 3-5).

These verses declare that when God brought the descendants of Abraham, Isaac and Jacob out of Egypt, He ordained a testimony (Hebrew *geeh-dooth'* [5715], meaning a decree or code of law) concerning a new moon (Hebrew *`ghõh'-desh* [2320], referring to the occurrence of the new crescent) which was to be observed as a "solemn feast day." This new moon was the

first day of the seventh month, which we call the Feast of Trumpets. Verse 3 of Psalm 81 also refers to a full moon festival (Hebrew *keh'seh* [3677]). This full moon was the fifteenth day of the seventh month, which begins the Feast of Tabernacles. Although the King James Version does not translate *keh'seh* in this verse, the New King James does. *Keh'seh* is used only in Psalm 81:3 and in Proverbs 7:20.

The *`ghõh'-desh* [2320], or new crescent, of Psalm 81:3 is the only new moon that God commanded to be observed as an annual holy day. In fact, it is the only new moon commanded to be observed period. No assemblies were commanded for any other new moon. It is also the new moon that sets the calendar for all the holy days in the year, as Verses 4 and 5 of Psalm 81 testify. Notice: "For this *was* a statute for Israel, *and* a law of the God of Jacob. This He ordained in Joseph *for* a testimony, when he went out through the land of Egypt, *where* I heard a language that I understood not."

The word "**statute**" in Verse 4 is translated from the noun qh *`ghõhk* [2706]. The meaning of *`ghõhk* [2706] in this context is "**a law of a religious festival**" (Brown Driver Briggs, p. 349). The word "**law**" in Verse 4 is translated from the noun Tp*&m *mish-pãht'* [4941], and refers to "**a case or cause presented for judgment**" (Ibid., p. 1048). *Mish-pãht'* [4941] is synonymous with the noun qeqh *ghãh-kak'* [2710], meaning "**something prescribed**" (Ibid., p. 349), and with the noun qh *`ghõhk* [2706], which is translated "**statute**" in Verse 4.

The word "**ordained**" in Verse 5 is translated from the verb ?m*& *soom* 7760, meaning "to compute" (Ibid., p. 962). The word "**testimony**" in Verse 5 is translated from the noun Hwdo° *geeh-dooth'* [5715], meaning "**a code of law**" (Ibid., p. 730).

When we understand the meaning of the Hebrew words, it is evident that at the time of the Exodus from Egypt, God issued to Moses and Aaron "a law of a festival" (qh *`ghõhk* [2706]). The festival for which this law was issued was the new moon (*`ghõh'-desh* [2320]) of the seventh month. This law decreed that each year the new moon of the seventh month was to be presented for judgment (Tp*&m *mish-pãht'* [4941]) by computation (?m*& *soom*

[7760]), and that a written prescription (qeqh® *ghãh-kak'* [2710]), or calendar, was to be issued.

The record that we find in Psalm 81:3-5 reveals that God wrote the initial "calendar prescription" by computing the calendar for Israel at the time they left Egypt. He then delivered the rules for computation (the mathematics) to Moses and Aaron. It was decreed by God that the new moon of the seventh month be calculated year by year. This law further decreed that at the occurrence of this new moon, the first day of the seventh month be sanctified as a solemn assembly by the blowing of trumpets.

The command to blow the trumpets "**at** the new moon [*`ghõh'-desh* [2320]]" in Verse 3 is referring to the sanctification of the day as Tishri 1, the Feast of Trumpets. "At" is translated from the Hebrew preposition *beth*, which is used in its temporal sense to mark the exact time the horn is to be blown--at the occurrence of the new moon.

The Hebrew text states that trumpets are also to be blown "**at** the full moon [*keh'seh* [3677]]," although this command was omitted by the King James translators. "At" is again the Hebrew preposition *beth*, used in its temporal sense to mark the exact time the horn is to be blown--at the occurrence of the full moon. This blowing of trumpets refers to the sanctification of Tishri 1 and Tishri 15, the first day of the Feast of Tabernacles.

The commands for the "new moon" and the "full moon" in Psalm 81:3 make it absolutely clear that this verse is referring to the festivals of the seventh month. No other month of the year has both a new moon and full moon that were sanctified by God as annual holy days. It is the new moon of this month that God ordained as a law (*mish-pãht'* [4941]) for computing (*soom* [7760]) His holy days.

The Hebrew text clearly contradicts those who claim that the new moon of the first month should determine the appointed times of God. The new moon of the seventh month is the new moon that God ordained to set the months of the year. This law of God is recorded in Psalm 81, a song of Asaph--the chief musician among those who blew the trumpets in declaration of the new moon. Asaph also declares that God issued this law at the time that Israel went out of Egypt.

There is no Scriptural basis for using the new moon of the first month to calculate the beginning of the year. Those who do so are violating the clear decree of God Himself, as recorded in Psalm 81. The new moon of the seventh month is the time that God appointed for calculating His feast days throughout the year. The rules for the calculation of this new moon were delivered by God in the year of the Exodus and became the foundation of the Hebrew Calendar.

## *Understanding the Hebrew Calendar*

The Earth makes a complete circle of the Sun in approximately 365 days, thus creating a solar year. In each solar year, the Moon completes 12 orbits around the Earth, thus completing a lunar year. The lunar year, however, is completed in approximately 11 days less than the solar year.

This discrepancy between the length of the solar year and the length of the lunar year requires a periodic adjustment (an intercalation) in a calendar that uses the lunar cycle to determine the months of the year. Without such adjustments, the months of the year will gradually shift out of their normal climatic seasons. These periodic adjustments are referred to as "intercalations." The word "intercalation" simply means the addition of as much as a month or as little as a day or two to a calendar year. If a day or two are to be added to the length of a lunar year these intercalations are referred to as postponements.

By applying the rules of intercalation (in years 3, 6, 8, 11, 14, 17 and 19 of a 19-year cycle an extra month of 30 days is added), the Hebrew Calendar is periodically adjusted to the solar year so that the annual holy days of God remain in their original seasons from year to year. And, by applying the postponement rules of intercalation the lunar months of the calendar are synchronized with the new and full moons of Tishri and Nisan as closely as is possible. The Scriptures require that the months of the Hebrew Calendar, which begin with each new moon, be synchronized with the seasons (Lev. 23:4). These months, and the holy days that fall within them, center around three major harvest seasons. To keep them in synchronization with their respective harvest seasons, an additional month must be added at set intervals of years to correct the difference between the solar and lunar years. Because the Hebrew Calendar uses both the lunar cycle and the solar cycle to determine the months of the year, it is known as a luni-solar calendar.

By adding an additional month to seven years out of nineteen, the number of days in the solar year and the number of days in the lunar year can be synchronized within a small fraction—i.e., about two hours. This astronomical principle is known as the 19-year cycle. In each 3, 6, 8, 11, 14, 17 and 19 years of the cycle an extra month of 30 days is added. This additional month is called Adar I. Although the Hebrew Calendar was given directly to Moses by the revelation of God in 1486 BC, other peoples knew the 19-year astronomical cycles on which it is based. These astronomical cycles were widely used by ancient city-states and empires, whose calendars determined the months by the lunar year and therefore followed the principle of periodically adding an extra month.

Every lunar calendar that is synchronized with the climatic seasons of the solar year must use some form of intercalation. Even the Gregorian Calendar of today, which is strictly a solar calendar, intercalates every four years by adding an extra day to the month of February. By adding this extra day the beginning of March is "postponed" by one day. This intercalary day compensates for the quarter of a day per year that the calendar falls short of the solar year (which is 365 ¼ days). Because the Gregorian Calendar does not use the lunar cycle to determine the months of the year, (but elongates all months to either 30 or 31 days with February at 28—29 in a leap year), there is no other shortfall, and therefore no need to add an intercalary month.

The Hebrew Calendar requires intercalation on a much broader scale because the lunar cycle figures prominently in its calculations. To compensate for the shortfall of about 11 days less in the lunar year, the Hebrew Calendar intercalates every two to three years by adding a 13th month. In addition, one or two days are periodically added to keep the months of the year closely synchronized with the full moons of Nisan and Tishri. The intercalary months synchronize the Hebrew Calendar with the solar year so that the holy days of God are always observed in their appointed times, and the intercalary days (see Appendix A for a complete set of the rules of postponement) synchronize the calendar with the monthly cycles of the moon so that the feasts on Nisan 15 and Tishri 15 are observed as closely as possible with the best illumination of the full moon.

## *Determining the New Moon Day of the Seventh Month*

In the days of David (1050-1010 BC) and the early kings of Israel (970-800 BC), calculating the New Moon Day was a simple task because the lunar cycle was much more constant. But during the reign of Uzziah of Judah (808-756 BC) and the later reign of Hezekiah of Judah (723-695 BC), the hand of God directly altered the arrangement of the heavenly bodies. His divine intervention twice caused the position of the earth and the moon to shift in relationship to the sun. And, caused the moon to shift in relationship to the earth. As a result, there were many years when the new moon was not visible from Jerusalem until one or two days after the projected time of the molad.

The changes in the heavens required new steps to be added to the process of determining the new moon. Among the procedures that were instituted to adjust the Hebrew Calendar to the changes in the heavens are the Rules of Postponement. These rules do not postpone the observance of Tishri 1 past the time of the new moon, as some have claimed. To the contrary, they keep the observance of Tishri 1 in harmony with the lunar cycle in the heavens. In as many as six years out of ten, these rules must be applied in order to ensure that the declaration of Tishri 1 is as accurate as possible.

Maimonides, who lived from 1135 to 1204 AD, records that determining the New Moon Day often required the application of the Rules of Postponement. Is there any Biblical evidence to support the application of these rules?* The answer is revealed in the book of Ezra, which records the first observance of the Feast of Trumpets in Jerusalem after the return of the exiles of Judah.

On modern calendars, the astronomical conjunction of the moon is designated as the new moon. Because the conjunction takes place during the "dark of the moon," the new moon is depicted as a black circle. But the "new moon" of modern astronomy is not the new moon of Scripture. It is not the astronomical conjunction that determines the appointed times of

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* It is interesting to note that the Sons of Iddo listed in Ezra 8:17 were reputed to be expert in the rules of postponement. See *The Encyclopaedia Judaica*, s.v. "Calendar."

God, but the earliest possible visibility of the new crescent as calculated by the Hebrew Calendar. A minimum of 17.2 hours must pass from the time of the astronomical conjunction before the new crescent can possibly be seen by the naked eye of a trained observer working under perfect weather conditions.

The math underpinning the Hebrew Calendar calculates to the highest possible percentage of disc illumination for the full moons of Tishri 15 and Nisan 15*. In order to understand how the Hebrew Calendar accomplishes this feat, we must first learn the basis for its calculation of the Molad of Tishri. Contrary to popular belief, the Hebrew Calendar does not attempt to calculate the astronomical conjunction, as does the Naval Observatory.

The astronomical conjunction occurs when the earth, moon and sun are aligned on the same longitude. While the Naval Observatory uses detailed astronomical data to calculate the exact time of the astronomical conjunction, which takes place during the "dark of the moon," the Hebrew Calendar uses the ***average*** time of the conjunction, or the ***mean conjunction***, to calculate the molad (Maimonides, *Sanctification of the New Moon*, p. 27).

The fact that the Naval Observatory calculates to the astronomical conjunction explains why its figures differ from those of the Hebrew Calendar. Rather than calculating the astronomical conjunction, the Hebrew Calendar uses the average or mean conjunction, the molad, to declare the first day of Tishri. This mean conjunction provides a consistent basis for calculating Tishri from year to year. Actual time from one astronomical conjunction to another fluctuates from five minutes to three hours, and may vary more than 12 hours in the course of the year. To calculate the exact time of the conjunction each year would require double-precision (64-bit) arithmetic (Dershowitz and Reingold, *Calendrical Calculations*, p.135). The Hebrew Calendar resolves the problem by using the average or mean time—that is, 29½ days. Historical records trace this method at least back to the time of Ezra the Scribe.

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* See article entitled "Why the Full Moon Cannot be Determined by Observation" for full exegesis. Our website address is: www.cbcg.org.

The variation in the length of time between astronomical conjunctions is caused by the countless irregularities that occur in the moon's orbit. To date, astronomers have identified more than 5,000 perturbations of the moon as it circles the earth. Perturbations are small changes in the moons orbit caused by the attraction of another celestial body or bodies. Before modern astronomy with its computerized mathematics, it would have been an impossible task to calculate the exact astronomical conjunction from year to year and then calculate on that basis the day of the new moon. That is why God approved, through the Levites, the mean conjunction as the basis for calculating the new moon. The use of the mean conjunction, or molad, provides a simple, reliable and consistent basis for calculation.

Thus, the term "molad" does not refer to the astronomical conjunction of the moon, as many have assumed. The determination of the Molad of Tishri is not based on the exact time of the conjunction, but on the average time of the conjunction, which rarely coincides with the actual conjunction. The purpose in calculating the molad, or mean conjunction, is to determine the first day of Tishri. This astronomical feat is accomplished by applying a set of four rules that fine tune the Hebrew Calendar with the best possible disc illumination for Tishri 15.

If the calculated molad time falls before noon by Jerusalem time, and the day is not contradicted by the rules, that day is declared the "New Moon Day" or Tishri 1. If the calculated molad time falls after noon by Jerusalem time, rules are applied to adjust the declaration of Tishri 1 by a day or two forward on the calendar. These intercalations or postponements fine-tune the Hebrew Calendar to the realities of the lunar cycles.

Once Tishri 1 is set, two additional calculations are activated: the length of the lunar year is determined and the date of Nisan 1 is set. Although both of these activities pivot on the date of Tishri 1, they are totally independent of each other. The length of the lunar year is now determined by counting the number of calendar days between the newly declared Tishri 1 of the current fall season and Tishri 1 beginning the previous fall season. If this lunar year happens to be year 1, 2, 5, 7, 9, 10, 12, 13, 15, 16 or 18 of the 19-year cycle the year is declared to have either 353, 354 or 355 days. These are known as "common" years. Common years with lengths of 353 and 355 days are set by the adjustments to the date of the Molad of Tishri we discussed in the previous paragraph. If this lunar year happens to be year 3, 6, 8, 11, 14, 17 or 19 of the 19-year cycle an additional month of 30 days is

added and this year is said to be an “intercalated” or “leap year”. Leap years may have either 383, 384 or 385 days depending on the adjustments made to the date of the Molad of Tishri.

Thus the periodic addition of a month of 30 days and the periodic addition or subtraction of a day or two from months Cheshvan and Kislev keeps the Hebrew Calendar in close synchronization with the solar year as well as the lunar year. Quite a feat indeed!

The best possible illumination for Nisan 15 often coincides with the full moon of Tishri. All of this must be viewed as a continuum within each 19-year cycle, which repeats over periods of centuries. Due to the irregularity of the moon’s orbit (over 5,000 perturbations recorded to date), it is an astronomical impossibility that a perfect 100% illumination occur for both holy days in every year continuously over the decades and centuries. Although in most years the level of illumination will reach the 99 percentile and above, in one or two years of each 19-year cycle, illumination may dip to a low of 96-97% in Jerusalem (94-95% in other parts of the world).

These facts help to explain the prolonged high level of illumination of the March or April moon on occasion. It is this very phenomenon that prevents the determination of the holy days by observation. The human eye cannot discern the difference between 98% and 100% of disc illumination. Furthermore, since differing levels of illumination may be seen at any given time, depending on one’s geographical location, it is important to remember that the point of reference, according to Scripture, is Jerusalem. The determination of the full moon is based on the highest possible illumination for the area of Jerusalem, whether or not illumination in other geographical regions has attained the highest point. In addition, the calculation of the highest illumination possible is not made for the moon of Nisan 15, but for the moon of Tishri 15. This single calculation sets the date of both Nisan 1 and Tishri 1, since there is a fixed period of 177 days between Nisan 1 and Tishri 1.

The mathematical steps that are required for calculating the Hebrew Calendar are complex: the calculation of the Molad of Tishri, the understanding and application of the rules of postponement (which finally set the declaration of Tishri 1; the calculation of the length of years (there are six different year lengths set by the application of postponement rules); the intercalation of years (seven out of 19 in the right sequence); the

knowledge of which months are fixed and which are not (the months which are not fixed are tied to the postponement rules); the calculation of Nisan 1; and synchronization of the Hebrew Calendar with the Roman Calendar. These mathematical procedures cannot be understood without first learning the meaning of basic calendric and astronomical terms and then learning their application. Each reader who wishes to understand the Hebrew Calendar must make an effort to become familiar with the definition and application of these terms.

We have gone to great lengths to present this material in as clear and straightforward a manner as possible. However, there are a number of terms related to the Hebrew Calendar that may be difficult to understand. Words and phrases such as intercalation, postponement, conjunction, molad and civil year* are defined where possible as they are introduced in this paper. The basic principles of calendar mathematics are explained, and examples of their application are given throughout the paper.

The reader who is equipped with a basic understanding of these terms will recognize the validity of the facts that are presented. The first section of the paper outlines the Scriptural, historical, astronomical and mathematical evidence that the Hebrew Calendar we use today is the very same calendar used by Christ and the apostles. On this solid foundation of evidence we then examine the debate over the date 3761 BC, which the Hebrew Calendar uses for calculating the first molad. Next, we examine in detail the calendars of Herman Hoeh and Frank Nelte, pointing out the errors and inconsistencies in their material. We then examine calendar mathematics and their application to the first visible crescent of Passover, 30 AD and to the impossibility of a Wednesday Passover in 31 AD. Finally, we use basic calendar mathematics to reconstruct the calendar of Christ's time, from His birth in 5 BC to the destruction of the temple in 70 AD.

We realize that there are some who see no need for understanding the mathematics of the Hebrew Calendar. They believe that it is Scripturally based and live by its holy day declarations. Nevertheless, convincing

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*** Civil years** of the Hebrew Calendar run from Tishri 1 to Tishri 1. Civil Year 3831, for example, is calculated by counting the number of years from 3761 BC **to 70 AD.** As these civil years run from the fall of one Roman year into to fall of another, this numbering system is the easiest and most accurate means of determining the exact Hebrew year in question.

arguments have been published in recent years in opposition to the Hebrew Calendar. These publications have persuaded many to forsake the declarations of the Hebrew Calendar and observe the holy days on other calendar dates. It is therefore incumbent upon us to seek out the true facts in order to defend the Hebrew Calendar with vigor and diligence. We are duty-bound to defend our beliefs by "convincing (refuting) the gainsayer (contradictor)" (Titus 1:9). We believe the present Hebrew Calendar is the calendar God wishes us to observe. Paul's words, therefore, instruct us to refute the arguments of those who contradict the observance of the holy days as declared by the Hebrew Calendar. The persuasive arguments of those who reject the validity of the Hebrew Calendar must be thrust through with the sword of truth.

Over the years, we have spent many long hours studying the Scriptures related to the Hebrew Calendar, those sections of the Talmud that discuss the calendar, astronomical calculations related to the calendar, and historical data concerning the calendar. In comparing the Scriptural documentation of events with the dates that are recorded in the histories of men, we have not found one discrepancy between the Hebrew calendar dates and the historical and astronomical data.

Solar and lunar cycles from the period of the second temple until our day (a period of 2700 years) have been tracked by all knowledgeable cultures. These centuries include the life and ministry of Jesus, and the entire history of the church. Current calculations of the Hebrew Calendar, when compared with Scriptural and historical data back to the 700's BC, demonstrate that the calendar court of Ezra's time (the 6$^{th}$ century BC) and forward had the same knowledge now used by astronomical physicists to calculate events of the heavens. This knowledge was used continuously down to New Testament times, and it is recorded in Scripture that Jesus and His apostles, and the believers in the early years of the Christian era, observed the dates of God's feasts as calculated by the Hebrew Calendar.

As this paper demonstrates, Jesus and the apostles placed their stamp of approval on the declarations of the Hebrew Calendar by observing the holy days set by its calculations. Thus, it is not within our authority as Christians to pursue any other course in observing the holy days of God. Let us follow in the steps of the faithful believers of the New Testament era, and hold to the faith once delivered.

Christ, the Rock of Israel Who spoke to Moses on Mount Sinai, later came to earth in the flesh to magnify the laws of God, making them even more binding for spiritual Israel. Since those laws include the observance of God's holy days, it should be clear that God requires all of His people today to observe these days according to the rules that He Himself established by both by decree and personal example.

# Introduction

**It can be Scripturally, historically, astronomically and mathematically documented and demonstrated that:**

1) A calendar utilizing a 3, 6, 8, 11, 14, 17 and 19 year intercalary cycle has been in force since the time of Ezra.

2) A calendar utilizing the postponement rules has been in force since the time of Ezra, and that knowledge of a 19-year cycle has existed since the dawn of time.

3) The calendar of the New Testament:

a) utilized 19-year luni-solar cycles;

b) declared leap years by utilizing a fixed 3, 6, 8, 11, 14, 17 and 19 year set intercalary cycle—but not by the condition of the barley crop;

c) utilized six year lengths with the following number of days:

common years: 353, 354 and 355 days

leap years: 383, 384 and 385 days

d) utilized two months of varying lengths placed immediately after Tishri (years of—355 and 383 days. And, years of—353 and 385 days set only by postponement rules. Impossible to have 353 and 385 year lengths without activation of postponement rules). Heshvan and Kislev are used in combination:

| | | |
|---|---|---|
| Heshvan | 29 days | 353 length year |
| Heshvan | 29 days | 354 length year |
| Heshvan | 30 days | 355 length year |
| | | |
| Heshvan | 29 days | 383 length year |
| Heshvan | 29 days | 384 length year |
| Heshvan | 30 days | 385 length year |
| | | |
| Kislev | 29 days | 353 length year |
| Kislev | 30 days | 354 length year |
| Kislev | 30 days | 355 length year |
| | | |
| Kislev | 29 days | 383 length year |
| Kislev | 30 days | 384 length year |
| Kislev | 30 days | 385 length year |

e) utilized fixed, rotating month lengths in common years for:

| | |
|---|---|
| Tishri | 30 days |
| Heshvan | 29 days |
| Kislev | 30 days |
| Tevet | 29 days |
| Shevat | 30 days |
| Adar | 29 days |
| Nisan | 30 days |
| Iyar | 29 days |
| Sivan | 30 days |
| Tammuz | 29 days |
| Ab | 30 days |
| Elul | 29 days |

f) utilized fixed, rotating month lengths in leap years but added an additional Adar of 30 days between Shevat and Adar for:

| | |
|---|---|
| Tishri | 30 days |
| Heshvan | 29 days |
| Kislev | 30 days |
| Tevet | 29 days |
| Shevat | 30 days |
| | |
| Adar I | 30 days (added month) |
| | |
| Adar II | 29 days |
| Nisan | 30 days |
| Iyar | 29 days |
| Sivan | 30 days |
| Tammuz | 29 days |
| Ab | 30 days |
| Elul | 29 days |

An Adar of 29 days is always placed immediately before to Nisan

g) calculated the Molad of Tishri not the molad or conjunction of Nisan by:

the rules of postponement,

h) calculated year lengths by:

utilizing day-of-week rules of slippage which then set day variations in Heshvan and Kislev;

utilizing fixed month lengths,

utilizing a 3, 6, 8, 11, 14, 17 and 19 year intercalary cycle

i) calculated Nisan 1 by utilizing the 177-day rule

the 177-day rule matches the most common and most stable of the lunar ecliptic cycles (full moon of Nisan 15 to full moon of Tishri 15) and was written about in priestly literature as early as the 3rd century BC.

The 176-days and the 178 days compose the remaining lunar ecliptic cycles (full moon of Tishri 15 to full moon of Nisan 15). There are years when a lunar eclipse occurs at the full moon of Tishri, the full moon of Nisan and then the full moon of Tishri.

177 + 177 = 354-day year (Heshvan 29/Kislev 30)
177 + 176 = 353-day year (Heshvan 29/Kislev 29)
177 + 178 = 355-day year (Heshvan 30/Kislev 30)

j) Trumpets was never declared by the astronomical conjunction by any record we know of.

k) Trumpets was always declared by the calculation of the Molad of Tishri—utilizing postponements where necessary.

l) Trumpets was sanctified whether there was a visible crescent of the moon or not. Sometimes a visible crescent would coincide with the sanctification but such occurrences are impossible without the activation of postponement rules.

4) In the year of Jesus' birth, civil year 3757, 5 BC, Trumpets fell on a Saturday, September 2. This fact can be determined by astronomy and history without utilization of the Hebrew Calendar. It is also a fact that Trumpets in 5 BC was postponed by Rule 2. Tishri 22 was also celebrated before the fall equinox.

5) Trumpets, 26 AD, the year Jesus began His ministry, was a leap year and was postponed by Rules 1 and 2. Trumpets, 27 AD was postponed by Rule 1. This was the acceptable year of the Lord.

6) In the year of Jesus' crucifixion, civil year 3791, 30 AD, Trumpets fell on a Saturday, September 16. Trumpets was declared for this date even though there was no possibility of a visible crescent.

7) In the year of Jesus' crucifixion, civil year 3791, 30 AD, Passover fell on a Wednesday, April 5. Nisan 1 was declared for Thursday, March 23, 30 AD even though there was no possibility of a visible crescent.

8) In 31 AD Passover fell on a Monday and not on a Wednesday. Trumpets fell on a Thursday and not on the weekly Sabbath.

9) Trumpets was declared on Monday, September 8, in 66 AD, civil year 3827, as recorded by both history and the declarations of the Hebrew Calendar.

10) Trumpets was declared on Tuesday, September 5, in 69 AD, civil year 3830 and this fact can be verified by both historical and Hebrew Calendar record.

11) Trumpets was postponed by Rule 2 and was therefore declared on Monday, September 24, in 70 AD, civil year 3831. Both of these facts can be documented and proven by agreement between history, astronomy and Hebrew Calendar declarations.

12) We can document the use of months of fixed length in the Nisan through the Elul period of 66 to 70 AD.

13) Therefore, the Hebrew Calendar of 5 BC to 70 AD was declared by an averaging process, involving set lengths for certain months of the year. Months were not declared by time of conjunction or crescent moons.

14) Passover was celebrated on or before the spring equinox on:

March 20, 13 BC
March 22, 5 BC
March 19, 2 BC
March 21, 7 AD
March 22, 15 AD
March 19, 18 AD
March 21, 26 AD
March 22, 34 AD
March 20, 37 AD
March 20, 45 AD
March 19, 56 AD
March 21, 64 AD
March 21, 72 AD
March 20, 75 AD

15) Tishri 22 was celebrated on or before the fall equinox on:

| | |
|---|---|
| September 25, | 16 BC |
| September 21, | 13 BC |
| September 23, | 5 BC |
| September 19, | 2 BC |
| September 25, | 4 AD |
| September 22, | 7 AD |
| September 23, | 15 AD |
| September 20, | 18 AD |
| September 25, | 23 AD |
| September 23, | 26 AD |
| September 23, | 34 AD |
| September 21, | 37 AD |
| September 25, | 42 AD |
| September 21, | 45 AD |
| September 24, | 53 AD |
| September 20, | 56 AD |
| September 24, | 61 AD |
| September 22, | 64 AD |
| September 22, | 72 AD |
| September 21, | 75 AD |

16) Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively, was activated on:

| | | |
|---|---|---|
| Wednesday, | September 14, | 17 BC |
| Sunday, | September 19, | 12 BC |
| Wednesday, | September 27, | 10 BC |
| Friday, | September 5, | 8 BC |
| Thursday, | September 20, | 4 BC |
| Friday, | September 17, | 1 BC |
| Wednesday, | September 23, | 5 AD |
| Wednesday, | September 3, | 4 AD |
| Sunday, | September 12, | 6 AD |
| Sunday, | September 8, | 9 AD |
| Wednesday, | September 16, | 11 AD |
| Saturday, | September 23, | 13 AD |
| Sunday, | September 20, | 16 AD |
| Thursday, | September 9, | 17 AD |
| Friday, | September 6, | 20 AD |
| Friday, | September 22, | 24 AD |
| Wednesday, | September 12, | 25 AD |
| Sunday, | September 1, | 26 AD |
| Friday, | September 19, | 27 AD |
| Wednesday, | September 8, | 28 AD |
| Wednesday, | September 5, | 31 AD |
| Wednesday, | September 24, | 32 AD |
| Wednesday, | September 21, | 35 AD |
| Sunday, | September 9, | 36 AD |
| Friday, | August 30, | 37 AD |
| Sunday, | September 25, | 40 AD |
| Friday, | September 11, | 44 AD |
| Friday, | September 24, | 51 AD |
| Wednesday, | September 13, | 52 AD |
| Sunday, | September 2, | 53 AD |
| Wednesday, | September 10, | 55 AD |

16) Rule 1 (continued): When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively, was activated on:

| | | |
|---|---|---|
| Sunday, | September 14, | 60 AD |
| Wednesday, | September 22, | 62 AD |
| Friday, | August 31, | 64 AD |
| Sunday, | September 27, | 67 AD |
| Friday, | September 13, | 71 AD |
| Wednesday, | August 30, | 75 AD |

17) Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day, was activated on:

| | | |
|---|---|---|
| Sunday, | September 3, | 16 BC |
| Sunday, | September 15, | 9 BC |
| Thursday, | September 20, | 4 BC |
| Friday, | September 1, | 5 BC |
| Monday, | September 25, | 2 AD |
| Saturday, | September 11, | 6 AD |
| Saturday, | September 23, | 13 AD |
| Thursday, | September 9, | 17 AD |
| Monday, | September 14, | 22 AD |
| Saturday, | August 31, | 26 AD |
| Thursday, | August 29, | 37 AD |
| Monday, | September 26, | 29 AD |
| Wednesday, | September 17, | 38 AD |
| Monday, | September 3, | 42 AD |
| Sunday, | September 22, | 43 AD |
| Friday, | September 8, | 47 AD |
| Friday, | September 20, | 54 AD |
| Wednesday, | September 6, | 58 AD |
| Wednesday, | September 26, | 59 AD |
| Sunday, | September 11, | 63 AD |
| Sunday, | September 23, | 70 AD |
| Friday, | September 9, | 74 AD |

18) Rule 3: When the Molad of Tishri of a common year falls on a Tuesday, at or after 9 hours and 204 parts, the declaration of Tishri 1 is advanced to Wednesday. The application of Rule 1 advances the declaration one more day to Thursday. Rule 3 was activated on:

| | | |
|---|---|---|
| Tuesday, | September 22, | 5 AD |
| Tuesday, | September 11, | 25 AD |
| Tuesday, | September 23, | 32 AD |
| Tuesday, | September 12, | 52 AD |
| Tuesday, | September 25, | 59 AD |

19) Rule 4: When the Molad of Tishri of a common year immediately following an intercalary year occurs on a Monday, at or after 15 hours and 589 parts, the declaration of Tishri 1 is advanced to Tuesday. Rule four was not activated.

# Chapter One

When Jesus was twelve years old, He observed the Passover season with His parents and thousands of other Jews in Jerusalem. Our Savior, Jesus Christ, the Son of God, observed over 600 feast days during His lifetime from 5 BC to 30 AD. Throughout His ministry, from the fall of 26 AD to the spring of 30 AD, He observed the feast days with His disciples, whom He appointed as His apostles. From the time of His ascension in 30 AD to the destruction of the temple in 70 AD, more than 760 feast days were observed by the apostles and believers in Jerusalem and in other nations where the Jews had been scattered. There is no evidence that Jesus or the apostles who lived during the period between 5 BC and 70 AD observed these holy days, with the exception of Passover, on any days other than those observed by the majority of the Jews of that time.

Many have been led to believe that the Hebrew Calendar of New Testament times was regulated solely by observation of the new moon, or calculation of the conjunction, or the equinoxes or constellations or the state of the barley crop. They are convinced that the Hebrew Calendar of today, with its set pattern of intercalation and its rules of postponements is evidence of the corruption of the original calendar. After all, doesn't the Talmud describe the procedure for determining the new moon, and didn't Rabbi Akiba once intercalate three months in a row? And didn't the early Babylonian community observe Atonement on Fridays and Sundays? According to this view, there was no calculated calendar in existence at the time of Jesus and the apostles. There were no rules of postponement. There were no fixed lengths of lunar months. There was nothing like the calendar we know today. The Hebrew Calendar of today, so goes the story, was invented by the rabbis of Judaism long after the time of Christ over many centuries of debate and trial and error.

Written records in the Talmud and various Jewish Encyclopedias appear to support the claim that the Hebrew Calendar is a product of rabbinical debate, molded by the opinions of leading rabbis of Palestine and Babylonia. Their teachings are presented as the sole basis for the present intercalary cycle of 3, 6, 8, 11, 14, 17 and 19 years in each 19-year luni-solar cycle. Furthermore, the rules of postponement are presumed to be arbitrary rules that the rabbis devised for the sake of religious convenience. These rules,

we are told, prevent the true observance of the holy day seasons by moving the holy days from the correct dates.

Voices from many quarters have been raised in objection to the calculated Hebrew Calendar of today. They view the fact that Rabbi Akiba once intercalated three months in a row as proof that the intercalary cycle of the second century was haphazard and random.

Was Rabbi Akiba's action an indication that no intercalary cycle had yet been established? When we examine the historical facts, we find that this was not the case at all. Rabbi Akiba was simply attempting to restore the long established intercalary cycle utilized by the Hebrew Calendar, which had been disrupted by the Bar Kokhba revolt (Akiba's nephew). It is difficult to understand why he would intercalate three years in a row as he is reputed to be one of Rabbinic Judaism's greatest scholars. Is this act evidence of his ignorance in calendar matters? Anyone with an elementary knowledge of luni-solar calendars knows that you cannot play solar catch-up by adding back 90 days within a three-year period! The correct intercalary cycle was restored by the Levites of the Calendar Court, which had borne this responsibility since the days of Ezra.

Another objection has been raised over a record in the *Baraitha* of Samuel that in 776 AD the conjunction of Tishri fell on a Wednesday at 0 hours and 363 parts. According to modern calendar reckoning, argues one author, the Hebrew Calendar places the conjunction not at 0 hours but at the 3rd hour and 363 parts. Therefore, he concludes that the calculations of the Hebrew Calendar of today do not match the calculations of ancient times.

When we check the conjunction figures for Tishri 776 AD, we find that the conjunction occurred shortly after 6 PM Tuesday evening (the beginning of Wednesday by calendar reckoning), and that the Molad of Tishri occurred shortly after 9 PM, about 3 hours later. In reading the record in the *Baraitha*, the above-mentioned author carelessly assumed that the astronomical conjunction of Tishri was the same as the Molad of Tishri. However, the two are not the same. The calculation of the Molad of Tishri is based on the average lunar cycle. It is not determined by the occurrence of the conjunction.

Much doubt has arisen over the Hebrew Calendar as a result of the statement in the *Encyclopaedia Judaica* that there is "…unimpeachable

evidence from the works of writers with expert knowledge of the calendar that the present *ordo intercalationis** and *epochal molad*** were not intrinsic parts of the calendar of Hillel II, these being seen still side by side with other styles of the *ordo intercalationis* and the *molad* as late as the 11th century."

This statement in the *Encyclopaedia Judaica* is regarded as evidence that the present intercalary cycle of the Hebrew Calendar was not adopted until the 11th century. This, however, is not the case. It is a historical fact that the present cycle of 3, 6, 8, 11, 14, 17 and 19 years has been in effect since the days of Ezra. The statement in the *Encyclopaedia Judaica* relates to the fact that some rabbis challenged the established cycle of intercalation and continued to advance their own ideas until the 11th century.

This statement in the *Encyclopaedia Judaica* is followed by an explanation of basic principles of intercalation. All luni-solar calendars from the dawn of time utilized some form of intercalation. In fact, it is impossible to maintain an accurate luni-solar calendar without intercalating 7 years out of 19. Thus, the calendar of Hillel II had to have used at least a set intercalary pattern even though the debates continued down into the Middle Ages. In the same edition of the encyclopedia, under the article "Hillel II," a growing number of calendar scholars believe that the calendar of Hillel II had been fixed for centuries before its release.

Despite this acknowledgment, many have rejected the calculations of the Hebrew Calendar and have turned to observation. They believe that the Hebrew Calendar was originally declared month by month by empirical observation and the decision of the Sanhedrin. How do they know this? Because medieval and modern rabbinic sources state that it was so. And where did they get their information? From earlier rabbis, whose opinions are recorded in the Talmud and the Mishnah.

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* *Ordo Intercalationis* refers to four debated orders of intercalation within a 19-year cycle: years 2, 5, 7, 10, 13, 16, 18; years 1, 4, 6, 9, 12, 15, 17; years 3, 5, 8, 11, 14, 16, 19; or years 3, 6, 8, 11, 14, 17, 19. The Hebrew Calendar has always utilized a 3, 6, 8, 11, 14, 17, 19 year order.

** *Epochal Molad* refers to the year BC in which the *Molad* of Tishri is thought to have occurred. 3761 BC is the *Epochal Molad* of cycle 3, 6, 8, 11, 14, 17, 19.

A close examination of Babylonian Talmudic writings, however, shows that the statements of earlier rabbis have been greatly misunderstood and misrepresented by modern day calendar critics. One of the earliest and most complete descriptions we have in the Talmud regarding observation of the moon is contained in the tractate *Rosh ha-Shanah*, beginning with section 20a and continuing through 25. In this tractate, rabbinic authorities quote and debate the Mishnah as they argue the merits of observation vs. non-observation of the new moon of Tishri 1 and Nisan 1. They conclude that the day of Trumpets can be sanctified whether or not the new crescent has been observed. This conclusion, recorded in the Mishnah, but then quoted and debated many years later in the Talmud, testifies to the authority of the *Bet Din*, or Calendar Court of ancient Palestine. Rabbi Eleazar b. Zadok was the grandson of Rabbi Eleazar b. Zadok I who, as a young priest, witnessed the destruction of the temple:

> MISHNAH. THE HEAD OF THE BETH DIN SAYS, SANCTIFIED', AND ALL THE PEOPLE REPEAT AFTER HIM, SANCTIFIED, SANCTIFIED. WHETHER THE NEW MOON IS SEEN AT ITS PROPER TIME OR NOT AT ITS PROPER TIME, IN EITHER CASE [THE NEW MOON] IS SANCTIFIED. R. ELEAZAR B. ZADOK, HOWEVER, SAYS THAT IF IT IS NOT SEEN AS [AT] ITS PROPER TIME [THE NEW MOON] IS NOT [FORMALLY] SANCTIFIED, BECAUSE HEAVEN HAS ALREADY SANCTIFIED IT (Talmud - Mas. Rosh HaShana 24a).

In the same tractate, the rabbis also discuss the fixed length of Adar I (30 days) and Adar II (29). Having accepted these lengths as fixed, Nisan 1 was proclaimed automatically at the end of 29 days regardless of moon observation or equinox. They discuss the fixed length of Elul at 29 days and agree that it had been fixed since the days of Ezra. They discuss the fixed length of days between Nisan 1 and Tishri 1, which is always 177 days, and the fact that calculations always took precedence over observation. As the footnotes to the Soncino version of the Babylonian Talmud attest, those who opposed a fixed calculated calendar appealed to the Kabbalah or the Tradition of the Elders as Jesus referred to it, as their authority.

The New Testament records show that in regard to keeping the holy days, the early apostolic church functioned in perfect harmony, with widely

scattered Jewish and Gentile believers observing the festivals on the same dates. The apostle Paul, who traveled throughout Asia Minor, Macedonia and Greece in his ministry to the Gentiles, observed the festival days at the same dates and times as did the Christians of Judea. When Peter and the party of the circumcision arrived in Antioch to observe Passover and Unleavened Bread, they observed these days at the same time as the Gentile believers who were with Paul. When Paul was brought back from Corinth in the fall of 53 AD, he observed the Feast of Tabernacles at Jerusalem with Peter, James and John at the same time they did, and at the same time the temple authorities did. How did Paul know when to leave for Jerusalem? The city of Corinth was located many hundreds of miles from Jerusalem. Without advance notice of the date of the festival, Paul would not have been able to arrive at Jerusalem in time for this observance.

The evidence that is presented in the following pages will show that the calendar in use at the time of Christ and the apostles was calculated in the same manner as the Hebrew Calendar of today. Without a calendar that was published well in advance and accessible to all, daily business, governmental and religious activities would have been nigh impossible. The existence of such a calendar is amply demonstrated in the writings of the New Testament and in secular and religious histories.

New material has been unearthed which contains clear proof that the intercalary cycle of today was in effect in the days of Jesus and the apostles, and that the rules of postponement were also a vital part of the calendar of New Testament times. Historical and astronomical records of 5 BC, combined with the chronology of the events of 30 AD, 66 AD, 69 AD and 70 AD, establish a fixed time frame for the calendar years in the lifetime of Jesus and the apostles.

The validity of the four Gospels and the book of the Acts of the Apostles stands or falls on the declarations of the Hebrew Calendar of the first century AD. These books of the New Testament clearly record that the feasts observed by Jesus and the apostles were based on these declarations. When viewed in the light of historical and astronomical records, the evidence that is presented in the pages of the New Testament offers irrefutable proof that the Hebrew Calendar of today was the calendar of Jesus and the apostles. This paper attempts to set forth the evidence in a clear and understandable manner for all who desire to know and follow the truth.

Recorded in tractate *Rosh ha-Shanah*, is a major calendar debate between Rabbi Abba of Palestine and Rabbi Samuel of Babylonia. Abba was a member of the Calendar Court and an acknowledged expert in calendar calculations. Samuel was head of one of the rabbinic academies in Babylonia. In debating with Abba, Samuel boasts that he is quite able to make a calendar for the whole of the Diaspora, to which Abba responds with a question concerning Postponement Rule 2—the "12 noon rule":

> Samuel said: **I am quite able to make a calendar for the whole of the Diaspora**. Said Abba the father of R. Simlai to Samuel: Does the Master know [the meaning] of this remark which occurs in [the Baraitha known as] the secret of the Calendar? **'If the new moon is born before midday or after midday'? [the 12 noon rule] — He replied: I do not. He then said to him: Since the Master does not know this, there must also be other things which the Master does not know.** When R. Zera went up [to Palestine], he sent back word to them [in Babylon]: It is necessary that there should be [on New Moon] a night and a day of the new moon. This is what Abba the father of R. Simlai meant: 'We calculate [according to] the new moon's birth. If it is born before midday, then certainly it will have been seen shortly before sunset. If it was not born before midday, certainly it will not have been seen shortly before sunset'. What is the practical value of this remark? — R. Ashi said: To [help us in] confuting the witnesses (Talmud - Mas. Rosh HaShana 20b).

It is recorded elsewhere that Rabbi Samuel also attempted to impress Rab Johanan, the leading authority and President of the Calendar Court in Palestine, by calculating the intercalation of months for sixty years. Rab Johanan replied, "He only knows mere [simple] calculations." Rabbi Samuel had not been educated in the secrets of intercalation, nor the fixing of months, nor the proper lengths of the years, nor the rules of postponement, and thus he **published** a faulty sixty-year calendar (yes, calendars **were** published at that time). Rab Johanan, on the other hand, was a true "counselor," one who knew the secrets for determining the intercalation of years, the fixation of the months and the application of postponement rules.

As this Talmudic record illustrates, controversies over calendar calculations have existed for many centuries. Other rabbis of old, completely ignorant of the mathematical basis for the rules of postponement, argued that Rule 1 shifts the Feast of Trumpets forward one day simply for the convenience of worship.

Many today, like Rabbi Samuel and other uninstructed rabbis of old, are attempting to construct their own calendars. Some have published papers that discredit the Hebrew Calendar, causing many to turn to observation or to the astronomical conjunction as their authority. In their misguided zeal, they are leaving the calendar that has been the authority for the observance of God's holy days from the time of Ezra to the founding of the New Testament church—and is still the authority for the observance of these holy days by Christians today.

The following presentation offers Scriptural, historical, astronomical and mathematical evidence that the calendar of Christ and the apostles was declared by calculation, not by conjunction, observation or equinox. That it was intercalated with the same intercalary cycle we use to this day; that the lengths of the months were fixed as they are today; that the length of years was set to six and only six lengths, as are those of today; and, that it was fine tuned to the astronomical and mathematical realities of the solar system by using the same rules of postponement we use today.

## Trumpets 70 AD
## Civil Year
## 3831

We will continue our investigation with historical evidence concerning the Hebrew Calendar of Christ's day. Josephus' narration of the destruction of the temple and the upper city of Jerusalem in 70 AD, Hebrew Calendar year (civil year) 3831, gives us the first clues to its construction. Josephus records that the temple was destroyed on the 10th of Ab, the same date on which the first temple was destroyed.

> So Titus retired into the tower of Antonia, and resolved to storm the temple the next day, early in the morning, with his whole army, and to encamp round about the holy house. But as for that house, God had, for certain, long ago doomed it to the fire; and now that fatal day was come, according to the revolution of ages; **it was the tenth day of the month Lous, [Ab,] upon which it was formerly burnt by the king of Babylon**; although these flames took their rise from the Jews themselves, and were occasioned by them; for upon Titus's retiring, the seditious lay still for a little while, and then attacked the Romans again, when those that guarded the holy house fought with those that quenched the fire that was burning the inner [court of the] temple; but these Romans put the Jews to flight, and proceeded as far as the holy house itself. At which time one of the soldiers,

> without staying for any orders, and without any concern or dread upon him at so great an undertaking, and being hurried on by a certain divine fury, snatched somewhat out of the materials that were on fire, and being lifted up by another soldier, he set fire to a golden window, through which there was a passage to the rooms that were round about the holy house, on the north side of it. As the flames went upward, the Jews made a great clamor, such as so mighty an affliction required, and ran together to prevent it; and now they spared not their lives any longer, nor suffered any thing to restrain their force, since that holy house was perishing, for whose sake it was that they kept such a guard about it (Josephus, *Wars*, 6:4:5).
> http://www.ccel.org/j/josephus/works/war-6.htm

We know from history that this occurred in 70 AD. The *Encyclopaedia Judaica* testifies that the temple was destroyed on the 9th of Ab, 70 AD. As was the case with the first temple, the temple was breached on the 9th of Ab, fire was set to the temple and it burned on through the 10th of Ab finally fully destroying it.

> With the siege of Jerusalem, the Temple became the focus of the whole war. The Romans' first step toward capturing the Temple Mount was their breach of the wall of the Fortress of Antonia (on the third of Tammuz). On the ruins of this fortress, they constructed a ramp which reached the inner wall of the court in four places (Wars 6:150–1). On the 17th of Tammuz the *tamid* sacrifice ceased to be offered (Ta'an. 4:6)—possibly because there were no priests available capable of performing the prescribed service (Wars 6:94). The Temple porticos were destroyed by fire between the 22nd and 28th of Tammuz (*ibid.*, 164–8; 177–9, 190–2). The frequent Roman assaults on the wall of the court were repulsed until the eighth of Av, when Titus gave orders to set fire to the gates of the court (*ibid.*, 241). The next day a council was held at the Roman headquarters to decide upon the fate of the Temple. According to Josephus *(ibid.)*, Titus did not want the Temple to be demolished, but a different source, probably based on Tacitus, states that he demanded its destruction. In Josephus' account the burning of the Temple is accidental, resulting from a Roman soldier having thrown a burning torch through a window into one of the Temple chambers on the north side. In spite of Titus' efforts to contain the flames (so Josephus says), another torch was thrown against the Temple gate (apparently the gate of the sanctuary because the entrance hall was not closed by a gate), and the entire building went up in flames, except for two gates (Wars 6:281). The Jewish defenders fought with desperate bravery until the very last, and when they saw the edifice go up in flames many threw themselves into the fire. According to Josephus (Wars, 6:248–50) **the catastrophe occurred on the tenth of Av in the year 70 C.E.; according to the Talmud (Ta'an. 29a) on the ninth.** Some of the Temple vessels were saved from destruction and fell into the hands of the Romans. They are depicted on one of the reliefs on Titus' victory arch in Rome (see Titus, Arch of) (*Encyclopaedia Judaica*, s.v. "Temple").

Rabbinic authorities quoted in Babylonian Talmudic Tractate Ta'anith 29a record that the 10th of Ab in both cases was a Sunday.

> [ON THE NINTH OF AB] THE TEMPLE WAS DESTROYED THE FIRST TIME. For it is written, **Now in the fifth month, on the seventh day of the month, which was the nineteenth year of King Nebuchadnezzar, king of Babylon, came Nebuzaradan the captain of the guard, a servant of the King of Babylon, unto Jerusalem. And he burnt the house of the Lord** etc. And it is further written, **Now in the fifth month [Ab], in the tenth day of the month, which was the nineteenth year of King Nebuchadnezzar, king of Babylon**, came Nebuzaradan the captain of the guard, who stood before the king of Babylon into Jerusalem etc. With reference to this it has been taught: We cannot say that this happened on the seventh, for it has already been stated that it was 'in the tenth'; and we cannot say that this happened on the tenth, for it has already been stated that it was 'on the seventh'. How then are these dates to be reconciled? **On the seventh [of Ab] the heathens entered the Temple and ate therein and desecrated it throughout the seventh and eighth [of Ab] and towards dusk of the ninth [of Ab] they set fire to it and it continued to burn the whole of that day, as it is said, Woe unto us! for the day declineth, for the shadows of the evening are stretched out. And this is what R. Johanan meant when he said: Had I been alive in that generation I should have fixed [the mourning] for the tenth [of Ab], because the greater part of the Temple was burnt thereon.** How will the Rabbis then [explain the contradiction]? — The beginning of any misfortune is of greater moment.
>
> AND [THE TEMPLE WAS DESTROYED] THE SECOND TIME. Whence do we know this? For it has been taught: Good things come to pass on an auspicious day, and bad things on an unlucky day. It is reported that the day on which **the First Temple was destroyed was the eve of the ninth of Ab [Ab 10], a Sunday**, and in a year following the Sabbatical year, and the Mishmar of the family of Jehoiarib were on duty and the Levites were chanting the Psalms standing on the Duchan. And what Psalm did they recite? — [The Psalm] containing the verse, And He hath brought upon them their own iniquity; and will cut them off in their own evil [Psalm 94:23]. And hardly had they time to say, 'The Lord our God will cut them off',19 when the heathens came and captured them. The same thing too happened in the Second Temple.

Cassius Dio, a Roman historian, records that the Temple was breached on the Sabbath.

> Titus, who had been assigned to the war against the Jews, undertook to win them over by certain representations and promises; but, as they would not yield, he now proceeded to wage war upon them. The first battles he fought were indecisive; then he got the upper hand and proceeded to besiege Jerusalem. This city had

three walls, including the one that surrounded the temple. The Romans, accordingly, heaped up mounds against the outer wall, brought up painter engines, joined battle with all who sallied forth to fight and repulsed them, and with their slings and arrows kept back all the defenders of the wall; for they had many slingers and bowmen that had been sent by some of the barbarian kings. 3The Jews also were assisted by many of their countrymen from the region round about and by many who professed the same religion, not only from the Roman empire but also from beyond the Euphrates; and these, also, kept hurling missiles and stones with no little force on account of their higher position, woman being flung by the hand and some hurled by means of engines. They also made sallies both night and day, whenever occasion offered, set fire to the siege engines, slew many of their assailants, and undermined the Romans' mounds by removing the earth through tunnels driven under the wall As for the battering-rams, sometimes they threw ropes around them and broke them off, sometimes they pulled them up with hooks, and again they used thick planks fastened together and strengthened with **iron,** which they let down in front of the wall and thus fended off the blow of still others. But the Romans suffered most hardship from the lack of water; for their supply was of poor quality and had to be brought from a distance. The Jews found in their underground passages a source of strength; for they had these tunnels dug from inside the city and extending out under the walls to distant points in the country, and going out through them, they would attack the Romans' water-carriers and harass any scattered detachments. But Titus stopped up all these passages.

In the course of these operations many on both sides were wounded and killed. Titus himself was struck on the left shoulder by a stone, and as a result of this accident that arm was always weaker. In time, however, the Romans scaled the outside wall, and then, pitching their camp between this and the second circuit, proceeded to assault the latter. But here they found the conditions of fighting different; for now that all the besieged had retired behind the second wall, its defense proved an easier matter because its circuit was shorter. Titus therefore once more made a proclamation offering them immunity. But even then they held out, and those of them that were taken captive or deserted kept secretly destroying the Romans' water supply and slaying any troops that they could isolate and cut off from the rest; hence Titus would no longer receive any Jewish deserters. Meanwhile some of the Romans, too, becoming disheartened, as often happens in a protracted siege, and suspecting, furthermore, that the city was really impregnable, as was commonly reported, went over to the other side. The Jews, even though they were short of food, treated these recruits kindly, in order to be able to show that there were deserters to their side also.

Though a breach was made in the wall by means of engines, nevertheless, the capture of the place did not immediately follow even then. On the contrary, the defenders killed great numbers that tried to crowd through the opening, and they also set fire to some of the buildings near by, hoping thus to check the further progress of the Romans, even though they should gain possession of the wall. In

this way they not only damaged the wall but at the same time unintentionally burned down the barrier around the sacred precinct, so that the entrance to the temple was now laid open to the Romans. Nevertheless, the soldiers because of their superstition did not immediately rush in; but at last, under compulsion from Titus, they made their way inside. Then the Jews defended themselves much more vigorously than before, as if they had discovered a piece of rare good fortune in being able to fight near the temple and fall in its defense. The populace was stationed below in the court, the senators on the steps, and the priests in the sanctuary itself. 3And though they were but a handful fighting against a far superior force, they were not conquered until a part of the temple was set on fire. Then they met death willingly, some throwing themselves on the swords of the Romans, some slaying one another, others taking their own lives, and still others leaping into the flames. And it seemed to everybody, and especially to them, that so far from being destruction, it was victory and salvation and happiness to them that they perished along with the temple. Yet even under these conditions many captives were taken, among them Bargiora, their leader; and he was the only one to be executed in connexion with the triumphal celebration.

**Thus was Jerusalem destroyed on the very day of Saturn [Saturday, Ab 9, 70 AD], the day which even now the Jews reverence most.** From that time forth it was ordered that the Jews who continued to observe their ancestral customs should pay an annual tribute of two denarii to Jupiter Capitoline. In consequence of this success both generals received the title of imperator, but neither got that of Judaïcus, although all the other honours that were fitting on the occasion of so magnificent a victory, including triumphal arches, were voted to them.

Loeb Classical Library, 9 volumes, Greek texts and facing English translation: Harvard University Press, 1914 thru 1927. Translation by Earnest Cary. Cassius Dio, Roman History, Epitome of Book LXV:LXVI:4-7
http://www.ukans.edu/history/index/europe/ancient_rome/E/Roman/Texts/Cassius_Dio/65*.html

Putting all these reports together we realize that the temple was set fire on a Saturday, Ab 9 and burned through Sunday, Ab 10, 70 AD. These dates including the very day of the week agree perfectly with the calculations of the Hebrew Calendar!

A few paragraphs later, and in the same narrative, Josephus states that after the destruction of the temple, the armies of Titus set about to raise banks against the upper city of Jerusalem. Josephus records that this work began on the 20th of Ab:

NOW when Caesar perceived that the upper city was so steep that it could not possibly be taken without raising banks against it, he distributed the several parts

> of that work among his army, and **this on the twentieth day** of the month Lous [Ab] (Josephus, *Wars*, 6:8:1).
> http://www.ccel.org/j/josephus/works/war-6.htm

Now, as the following table illustrates, the 20th of Ab, 70 AD was a Wednesday.

| | | | | |
|---|---|---|---|---|
| Saturday, | August 4, 70 AD | Ab | 9 | Temple Burned |
| **Sunday,** | **August 5, 70 AD** | **Ab** | **10** | **Temple Burned** |
| Monday, | August 6, 70 AD | Ab | 11 | |
| Tuesday, | August 7, 70 AD | Ab | 12 | |
| Wednesday, | August 8, 70 AD | Ab | 13 | |
| Thursday, | August 9, 70 AD | Ab | 14 | |
| Friday, | August 10, 70 AD | Ab | 15 | |
| Saturday, | August 11, 70 AD | Ab | 16 | |
| Sunday, | August 12, 70 AD | Ab | 17 | |
| Monday, | August 13, 70 AD | Ab | 18 | |
| Tuesday, | August 14, 70 AD | Ab | 19 | |
| Wednesday, | August 15, 70 AD | Ab | 20 | |

Josephus also records that this work was completed in eighteen days on the 7th of Elul:

> And **now were the banks finished on the seventh day of the month Gorpieus, [Elul,] in eighteen days' time,** when the Romans brought their machines against the wall (Josephus, *Wars*, 6:8:4).
> http://www.ccel.org/j/josephus/works/war-6.htm

As the following table illustrates, the 7th of Elul, 70 AD was a Saturday.

| | | | |
|---|---|---|---|
| Thursday, | August 16, 70 AD | Ab | 21 |
| Friday, | August 17, 70 AD | Ab | 22 |
| Saturday, | August 18, 70 AD | Ab | 23 |
| Sunday, | August 19, 70 AD | Ab | 24 |
| Monday, | August 20, 70 AD | Ab | 25 |
| Tuesday, | August 21, 70 AD | Ab | 26 |
| Wednesday, | August 22, 70 AD | Ab | 27 |

| | | | |
|---|---|---|---|
| Thursday, | August 23, 70 AD | Ab | 28 |
| Friday, | August 24, 70 AD | Ab | 29 |
| Saturday, | August 25, 70 AD | Ab | 30 |
| | | | |
| Sunday, | August 26, 70 AD | Elul | 1 |
| Monday, | August 27, 70 AD | Elul | 2 |
| Tuesday, | August 28, 70 AD | Elul | 3 |
| Wednesday, | August 29, 70 AD | Elul | 4 |
| Thursday, | August 30, 70 AD | Elul | 5 |
| Friday, | August 31, 70 AD | Elul | 6 |
| | | | |
| **Saturday,** | **September 1, 70 AD** | **Elul** | **7** |

It is plain to see, therefore, that the month of Ab, 70 AD had 30 days just as it does today. There is no other way to arrive at a count to Elul 7—unless Ab has 30 days. But how many days did Elul have? The Talmud records that the length of Elul had been fixed at 29 days since the days of Ezra. Hinena b. Kahana of Babylonia, an early third century AD rabbi, is quoted as stating that Elul had never been prolonged; i.e., had a 30th day added to it. Notice that both sides in the argument agree on this:

> 'From the days of Ezra onwards we have found no instance of Elul being prolonged'! — [Exactly so]: 'We find no instance', Talmud - Mas. Rosh HaShana 19b

Scripture also verifies that Elul had 29 and only 29 days from the time of Ezra. The following quote is taken from our paper *The Feast of Trumpets 2000*, page 14. In reference to the length of Elul at Haggai's time, we wrote:

**Haggai 1:14-15 Confirms the Calendar Calculations of 519 BC**

> And the LORD stirred up the spirit of Zerubbabel the son of Shealtiel, governor of Judah, and the spirit of Joshua the son of Josedech, the high priest, and the spirit of all the remnant of the people; and they came and did work in the house of the LORD of hosts, their God, in the four and twentieth day of the sixth month, in the second year of Darius the king" (Hag. 1:14-15).
>
> History places the second year of Darius Hystaspes in 519 BCE (April to April, Persian reckoning). Haggai dates the building of the temple from the twenty-fourth day of the sixth month—less than a week before the declaration of Tishri 1, the first day of the seventh month. The calculations of the Hebrew Calendar for that year place the *Molad* of Tishri at 5:31 PM (Jerusalem Time. Hereafter JT) on

Friday, September 14. Since the *Molad* did not fall before noon of that day, as required by Postponement Rule 2, the declaration of Tishri 1 was made on the following day, Sabbath, September 15.

The fact that the first day of the seventh month, or Tishri 1, was a weekly Sabbath demonstrates that the sixth month, or Elul, was only twenty-nine days in length, as it is today. If the month of Elul had consisted of thirty days, the twenty-fourth day of that month would have fallen on a weekly Sabbath (counting backward from Tishri 1). The Scriptures rule out any possibility of the twenty-fourth day being a weekly Sabbath, as Haggai records that the people spent that day working on the temple. Thus Haggai's account of the building of the temple supports the calculations of the Hebrew Calendar for the end of the sixth month and the beginning of the seventh month, or Tishri.

Haggai's confirmation of the Hebrew Calendar carries even more weight when we understand that the declaration of Tishri 1, the first day of the seventh month, was made before the new crescent was visible. Astronomical calculations for the year 519 BCE place the conjunction of the moon after the *Molad*, which fell at 5:31 PM (JT) on Friday evening. Since the new crescent does not become visible until at least 17.2 hours after the astronomical conjunction which fell at 9:52 PM (00.04 Universal Time. Hereafter UT) Friday, September 14, there was no possibility of sighting the new crescent until after the day had been declared. As in 536 BCE, the declaration of the Feast of Trumpets in 519 BCE was based strictly on calculation.

Both sides in the rabbinic debate acknowledge that from the time of Ezra, Elul had 29 days. And, that if Elul where to be intercalated by the Jewish Babylonians it would truly "mess up" the calendar season for Tishri and the rest of the year. This means the calendar courts had kept detailed records for centuries before Christ.

Continuing our count from Elul 7 through Elul 29 we learn that the Feast of Trumpets in 70 AD occurred on a Monday, September 24. This date was gleaned from the facts of history and also just happens to match the date declared by the Hebrew Calendar we currently use!

| | | | |
|---|---|---|---|
| Sunday, | September 2, 70 AD | Elul | 8 |
| Monday, | September 3, 70 AD | Elul | 9 |
| Tuesday, | September 4, 70 AD | Elul | 10 |
| Wednesday, | September 5, 70 AD | Elul | 11 |
| Thursday, | September 6, 70 AD | Elul | 12 |
| Friday, | September 7, 70 AD | Elul | 13 |
| Saturday, | September 8, 70 AD | Elul | 14 |

| | | | |
|---|---|---|---|
| Sunday, | September 9, 70 AD | | Elul 15 |
| Monday, | September 10, 70 AD | | Elul 16 |
| Tuesday, | September 11, 70 AD | | Elul 17 |
| Wednesday, | September 12, 70 AD | Elul | 18 |
| Thursday, | September 13, 70 AD | | Elul 19 |
| Friday, | September 14, 70 AD | | Elul 20 |
| Saturday, | September 15, 70 AD | | Elul 21 |
| | | | |
| Sunday, | September 16, 70 AD | | Elul 22 |
| Monday, | September 17, 70 AD | | Elul 23 |
| Tuesday, | September 18, 70 AD | | Elul 24 |
| Wednesday, | September 19, 70 AD | Elul | 25 |
| Thursday, | September 20, 70 AD | | Elul 26 |
| Friday, | September 21, 70 AD | | Elul 27 |
| Saturday, | September 22, 70 AD | | Elul 28 |
| | | | |
| Sunday, | September 23, 70 AD | | Elul 29 |
| | | | |
| **Monday,** | **September 24, 70 AD** | **Tishri 1** | **Trumpets** |

When we check the Hebrew Calendar for civil year 3830, 70 AD we should find Ab 9 listed as a weekly Sabbath day. And, when we check the civil year 3831 we should find that the Feast of Trumpets has been declared for a Monday, September 24, 70 AD. Indeed, this is exactly what we find! The Feast of Trumpets is declared for a Monday, September 24, 70 AD and Ab 9 is declared for a weekly Sabbath, August 4, 70 AD!

A Hebrew Calendar utilizing a 3, 6, 8, 11, 14, 17 and 19 intercalary pattern thus matches the facts of history for 70 AD as recorded by the Jewish historian Flavius Josephus, the Roman historian Cassius Dio and attested to by the *Encyclopaedia Judaica* and the Talmud. This Hebrew Calendar also informs us that civil year 3830, Trumpets 69 AD, was the $11^{th}$ year of the 19-year cycle and the $4^{th}$ of 7 leap years in that cycle and contained 384 days. As this Hebrew Calendar matches the facts of history, there is no reason to doubt that civil year 3830, beginning with Trumpets 69 AD is a leap year and that the 3, 6, 8, 11, 14, 17 and 19 intercalary cycle it utilizes is the correct cycle.

However, a Hebrew Calendar utilizing a 2, 5, 7, 10, 13, 16 and 18 year intercalary pattern, as does that of Herman Hoeh, John Kossey, Robert Newman, Frank Nelte and Ambassador College, does not declare civil year 3830, Trumpets 69 AD a leap year. It declares it a common year of 354 days. Thus, this calendar does not match the facts of history. It does, however, declare the Feast of Trumpets for a Monday, September 24, 70 AD, as does a 3, 6, 8, 11, 14, 17 and 19 year cycle, and gives the length of year as 355 days. Civil year 3829, Trumpets 68 AD is declared a leap year of 385 days (instead of 355 days as it should be declared), the 4th year of the 2, 5, 7, 10, 13, 16 and 18 year intercalary cycle and the 10th year of the 19-year cycle.

We know from history that the 9th of Ab fell on a Sabbath in 70 AD. As we have demonstrated above, Ab had 30 days, 70 AD. This fact leaves 21 remaining days in Ab before Elul 1. We have also demonstrated that Elul had 29 days, 70 AD. 21 days plus 29 days equals 50 days. 50 days from Ab 9 places the Tishri 1 on a Monday, 70 AD.

The astronomical conjunction of Tishri, 70 AD occurred at 6:37 AM (04:37 Universal Time. Hereafter UT) Jerusalem time, on a Sunday, September 23. The *molad* of Tishri, 70 AD fell at 5:47 PM (15:47 UT), late Sunday afternoon, September 23. **Therefore, Trumpets, 70 AD, by reference to either conjunction or *molad* calculation, was postponed by Rule 2* to Monday, September 24. Rule 2 states**:

Opponents of a calculated Hebrew Calendar would have Trumpets 70 AD, fall on Sunday, September 23 in synchronization with the astronomical conjunction. The facts contained in the preceding pages prove, however, that Trumpets 70 AD did not fall and could not have fallen on a Sunday. The historical facts surrounding the destruction of the temple on Sabbath, Ab 9 place Trumpets on Monday, September 24, 70 AD.

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*** Rule 2:** When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

# Chapter Two

## Trumpets 66 AD
## Civil Year
## 3827

Josephus also records that a Galilean murdered the High Priest Ananias and his brother Hezekiah—his name was Manahem son of Judas. This murder took place on the Hebrew Calendar date of Elul 7 at the beginning of the Jewish Wars with Rome.

> But Manahem and his party fell upon the place whence the soldiers were fled, and slew as many of them as they could catch, before they got up to the towers, and plundered what they left behind them, and set fire to their camp. **This was executed on the sixth day of the month Gorpieus [Elul].**
>
> **But on the next day the high priest was caught where he had concealed himself in an aqueduct; he was slain, together with Hezekiah his brother, by the robbers:** hereupon the seditious besieged the towers, and kept them guarded, lest any one of the soldiers should escape. Now the overthrow of the places of strength, **and the death of the high priest Ananias**, so puffed up Manahem, that he became barbarously cruel; and as he thought he had no antagonist to dispute the management of affairs with him, he was no better than an insupportable tyrant…(Josephus, *Wars*, 2:17:8-9).

Josephus also records that this murder took place on the weekly Sabbath.

> **…for indeed it so happened that this murder was perpetrated on the sabbath day**, on which day the Jews have a respite from their works on account of Divine worship (Josephus, *Wars*, 2:17:9).

History records that the year of Ananias murder was 66 AD, at the very beginning of the Jewish Wars with Rome (*Encyclopaedia Judaica*, s.v., "Menahem Son of Judah").

Below is a reconstruction of the Hebrew month Elul to the Hebrew month Tishri 1, civil year 3826, 66 AD demonstrating from history that Tishri 1 that year occurred on Monday, September 8.

Elul

| | | | |
|---|---|---|---|
| 1 | Sunday | August 10 | |
| 2 | Monday | August 11 | |
| 3 | Tuesday | August 12 | |
| 4 | Wednesday | August 13 | |
| 5 | Thursday | August 14 | |
| **6** | **Friday** | **August 15** | |
| **7** | **Saturday** | **August 16** | **Date Ananias Murdered** |
| 8 | Sunday | August 17 | |
| 9 | Monday | August 18 | |
| 10 | Tuesday | August 19 | |
| 11 | Wednesday | August 20 | |
| 12 | Thursday | August 21 | |
| 13 | Friday | August 22 | |
| 14 | Saturday | August 23 | |
| 15 | Sunday | August 24 | |
| 16 | Monday | August 25 | |
| 17 | Tuesday | August 26 | |
| 18 | Wednesday | August 27 | |
| 19 | Thursday | August 28 | |
| 20 | Friday | August 29 | |
| 21 | Saturday | August 30 | |
| 22 | Sunday | August 31 | |
| 23 | Monday | September 1 | |
| 24 | Tuesday | September 2 | |
| 25 | Wednesday | September 3 | |
| 26 | Thursday | September 4 | |
| 27 | Friday | September 5 | |
| 28 | Saturday | September 6 | |
| 29 | Sunday | September 7 | |

Tishri Civil Year 3827 66 AD

**1 Monday September 8**

When we check the Hebrew Calendar for the civil year of 3826, 66 AD, we should find Elul 7 listed as a weekly Sabbath day, August 16. And, when we check the calendar for Tishri 1, civil year 3827, 66 AD, we should find that the Feast of Trumpets has been declared for a Monday, September 8. Indeed, this is exactly what we find! The Feast of Trumpets is declared for a Monday, September 8, 66 AD and Elul 7 is declared for a weekly Sabbath, August 16, 66 AD!

**However, a Hebrew Calendar utilizing a 2, 5, 7, 10, 13, 16 and 18 intercalary year pattern declares civil year 3826, Tishri 1, 65 AD a leap year of 385 days.** In so doing, it places Trumpets for civil year 3827 on a Thursday, October 9, 66 AD, one full month later than a Hebrew Calendar utilizing a 3, 6, 8, 11, 14, 17 and 19 year intercalary pattern. This of course places the 7th of Elul, 66 AD on a Saturday, September 16, instead of Saturday, August 16! The following chart illustrates this point.

Elul 66 AD

| | | |
|---|---|---|
| 7 | Saturday | September 16 |
| 8 | Sunday | September 17 |
| 9 | Monday | September 18 |
| 10 | Tuesday | September 19 |
| 11 | Wednesday | September 20 |
| 12 | Thursday | September 21 |
| 13 | Friday | September 22 |
| 14 | Saturday | September 23 |
| 15 | Sunday | September 24 |
| 16 | Monday | September 25 |
| 17 | Tuesday | September 26 |
| 18 | Wednesday | September 27 |
| 19 | Thursday | September 28 |
| 20 | Friday | September 29 |
| 21 | Saturday | September 30 |

Elul 66 AD continued.

| | | |
|---|---|---|
| 22 | Sunday | October 1 |
| 23 | Monday | October 2 |
| 24 | Tuesday | October 3 |
| 25 | Wednesday | October 4 |
| 26 | Thursday | October 5 |
| 27 | Friday | October 6 |
| 28 | Saturday | October 7 |
| 29 | Sunday | October 8 |

Tishri 66 AD

| | | |
|---|---|---|
| 1 | Monday | October 9 |

Dr. Hoeh's as well as Nelte's calendar places Elul 7, 66 AD on a Saturday, September 16. But there is no way this date can be reconciled with the facts of history. Therefore, a 2, 5, 7, 10, 13, 16 and 18 year intercalary pattern is a myth. It never was utilized in Hebrew Calendar calculations. It should not be utilized in our Hebrew Calendar calculations. But it should be forever discarded to the junk heap of untenable ideas.

The astronomical conjunction occurred at 12:15 PM (10:15 UT), Jerusalem time, Monday, September 8, 66 AD. The Molad of Tishri occurred on Monday, 11 hours and 77 parts, September 8, 66 AD. The Feast of Trumpets was declared by molad (not by lunar conjunction, which by Rule 2 would have declared for Tuesday) time for Monday, September 8, 66 AD.

We have demonstrated that a Hebrew Calendar utilizing an intercalary sequence of 3, 6, 8, 11, 14, 17 and 19, agrees with the facts of history at two critical check points:

> the date of the death of the high priest Ananias at the beginning of the Jewish Wars Saturday, August 16—Elul 7, 66 AD;

and the destruction of the temple at the end of the Jewish Wars
Saturday, August 4—Ab 9, 70 AD.

With this in mind, let us now reconstruct civil year 3830, 69 AD and then leap back in time from the period of the Jewish Wars to the time of the birth of Christ in 5 BC. As we shall see, we also have a lock on two more historical dates that perfectly match the pattern of the Hebrew Calendar we use today.

# Chapter Three

## Trumpets 69 AD
## Civil Year
## 3830

The historical evidence that we have presented clearly demonstrates that Trumpets 70 AD fell on a Monday, September 24. This evidence also demonstrates that Trumpets 66 AD fell on a Monday, September 8. Both dates agree with and independently confirm the accuracy of a Hebrew Calendar utilizing a 3, 6, 8, 11, 14, 17 and 19 leap year* pattern. This intercalary pattern also declares 66 AD a leap year as well as 69 AD. But how many days did this leap year have—383, 384 or 385? We will now determine the length of this leap year without relying on the Hebrew Calendar. In order to determine this figure we must determine the date of the Feast of Trumpets, 69 AD. By this means we will then be able to determine the number of days between Tishri 1, 69 AD and Tishri 1, 70 AD.

The Feast of Trumpets fell in September in 69 AD. We know that the feast was observed in this month because a Tishri 1 observance in October would give us a year of only 355 days in length. This is at least 30 days too short for the year, which was a leap year. No leap year is ever less than 383 days long. If we place Trumpets in the month of August 69 AD, this would give us a year from Tishri 1, 69 AD to Tishri 1, 70 AD of over 400 days. This is astronomically impossible—no year of any lunar calendar has ever been 400 days or more in length.

September 69 AD, therefore, is the only month that fits the astronomical and historical facts. But on which day of this month did Tishri 1 fall? In order to determine this, we must look at the records of astronomy. The astronomical conjunction of September 69 AD fell at 11:21 AM (09:21 UT) Jerusalem time, Monday, September 4. The molad for this month occurred at 8:10 PM (18:10 UT) Jerusalem time, Monday, September 4. If we declare

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* A **leap year** is any of three types of years in the Hebrew Calendar; a deficient leap year contains 383 days (353 + 30), a regular leap year contains 384 days (354 + 30) and a perfect leap year contains 385 (355 + 30) days. See also **common year**.

Tishri 1 for a Monday, September 4, the year 69 AD will be 385 days in length. On the other hand, if we declare Tishri 1 for Tuesday, September 5, the year 69 AD will be 384 days in length.

Now, if we were to declare Trumpets 69 AD for Monday, September 4, we push Elul 69 AD back one day, thus shifting every month backward by one day through the historically verified events of 66 AD. **That is, we would be pushing an established number of days for this span backward into the next span.** Doing so would shift the date of the assassination of the High Priest Ananias from Saturday, Elul 9, 66 AD to Friday, Elul 8, 66 AD. We must therefore declare Tuesday, September 5 the Feast of Trumpets 69 AD, thus making the year one of 384 days. It so happens that a Hebrew Calendar utilizing a 3, 6, 8, 11, 14, 17 and 19 leap year pattern declares the Feast of Trumpets, 69 AD for Tuesday, September 5, the same date as we have just declared mathematically and astronomically.

Now, since the astronomical conjunction of Tishri, 69 AD fell at 11:21 AM (09:21 UT) Jerusalem time, Monday, September 4. And, the Molad of Tishri occurred at 8:10 PM (18:10 UT) Jerusalem time, Monday, September 4, but Trumpets was not declared until Tuesday, September 5, we know that it was postponed either by Rule 2* or possibly by Rule 4** but not by conjunction.

Now, what have we learned about Trumpets 69 AD?

That Trumpets was declared by molad calculations, and not by the lunar conjunction or observation. Why? Because the conjunction occurred at 11:21 AM (09:21 UT), Jerusalem time, Monday, September 4, 69 AD, but the Molad of Tishri occurred about 10 hours later that evening. Therefore, a Tuesday Trumpets was declared by the molad, and not on Monday by the conjunction or observation.

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*** Rule 2:** When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

**** Rule 4**: When the Molad of Tishri of a common year immediately following an intercalary year occurs on a Monday, at or after 15 hours and 589 parts, the declaration of Tishri 1 is advanced to Tuesday.

If we insist on declaring Trumpets by conjunction, (70 AD already being fixed by facts we have already proven), we would create a 385-day year. What would one then have to admit? That postponements did exist, since 385-day years cannot mathematically or astronomically happen without postponements.

Conclusion. In every example we find, where there is a question of conjunction or molad times, the day is always declared according to the molad calculation of the calculated Hebrew Calendar. On dates we can prove, the conjunction is superseded by the molad when they fall on opposite sides of the 12:00 noon, 18 hour limit.

If not postponed until Tuesday by Rule 2, this means it was declared Monday, which is a real problem for those who do not like postponements. Why? Have we not learned that we can only have a 385-day lunar year when postponements are present? Yes, indeed! Knowing that Trumpets 70 AD was declared on Monday (for reasons already validated), and that the Hebrew Calendar has declared the period 69-70 AD as a 384-day year, if we back Trumpets 69 to Monday instead of Tuesday, we have 385 days.

No, we cannot move 70 AD back to Sunday (instead of Monday) to avoid 385 days. Why? Again, have we not learned that Elul can have only 29 days, in which case Trumpets 70 AD had to fall on Monday in order that Ab 9 could be declared on a weekly Sabbath. **Else we back up Elul, thus backing up Ab, causing the 9th to occur on Friday—yet history and calendar calculations validate that it fell on Sabbath.** So, we are stuck between a rock and a harder place, and both of them are postponements.

We should also mention since we can demonstrate that both Trumpets 69 AD and 70 AD were accurately declared according to the same rules of the Hebrew Calendar that are still extant, this places Tabernacles 69 AD beginning on September 19, a full 5 days before the fall equinox. (The fall equinox occurred on September 24 at 22:33:57 UT in 69 AD.) Yet there are those who ignore the Hebrew Calendar and declare Tishri 15, the High

Sabbath beginning the Feast of Tabernacles, 2002 a month later on October 21, 2002. Why? Because they feel that the Hebrew Calendar declares Tishri 15 too early by placing it on Saturday, September 21—2 days before the fall equinox which occurs at 4:56:28 UT on September 23, 2002.*

Now that we have established the date of Trumpets 69 AD and that its length is 384 days, we may now proceed to determine the lengths of months for civil year 3830—69 AD. We will do so in two parts: first by providing several examples of the dates and times of lunar declarations of the summer of 70 AD, which clearly demonstrate a lunar calendar based on an averaging process of calculation, and not one based on finite declarations referenced to the exact time of the molad, lunar conjunction, or visible crescent for each new month. And, second we will "flesh out" the remaining months by working forward from Tishri 69 AD to Nisan 70 AD.

The leap year of civil year 3830 beginning with Trumpets 69 AD, had a length of 384 days as we have just demonstrated. As such it is classified as a leap regular. Common regular years, the parent of a common leap regular, have 354 days and are modeled after the average length of a lunar year; i.e., the average lunar month has 29.5 days. Multiply this number by 12 lunations in a solar year and we arrive at the figure 354 days. Thus the length of the year is set by astronomical fact.

Each month in a common civil year, beginning with Tishri, alternates between 30 and 29 days. This is due to the fact that Hebrew Calendar days run from sunset to sunset, each day being 24 hours. Thus calendar days must be represented in whole numbers. The only way of doing this is to alternate months between 30 and 29 days. In a common regular year the month of Tishri has 30 days, while each following month alternates between 29, then 30 then 29 and so on until we reach the 12$^{th}$ month of Elul which ends the year with 29 days.

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* Frank Nelte teaches that both the Passover and Tabernacle seasons of 2002 are declared too early by the Hebrew Calendar. As we can see by the evidence presented above this teaching is simply not true and has no historical or calendric standing whatsoever. Nelte places Passover/Unleavened Bread 2002 a month too late and does the same for the fall Tabernacles festival season.

A leap regular year is simply a common regular year plus a leap or intercalary month of 30 days, thus giving us a year length of 384 days. The point being, the lengths of the months in a common regular and a leap regular are the same and also have the same 30/29/30/29 rotation cycle with a second Adar of 30 days thrown in as the only difference.

With this knowledge in hand, we should expect to see month lengths and a month sequence for civil year 3830, 69-70 AD as follows:

> Tishri with 30 days, Heshvan with 29 days, Kislev with 30 days, Tevet with 29 days, Shevat with 30 days, Adar I (the leap month) with 30 days, Adar II with 29 days, Nisan with 30 days, Iyar with 29 days, Sivan with 30 days, Tammuz with 29 days, Ab with 30 days and Elul with 29 days.

This is exactly what we see when we reconstruct this year from astronomical data. Let us begin our archaeological dig in astronomical data, totally independent of Hebrew Calendar declarations, to verify that the above assertion is indeed true. Our adventure takes us first of all to the period of Nisan, 70 AD to Tishri, 70 AD. We will work backwards from Tishri through Nisan to demonstrate our point with astronomical data.

We have demonstrated that the Feast of Trumpets of 70 AD was declared by history for Monday, September 24, 70 AD. Both sides in the rabbinic debate acknowledge that from the time of Ezra, Elul had 29 days. And, that if Elul were to be intercalated by the Jewish Babylonians it would truly mess up the calendar season for Tishri and the rest of the year. This means the calendar courts had kept detailed records for centuries before Christ.

Data of the lunar phases of the summer of 70 AD already given demonstrates clearly that the length of Ab was fixed at 30 days, just as it still is in 2002 AD, and that this fixing is done by an averaging method of calculation, which, at times, may ignore any reference to the moon's finite phase, once the calculation of Tishri 1 has been determined. That is, day one of the sixth month Elul, 70 AD was fixed and, in effect, backed up 29 days from Trumpets, and the first of Ab was fixed and backed up 30 days from Elul, just as is still done in our time. The molad and conjunction times of the first day of Elul, 70 AD, will prove that to be the case.

Since Tishri 1, by the Hebrew Calendar was declared on Monday,

September 24, 70 AD, we can know that the day was not declared by the astronomical conjunction, as that time occurred at 6:37 AM (04:37 UT), Sunday morning, September 23, 70 AD, Jerusalem time, while the molad calculation fell at 5:47 PM (15:47 UT), late Sunday afternoon. Therefore, Monday was declared by molad averaging of 29.53 days per month. Likewise, Tishri 1 was not declared by the visible crescent of the eve of Trumpets, as the conjunction falling at 6:37 AM does not allow enough time for the crescent to appear as the Molad of Tishri occured a little more than 12 hours later at 5:47 PM. A minimum of 17.2 hours must pass from the time of the astronomical conjunction before the new crescent can possibly be seen by the naked eye of a trained observer working under perfect weather conditions. (Please also run the program "moonc52" written by Dr. Monzur Ahmed for verification of this fact. Access "Google", enter "moonc52" and then click on "SAC." Look for "moonc52.zip" at number 1006 and click on that file line.)

If declaration had been concluded by conjunction time, Sunday would have been declared Trumpets in that year. This would place the ninth of Ab on a Friday instead of the weekly Sabbath (by a 29 day reckoning for Elul). But, both the Talmud and *Encyclopaedia Judaica* record that the fire that burned the second temple began on the ninth of Ab, which is said to have been a weekly Sabbath. The Hebrew Calendar confirms this lunar date as a Sabbath by day of the week. Moreover, the Talmud records that Elul had been fixed at 29 days since the days of Ezra. So, we are faced with a set of known cross points which agree in witness that the Hebrew Calendar of today is still determined by the same methods; as those methods, rolling back to 70 AD, agree with the statements of the Talmud, *Judaica*, simple mathematics, historical and astronomical data.

By simply counting 29 days back from Monday, September 24, 70 AD, we arrive at the first day of Elul—Sunday, August 26, 70 AD. The astronomical conjunction of Elul occurred at 4:28 PM (14:28 UT) Jerusalem time, on Friday, August 24, in 70 AD, but the molad calculation fell about 5:00 AM (03:00 UT), Jerusalem time on Saturday, August 25, 70 AD. We calculate the Molad of Elul by knowing that **one-month** previous to Tishri 1 would be 1.53 days earlier than the 5:47 PM molad near the evening of Trumpets. But, Elul was not declared until Sunday, August 26. This plainly tells us that the month of Elul was not declared by either molad or astronomical conjunction, as both would place the first day of Elul on Saturday, yet it was not declared until Sunday. So, we see that Elul was not

declared by a finite definition based on either the conjunction or molad times, but simply, as it were, by backing up 29 days from Trumpets.

**If we want to say that a visible crescent was present on Saturday evening and therefore Elul, 70 AD was declared by observation, we must then admit that Trumpets 70 AD was not declared by observation.** So, no pattern can be gathered from the facts at hand, other than the fact that Elul was not declared, as already stated, by any constant pattern of astronomical evidence. It was declared rather by a fixed method, which required a sixth lunar month of 29 days. The finite lunar phase was not a consideration in that instance, any more than it is for the declarations of the Gregorian Calendar, which is also proclaimed by an averaging process. The declaration of the Day of Trumpets is the only annual lunar date consistently locked to finite molad calculations, but even then, the formula is often modified by the averaging rules of postponement**. Jesus did not object to such methods of calculation during His ministry, and they are still in use today.**

Data of the lunar phases of the summer of 70 AD also clearly demonstrates that the length of Ab was fixed at 30 days, just as it is to this very day, and that this fixing is done by an averaging method of calculation, which, at times, may ignore any reference to the moon's finite phase, once the calculation of Tishri 1 has been determined. That is, day one of the sixth month Elul, 70 AD was fixed and backed up 29 days from Trumpets, and the first of Ab was backed up 30 days from Elul, just as is still done in our time. The molad and conjunction times of the first day of Elul, 70 AD, prove this to be the case.

30 days previous to Sunday, August 26 would place the first day of Ab on Friday, July 27, 70 AD. Now, the Molad of Ab fell at about 4:19 PM (14:19 UT), Jerusalem time, Thursday, July 26, 70 AD, but the astronomical conjunction occurred about 5:36 AM (03:36 UT) Jerusalem time, Thursday morning, July 26, 70 AD. The first day of Ab, by counting back fixed month lengths was declared to be Friday, July 27, 70 AD; therefore it could be referenced to the molad (which fell in the afternoon of the day before), but not the astronomical conjunction, which occurred well before 12:00 noon. **If by conjunction, Thursday, the day before, would have been declared.** But that would give Ab 31 days, and not 30 as it was so fixed in 70 AD. To conclude, the re-construction of Ab and Elul verify that Ab had

30 and Elul 29 days, just as they still do today. To think otherwise does not agree with the provable facts.

The Molad of Tammuz, 70 AD can be calculated to about 3:35 AM (01:35 UT), Jerusalem time, Wednesday morning, June 27, 70 AD. The astronomical conjunction fell at about 9:18 PM (19:18 UT), Jerusalem time, Tuesday, June 26, 70 AD. The fixed length averaging method assigned Tammuz a length of 29 days, as it still does, with the first day of the month declared on Thursday, June 28 of that year. So, we see that Tammuz was not declared by molad calculation, which fell well before noon on Wednesday, nor was it declared on Wednesday by the lunar conjunction of 6:58 PM Tuesday evening. Rather it was declared by a fixed averaging method which pre-determined that Tammuz should have 29 days, following a 30 day Sivan, and followed by the 30 days of Ab. This would have to place Tammuz 1 on Thursday, June 28, regardless of the exact lunar phase.

The Molad of Sivan in 70 AD occurred about 2:51 PM (12:51 UT), Jerusalem time, Monday afternoon, May 28, 70 AD, with the astronomical conjunction occurring at 2:20 PM (12:20 UT) on the same day. In this case, both the molad and conjunction times would agree on a declaration of Tuesday, May 29, 70 AD, as the Hebrew Calendar verifies. Obviously, this declaration is merely coincidental, since declarations of other months demonstrate that neither a conjunction or molad determination is necessary for declaration of months other than Tishri, and even that has rules of modification already in place.

Josephus strongly implies in his discourse of the Wars of the Jews, 5:11:4, that Iyar was assigned 29 days in 70 AD, just as it is today. The Molad of Iyar for that year is calculated to have occurred at about 1:35 AM (23:35 UT), Sunday, April 29; and the astronomical conjunction took place at 7:30 AM (05:30 UT) Jerusalem time, on the same day. Both of these events are well before noon on Sunday, but the first day of Iyar was not declared until the next day, Monday, April 30, 70 AD. That date was not declared by molad calculation, but by a fixed length, which says, that Nisan has 30 days.

Why does Josephus say Iyar 29 rather than the first of Sivan? For the same reason one today might say, “by December 31,” meaning the last day of one time before a new point in time is reached.

Now, when did the Molad of Nisan, 70 AD occur? Twenty-eight days places successive days of a month on the same day, but we are dealing with a molad circle average, which says that we are 1.53 days previous to that on the month before. So, this places the Molad of Nisan one day and 12.73 hours before 1:46 AM (23:46 UT), Jerusalem time, Sunday, April 29 (which is Iyar 1), which is 36.73 hours before, or just about 1:00 PM (11:00 UT), Friday, March 30, 70 AD. But, the astronomical conjunction fell at 11:46 PM (21:46 UT) Jerusalem time that same day, on Friday evening.

**Once again, we have a coincidence of the conjunction, molad calculation, and Hebrew Calendar dates, all falling on the same day by 12:00 noon rule, as the Hebrew Calendar declared Saturday, March 31, 70 AD, Nisan 1.** So, as stated previously, sometimes the lunar phase is finitely matched to the lunar date, but often it is not, being determined by fixed averaging of set lengths of 29 or 30 days. Neither Jesus Christ, nor the apostles, nor the early New Testament church took issue with these known methods of lunar calendar declarations.

Thus, the Hebrew Calendar of 70 AD utilized a method of calculation that permanently fixed the length of certain lunar months by a set number of days. **The first six months of the year from Nisan through Elul were fixed at 29 or 30 days, regardless of molad averaging, calculations, astronomical conjunctions, star charts or the appearance of the first visible crescent moon at Jerusalem.** The eighth and ninth lunar months were made variable between 29 or 30 days, according to fixed rules of calculation, but all other months were permanently assigned either 29 or 30 days every year.

We have reconstructed the six-month period of 177 days from Trumpets, 70 AD back to Nisan 1, 70 AD. Now we shall tackle the remaining 207 days of civil year 3830 from Tishri 1 to Nisan 1, 69 AD. This task will be relatively easy. The spring of 70 AD was intercalated, since civil year 3830, 69 AD was the 11th year of the 3, 6, 8, 11, 14, 17 and 19 year intercalary cycle. Thus, a thirteenth month was added between the months of Shevat and Adar—a second Adar named Adar I. The original Adar is now named Adar II. As we are dealing with a common leap year of 384 days, and as this period has 177 days + 30 days for a total of 207 days, the months are averaged in a rotating 29/30/30/29/30/29/30 day fashion. Thus Adar II has 29 days, Adar I has 30 days, Shevat has 30 days, Tevet has 29 days, Kislev has 30 days, Heshvan has 29 days and Tishri has 30 days.

We will now focus our attention on 5 BC, the year of Jesus' birth. Once again we will examine evidence that 5 BC was a leap year in the 3, 6, 8, 11, 14, 17 and 19 year intercalary cycle. Once it is demonstrated that the year of Jesus' birth was indeed a leap year, we will have a 5 BC to 66 AD to 70 AD lock on a 76-year intercalary cycle nestled in 4 19-year luni-solar cycles. As we proceed we will examine the debates that centered on which molad was the epochal molad, and examine as well the calendar according to Herman L. Hoeh and Frank W. Nelte. After examining the significance of this material we will examine calendar mathematics after which we will begin the detailed reconstruction of the *Calendar of Christ and the Apostles* from 5 BC to 70 AD.

# Chapter Four

## Trumpets 5 BC
## Civil Year
## 3757

The Jewish historian Josephus records that a great autumnal eclipse of the moon occurred a few months before the death of Herod the Great, who died in February 4 BC. This lunar eclipse thus occurred in the fall 5 BC*.

> But the people, on account of Herod's barbarous temper, and for fear he should be so cruel and to inflict punishment on them, said what was done was done without their approbation, and that it seemed to them that the actors might well be punished for what they had done. But as for Herod, he dealt more mildly with others [of the assembly] but he deprived Matthias of the high priesthood, as in part an occasion of this action, and made Joazar, who was Matthias's wife's brother, high priest in his stead. Now it happened, that during the time of the high priesthood of this Matthias, there was another person made high priest for a single day, that very day which the Jews observed as a fast [Day of Atonement]. The occasion was this: This Matthias the high priest, on the night before that day when the fast was to be celebrated, seemed, in a dream, to have conversation with his wife; and because he could not officiate himself on that account, Joseph, the son of Ellemus, his kinsman, assisted him in that sacred office. But Herod deprived this Matthias of the high priesthood, and burnt the other Matthias, who had raised the sedition, with his companions, alive. **And that very night there was an eclipse of the moon** (Josephus, *Antiquities of the Jews*, 17:6:4).

The only lunar eclipse recorded for the fall of 5 BC occurred on the evening of September 15 (Liu and Fiala, *Canon of Lunar Eclipses: 1500 BC—AD 3000*, p. 89). Astronomers inform us that this total eclipse began at 8:33 PM (17:33 UT) Jerusalem time, Friday evening, September 15, 5 BC and ended at 2:09 AM (23:09 UT) Jerusalem time, Saturday morning, September 16, 5 BC.

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* For detailed evidence of the dates of Herod's death and the birth of Christ see *A Harmony of the Gospels* by Fred R. Coulter.

Now some will insist that there was no such lunar eclipse in 5 BC and that astronomers inform us instead that the above eclipse occurred in 4 BC. In citing the above reference for example, they will make note of the fact that the above eclipse is listed for 4 BC. However, 4 BC in the Canon of Liu and Fiala is actually 5 BC as they utilize a year "0" in their dating system. Notice the declaration of their dating convention at the beginning of the book:

> Dating convention used for this Canon. This work contains all lunar eclipses between 1501 BC and AD 3015. Before the Christian era, the years are designated in the Astronomical System, i.e., the year 0 corresponds to 1 BC and the year –1 to 2 BC, etc.

A Hebrew Calendar, using an intercalary sequence of 3, 6, 8, 11, 14, 17 and 19, informs us that the High Sabbath of the Feast of Tabernacles occurred on September 16 that year, thus matching the historical and astronomical data, as Josephus records that this eclipse occurred shortly after the Day of Atonement. Trumpets, September 2, 5 BC also begins the 14th year of the 19-year cycle, which also happens to be the 5th intercalary year of that cycle.

To some it may appear that Josephus places the date of this eclipse at the time of the Day of Atonement. This is not true, and is simply the case of a misplaced antecedent:

> Now it happened, that during the time of the high priesthood of this Matthias, there was another person made high priest for a single day, that very day which the Jews observed as a fast [Day of Atonement]. The occasion was this: This Matthias the high priest, on the night before that day when the **fast was to be celebrated [Day of Atonement],** seemed, in a dream, to have conversation with his wife; and because he could not officiate himself on that account, Joseph, the son of Ellemus, his kinsman, assisted him in that sacred office [Day of Atonement]. But Herod deprived this Matthias of the high priesthood, and burnt the other Matthias, who had raised the sedition, with his companions, alive. **And that very night there was an eclipse of the moon [the night Herod deprived Matthias of the high priesthood, and burnt the other Matthias—not the night of the Day of Atonement]** (Josephus, *Antiquities of the Jews*, 17:6:4).

It is also a fact of astronomy that eclipses cannot occur on the 10th day of a lunar month. So, there can be no question that this eclipse was not on the eve following Atonement.

However, proponents of an intercalary cycle of 2, 5, 7, 10, 13, 16 and 18 place the High Sabbath of Tishri 15, 5 BC on October 16, 5 BC, thus missing the historical, astronomical and calendrical facts by one full month!

Since Trumpets, 5 BC began the 14th year of the cycle, a leap year, and since Josephus, the Hebrew Calendar, and astronomers declare the seventh month in September and not October, once again, the believers of the 2, 5, 7, 10, 13, 16 and 18 year pattern have nothing to stand on to justify their belief for 5 BC. These intercalary patterns run in cycles of 19-years that occur century after century in an unbroken chain. If the cycle is off in one leap year it will be off in every leap year and must be discarded—this is exactly the case of the 2, 5, 7, 10, 13, 16, and 18 year intercalary pattern.

We now have an iron grip lock on four very important dates in history (5 BC, 66 AD, 69 AD and 70 AD), which agree perfectly with the declarations of a Hebrew Calendar utilizing an intercalary sequence of 3, 6, 8, 11, 14, 17 and 19. As we demonstrated for calendric years 66-70 AD, the above intercalary pattern from Trumpets 5 BC to Trumpets 70 AD must also be valid or the Hebrew Calendar would not match any of the verifiable date links of history. However, all historical dates and Hebrew Calendar declarations agree in perfect harmony! We have a calendric lockdown for a period of 76 years covering the birth of Christ in 5 BC, through Christ's ministry, the early apostolic era and the destruction of the Jewish Temple in 70 AD!

A Hebrew Calendar utilizing an intercalary sequence of 3, 6, 8, 11, 14, 17 and 19 declares leap years for 5 BC, 66 AD and 69 AD. Therefore, the pattern of declared leap years falling between these benchmark dates must be accepted as valid. The reason? **If any leap year length were changed by one day; i.e., adding a day (making the year too long) or subtracting a day (making the year too short), or if the pattern of the year lengths or the pattern of intercalation were changed in any way, the calendar would not agree with the facts of history.**

A reconstruction of the 19-year cycles and their attendant intercalary sequences is given later in this paper for this entire period. But before we get to this reconstruction of the calendar of Christ, we must address the issue of the debate of the date of creation. It is a gross misunderstanding and misapplication of this argument that led our modern-day church leaders to

accept not only a 2, 5, 7, 10, 13, 16 and 18 year intercalary pattern with the wrong 19-year cycle dates, but also a 31 AD crucifixion date for Christ.

# Chapter Five

## The Debate
## Over the Epochal Molad of Creation

A philosophical debate within the rabbinic community concerning the year of creation broke out sometime after the debacle of Bar Kokhba*. This debate did not subside until about 1000 AD or so when it was finally accepted that 3761 BC was the year of creation. However, different conclusions of acceptance as to when time began does not alter Hebrew Calendar dates.

The 19-year cycle is entirely dependent on a conclusion as to when time began. For instance, Trumpets 1996 to Trumpets 1997 in our current era was the last year of a 19-year time cycle. This determination is based on the current acceptance that time actually began in the year 3761 BC and that year 1 of the first 19-year cycle began in 3761 BC.

Now the Hebrew Calendar works in 19-year cycles in which are imbedded 7 years in which an extra month is added to the end of the year. This adding of a second Adar of 30 days is known as intercalation. The assumed beginning date of the first of these 19-year cycles is 3761 BC, the date accepted by Jews as the date of creation. The current cycle or pattern of these years of intercalation is years 3, 6, 8, 11, 14, 17 and 19 of each cycle.

Current Hebrew Calendar calculations are based on this widely accepted date for creation—3761 BC. This assumed creation date gives us a pattern of 13-month leap years of 3, 6, 8, 11, 14, 17, and 19. Rolling forward in time by 19-year increments, 1996-1997 AD should be year 19 of the 19-year cycle 1978-1996 AD, and thus a leap year (a second Adar is added in the spring of 1997).

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* Bar Kokhba led a failed rebellion against the Roman Empire beginning 132 AD.

An assumed creation year of 3760 BC yields an intercalary pattern of years 2, 5, 7, 10, 13, 16, and 18. An assumed creation year of 3759 BC gives us an intercalary pattern of years 1, 4, 6, 9, 12, 15, and 17 and an assumed creation year of 3758 BC yields an intercalary pattern of years 3, 5, 8, 11, 14, 16 and 19.

The belief that man was created in the year 3761 BC dates back to the second-century AD but did not gain acceptance until the middle ages. The Babylonian Talmud ascribes its origin to rabbi tanna Yose b. Halafta who first wrote of it in the *Seder Olam Rabbah* as noted by the *Encyclopaedia Judaica*:

> *Seder Olam* is mentioned in the Talmud (Shab. 88a; Yev. 82b; et al.) and is ascribed by the Palestinian *amora* R. Johanan (third century) to the second-century *tanna* Yose b. Halafta (Yev. 82b; Nid. 46b). The work is divided into three parts, each consisting of ten chapters. Part one enumerates the dates of major events from the creation of the world until the death of Moses and the crossing of the Jordan by the Israelites under Joshua; part two, from the crossing of the Jordan to the murder of Zechariah, king of Israel; part three, chapters 21–27, from the murder of Zechariah to the destruction of the Temple by Nebuchadnezzar; and chapter 28, from the destruction of the Temple to the conquest of Babylon by Cyrus. Chapter 29 and the first part of chapter 30 cover the Persian period, which is stated to be only 34 years. (s.v. “Seder Olam Rabbah”).

Based on his chronological studies, rabbi Yose believed the date of creation was 3828 BC. The figure of 3761 BC is derived by subtracting 68 (the date rabbi Yose believed the second temple was destroyed) from 3828 resulting in 3760. One year must be added to 3761 due to the fact there is no year “0.”

The publication

> *Seder Olam Rabbah* was the first to establish the era "from the creation of the world" (*ab creatione mundi*, abbreviated A.M. for *anno mundi*). Utilizing the biblical chronology and reconstructing post-biblical history as well as he could, the author arrived at the conclusion that the world was created 3828 years before the destruction of the Second Temple by the Romans. According to this calculation the destruction took place in the year 68, which is in contradiction to the accepted chronology that it took place in the year 70 C.E. An attempt to harmonize the contradiction was made by E. Frank (see bibl.). It was a long time

until the reckoning according to the *anno mundi* era took root in Jewish chronology. For many centuries the calculation of the *Seder Olam Rabbah* was of interest only to talmudic students who tried to satisfy their curiosity for historical reconstruction. The usual calculation accepted by Jews in talmudic and even post-talmudic times was that of the Seleucid era, beginning with the year 312 BCE., and usually referred to in Jewish literature as *minyan shetarot* ("dating of documents"). Only when the center of Jewish life moved from Babylonia to Europe and the calculation according to the Seleucid era became meaningless was it replaced by that of the *anno mundi* era of the *Seder Olam*" (Ibid., s.v. "Seder Olam Rabbah").

Had rabbi Yose not mistakenly compressed the Persian Period from 207 years to a mere 34 years, his date of creation would be been extended by those years to 3968 BC.

Yose b. Halafta believed that the date of creation was 3761 BC while other rabbis did not. This lead to

Apparent variations in the *ordo intercalationis*, i.e., …(2, 5, 7, 10, 13, 16, 18), …(1, 4, 6, 9, 12, 15, 17) and…(3, 5, 8, 11, 14, 16, 19) by the side of the present order (3, 6, 8, 11, 14, 17, 19), which are met with as late as the tenth century, are but variant styles of the selfsame order. These are in part also indicated by the epochal *molad* variously given as (…4d. 20h. 408p.), … = 2d. 5h. 204p., … = 6d. 14h. 0p. and … = 3d. 22h. 876p. which artificially go back to the beginning of the Era of the Creation [first espoused by rabbi Yose] and variously place its epoch in the autumn of 3762,–61,–60,–59 and–58 BCE. respectively (see Chronology). While it is not unreasonable to attribute to Hillel II the fixing of the regular order of intercalations, his full share in the present fixed calendar is doubtful (Ibid., s.v. "Calendar").

**YOSE BEN HALAFTA** (mid-second century C.E.), *tanna*; the R. Yose mentioned in the Talmud without patronymic. Yose was one of the leaders of the generation after the persecutions which followed the Bar Kokhba War. He was born in Sepphoris, where his father was one of those who instituted *takkanot* there after the destruction of the Temple (Tosef., Ta'an. 1:14). Yose studied under his father and transmitted some of his teachings (Kelim 26:6; et al.). He also studied under Johanan b. Nuri in Galilee (Tosef., Kelim, BK 6:4; et al.), and under Tarfon in Judea (*ibid.*, Shev. 4:4). **His main teacher, however, was Akiva** in whose name he frequently transmits *halakhot*, and it was said generally: "R. Akiva his teacher" (Pes. 18a). He is numbered among his last pupils who "reestablished the Torah" (Yev. 62b) and were ordained by Judah b. BAba (Sanh. 14a). During the persecutions he endangered his life to fulfill the precept of circumcision and fled to Asia or to Laodicea (BM 84a: TJ, Ab. Zar. 3:1). **He participated in all the conventions of scholars "at the close of the period of persecution," in the valley of Bet Rimmon,** in Usha, and in Jabneh (TJ, Hag. 3:1; Ber. 63b). He

followed in the footsteps of his father in Sepphoris in introducing *takkanot* (Sanh. 19a), in giving practical instruction (see Er. 86b), and in preaching in public (Sanh. 109a).

Yose's *bet din* in Sepphoris was reckoned among the most outstanding in Erez Israel (Sanh. 32b). It is probable that after Nathan and Meir were demoted from the leadership in the Sanhedrin, following their attempt to remove Simeon b. Gamaliel from his office as *nasi* (Hor. 13b), he and Judah took their places, since they are frequently found together with the *nasi*, both at Usha and during his various trAbels (Tosef., Ber. 5:2; *ibid.*, Suk. 2: 2; et al.), and Simeon b. Gamaliel quotes him (Meg. 6b). His influence was still felt in the council chamber during the time of Judah ha-Nasi, the son of Simeon, who withdrew his own view in fAbor of that of Yose (Shab. 51a), and spoke of him with exceptional respect (Git. 67a). Judah ha-Nasi also incorporated some of the Mishnah of Yose into his Mishnah; this is especially noticeable in the tractate *Kelim*. In fact the *halakhah* was established in accordance with the view of Yose wherever his associates disagreed with him (Er. 46b). Yose is mentioned several times in all the tractates of the Talmud with the exception of *Bikkurim*, *Hagigah*, *Horayot*, and *Me'ilah*, and in the *beraitot* his *halakhot* are frequently given.

His sayings in the *aggadah* are not numerous; some 16 of his conversations with gentiles have been preserved, especially those with "a certain matron." Many of his aggadic sayings deal also with theological and cosmological problems, and noteworthy in this connection is his explanation of the name *Makom* ("place") for God: "The Holy One is the place of the world, but the world is not His place" (Gen. R. 68:9). Among others are his sayings: "The Divine Presence never descended to earth, nor did Moses and Elijah ever ascend on high" (Suk. 5a); "On what does the world rest? On the pillars... the pillars upon the waters... the waters upon the mountains... the mountains on the wind... the wind upon the tempest... the tempest is suspended on the arm of the Holy One" (Hag. 12b). In opposition to the view of others, Yose held that "man is judged each day" (Tosef., RH 1:13). Yose transmitted many reminiscences and historical traditions of the generations close to him and of the time of the Temple. In his *aggadah* too an important place is given to determining the chronology of the events in Scripture and to the interpretation of the historical material of the scriptural books. The *baraita*, *Seder Olam*, dealing with chronology, had its origin in his school, as testified by Johanan (Yev. 82b). Many traditions record his unpretentious ways and his relations with his fellow men, as well as his piety (Shab. 118b; TJ, Ber. 3:4). Yose is the first scholar of whom it is related that he was worthy of hAbing the prophet Elijah reveal himself to him regularly in order to teach him (Ber. 31; et al.). Of his private life, it is known that he obtained his livelihood by tanning (Shab. 49a–b). He left five sons, all scholars, the best known of them being Ishmael and Eleazar.

As the author of the above article for the *Encyclopaedia Judaica* states, these are apparent, not actual variations on the selfsame order. That is, they

represent different scholarly views on the date of creation "…3762,–61,–60,–59 and–58 BCE," but not differing views on the pattern of intercalation.

The *Encyclopedia Judaica*, Vol. 5 lists several optional patterns that have been used throughout history, depending on differing opinions as to when time began. Looking at the chart below you will see something obvious. Even though the patterns are different (i.e., 2, 5, 7, 10, 13, 16, 18 etc.) the X's all line up perfectly on a running time line—proving that this debate has nothing at all to do with moving the declaration of the holy days to a different day or month, but is simply a philosophical exchange about which years of the time cycle are intercalated based on an agreement as to when time supposedly began.

For instance, if we believe that time began in 3759 BC, year 17 of the 19-year time cycle is a 13-month year. Look directly above year 17 of 3759 and you will see that the identity of the year changes to year 18 for 3960, and directly above that, the identity changes to year 19 for 3761 BC, if we believe time began in that year. Match any year of the first three lines to the same year in the second set below. Follow a straight line from any one of the three years in the top set to the same year in the lower set, and watch the numbered year of the 19-year cycle change in the transition from one to the other. The conclusion is obvious, as indicated by the straight line of X's for leap years. The point is that there is not so much as a hair's width or budge in the day of the declaration of Trumpets for a given year of the time line, regardless as to whether time began in 3761, 3760, 3759 or 3758 BC.

The debate over the year of creation has to do with the issue of the intercalation patterns which determine the identity or number sequences of leap years within the 19-year time cycle. Unfortunately some modern day calendar technicians have picked up on something from calendar antiquity that is little more than a philosophical debate as to when time actually began, and have interpreted this debate in a literal sense as a means of using leap year patterns in such a way as to actually modify the declarations of the Hebrew Calendar. To illustrate this fact consider the following chart:

| 3761 BC | 3760 BC | 3759 BC | 3758 BC | Intercalary cycle Common to All |
|---|---|---|---|---|
| 1 | | | | |
| 2 | 1 | | | |
| 3 | 2 | 1 | | X |
| 4 | 3 | 2 | 1 | |
| 5 | 4 | 3 | 2 | |
| 6 | 5 | 4 | 3 | X |
| 7 | 6 | 5 | 4 | |
| 8 | 7 | 6 | 5 | X |
| 9 | 8 | 7 | 6 | |
| 10 | 9 | 8 | 7 | |
| 11 | 10 | 9 | 8 | X |
| 12 | 11 | 10 | 9 | |
| 13 | 12 | 11 | 10 | |
| 14 | 13 | 12 | 11 | X |
| 15 | 14 | 13 | 12 | |
| 16 | 15 | 14 | 13 | |
| 17 | 16 | 15 | 14 | X |
| 18 | 17 | 16 | 15 | |
| 19 | 18 | 17 | 16 | X |
| 1 | 19 | 18 | 17 | |
| 2 | 1 | 19 | 18 | |
| 3 | 2 | 1 | 19 | X |

For instance, if we believe that time began in 3759 BC, year 17 of the 19-year time cycle is a 13-month year. Look directly opposite year 17 of 3759 and you will see that the identity of the year changes to year 18 for 3760, and directly opposite that, the identity changes to year 19 for 3761 BC, if we believe time began in that year. Match any year of the first three lines to the same year in the second and third column. Follow a straight line across any one of columns, and watch the numbered year of the 19-year cycle change in the transition from one to the other. The conclusion is obvious, that there is not so much as a hair's width or budge in the day of the declaration of Trumpets for a given year of the time line, regardless as to whether time began in 3761, 3760, 3759 or 3758 BC.

The Hebrew Calendar year beginning Tishri 1, 1997 was civil year 5758, and was based on the assumption that time began in 3761 BC. If we believed that time began in 3760 BC, then the Hebrew date was 5757 and it would have been year 18—not 19 that was intercalated. But, these different ideas do not affect the declaration of Trumpets. To be completely ridiculous, but to really make the point, we could decide to take the birthday of Uncle Bill's first cousin, twice removed, and multiply that date by 4,623—then take the square root of the answer and call that the identity of the year 1996-97. Trumpets would still be declared on Thursday, October 2 in that year. We can call that year the 17th, 18th, or 19th--or year 57 of a 438 year cycle. It just doesn't matter...the day of Trumpets would still begin at the same moment in time.

This philosophical theory, which identifies a 19-year cycle as having begun in 3761 BC, was in use at the birth of Jesus and throughout His lifetime. It was still in use at the destruction of Jerusalem, 70 AD. Neither Christ nor His apostles objected to its use!

It is important to understand that Hoeh and Nelte are incorrectly applying leap year sequences for years that are dated AD. When they utilize a 3760 BC 2, 5, 7, 10, 13, 16, and 18 year sequence in their calculations, they actually equate year 2 of the cycle to 3 AD instead of 4 AD, thus replacing the 3, 6, 8, 11, 14, 17 and 19 year sequence all together. Both cycles should correspond to 4 AD and end with 20 AD. In this manner the AD leap year sequence is bumped up one year from 4 to 3 AD. The following charts will illustrate this point. The “Cycle Year” equates to the year of the 19-year cycle. Each “X” marks which year in that 19-year cycle has 13 months:

# A
# 3761 BC

## 3, 6, 8, 10, 11, 14, 17, 19
## Leap Year Sequence

| Year AD | Cycle Year | Intercalary Sequence |
|---|---|---|
| 2 | 1 | |
| 3 | 2 | |
| 4 | 3 | X |
| 5 | 4 | |
| 6 | 5 | |
| 7 | 6 | X |
| 8 | 7 | |
| 9 | 8 | X |
| 10 | 9 | |
| 11 | 10 | |
| 12 | 11 | X |
| 13 | 12 | |
| 14 | 13 | |
| 15 | 14 | X |
| 16 | 15 | |
| 17 | 16 | |
| 18 | 17 | X |
| 19 | 18 | |
| 20 | 19 | X |

Notice that the 1st year of the leap year sequence equates to 4 AD and so on down to the 7th year of the leap year sequence which equates to 20 AD.

# A
# 3760 BC Cycle

## Grafted onto a 3761 BC Cycle
## 2, 5, 7, 10, 13, 16, and 18
## Leap Year Sequence

| Year AD | Cycle Year | Intercalary Sequence |
|---|---|---|
| 2 | 1 | |
| 3 | 2 | X |
| 4 | 3 | |
| 5 | 4 | |
| 6 | 5 | X |
| 7 | 6 | |
| 8 | 7 | X |
| 9 | 8 | |
| 10 | 9 | |
| 11 | 10 | X |
| 12 | 11 | |
| 13 | 12 | |
| 14 | 13 | X |
| 15 | 14 | |
| 16 | 15 | |
| 17 | 16 | X |
| 18 | 17 | |
| 19 | 18 | X |
| 20 | 19 | |

Notice that the 1st year of the leap year sequence on this chart equates to 3 AD, not 4 AD and so on down to the 7th year of the leap year sequence which equates to 19 AD, not 20 AD.

As we have just seen, differing years have been advanced over the millennia as the actual year of creation (the *Epochal Molad*). These dates are obviously fictitious. However they in no way invalidate the accuracy of

the calculated calendar declarations. Why, we might ask? The answer is that through all those years the pattern of intercalation has never changed. Only the leap year numbers have changed to match the year BC that was considered Tishri one, year one (3761, 3760, 3759 BC etc.). The reason this is true will now be examined.

This has never been an issue about changing leap year patterns to correct for seasonal drift in declarations, but a debate about when time began, and that, and that alone, determines the pattern of number intercalation. Changing the leap year pattern of the calculated calendar will always result in re-defining the date of creation, and vice versa.

Stated in simple terms, when we speak of the 19-year cycle some reference point is obviously inferred. No Hebrew Calendar scholar would ever be so foolish as to overlook this fact, yet some in the Church of God today are suggesting that we can just decide to move leap year patterns around at random to effect a seasonal adjustment.

True, when the Calendar Court still functioned before about 360 AD, a one time decision could be made in a given year to declare a normal 12 month year to be 13 or vice versa. This was done in the event of famine, local disasters, or conditions of hardship that could be elevated by changing declarations for that one-year. Those responsible would then have to put declarations back in synchronization with long standing rules in the years that followed.

These types of adjustments were temporary. Any long-term decisions about calendar intercalation patterns must always be done with a reference to creation date, even though it's obvious that any such stated date is purely a guess. This has always been the primary issue (i.e., creation date) in this debate. Hebrew Calendar scholars maintain that a permanent change to the pattern of intercalation has never been implemented to address a seasonal correction to the declaration of the festival days.

Please understand that the declaration of the feast days by the Hebrew Calendar have never been modified or altered by this philosophical debate about when time began. This is not a question of moving time around by 30-day increments, but merely hanging a label on the numbered identity of a year within a 19-year time cycle. Unfortunately some have tried to add or subtract months within certain years to propose a "fix" for seasonal drift, or

to force holy days to fall on a certain days of the week (see Chapter Twelve, "The Impossibility of a Wednesday Passover in 31 AD"). We have no hard evidence that the Hebrew Calendar has ever employed such methods. In fact, it is mathematically and astronomically impossible to do so.

What the Hebrew Calendar people who move days and months around have done is to simply redefine the numbered identity of the leap years within the 19 year time cycle. This is strictly a transparent, "on paper" re-naming of a numbered month, day, and time cycle year, with nothing taking place in the literal movement of calendar declarations with respect to time. That is to say that Tishri 1 always begins at the same moment in time no matter what label as to numbered month, day, or year man has chosen as an identity.

While it is true that due to the lunar/solar drift, we are now observing some of the holy days some 8 to 9 days later in the harvest cycle as compared to the time of Christ, no attempt has ever been made to fix this by literally moving the declaration of the feast days to different months by changing leap years. These declarations have always stayed where they are, but at times the identity of the number of the cyclical year has been changed to suit the fancy of the calendar Rabbis in power at the time. It's sort of like the disclaimer on the old Dragnet series..."these are true declarations, but the names (i.e., of leap years) have been changed to protect the Rabbi's opinion as to when time began!" A thousand years or so from now something would have to be done in order to keep the feasts within the Jerusalem harvest cycle. But, currently this is not a problem.

We have demonstrated through the testimony of three historical witnesses that intercalary cycle with years 2, 5, 7, 10, 13, 16, and 18 was never used. This cycle was never used as the basis for the Hebrew Calendar, no not before the time of Christ, not at the time of Christ, nor after the time of Christ. Only cycle 3, 6, 8, 11, 14, 17 and 19 has proven to be consistent with the witness of history and has been consistently used throughout history.

How then did intercalary cycle 2, 5, 7, 10, 13, 16, and 18 emerge from the pack of five hotly debated intercalary cycles as the only true cycle before the third century AD? And when did it replace intercalary cycle 3, 6, 8, 11, 14, 17 and 19 in calendar calculations for that period? And, how is it that this cycle actually changes dates of declaration for Trumpets by a month? Haven't we just demonstrated that these cycles were merely different

philosophical views of the creation of man and thus equated to the same intercalary pattern?

As we have demonstrated intercalary cycle 3, 6, 8, 11, 14, 17 and 19 with a beginning date of creation of 3761 BC was used throughout the period of debate and was not replaced by a single other cycle advanced during that period. The shocking truth is that intercalary cycle 2, 5, 7, 10, 13, 16, and 18 with a beginning date of creation of 3760 BC did not replace intercalary cycle 3, 6, 8, 11, 14, 17 and 19 until the 1960's. And, not only on paper as part of a philosophical debate about the creation of man, but for the first time since Ezra structurally built into the calculations of the Hebrew Calendar

A fundamental misunderstanding has prevailed for decades that the pattern of intercalation was altered sometime in either the second or third century AD; or, that our current cycle of years 3, 6, 8, 11, 14, 17 and 19 was either not utilized by Hillel II because it was not universally accepted until around 1000 AD and therefore not utilized until that time. Or, that it was implemented by Rabbi Samuel in 250 or 255 AD. The implication being that any one of five different cycles was utilized in calendar calculations before 1000 AD, including Hillel II. The assumption that the above cycle was not used before 1000 AD is false. As we demonstrated in this paper, intercalary cycle 3, 6, 8, 11, 14, 17 and 19 has been consistently used since the beginning.

Now, the truth is, no such pattern shift ever occurred nor could it have occurred! Nevertheless, some writers point to 142 AD or 161 AD or 225 AD or 256 AD as possible dates for this modification. Except for the fact that the assumed modification of either 142 AD or 256 AD is built into our current calendar calculations, it matters not which date is chosen.

We will look at the mythical shift in the second and third centuries with its bogus intercalary cycle 2, 5, 7, 10, 13, 16 year.

# Chapter Six

## The Calendar
## According to Herman L. Hoeh

On Friday, April 20, 1973, Dr. Hoeh gave a landmark Bible Study at Ambassador College entitled "A New Look at Pentecost in Light of the Calendar Adjustment in the Second Century." This Bible Study was subsequently written up in article form under the same title and published by Richard Nickels.

A great controversy over whether Pentecost was on a Sunday or a Monday was raging at this time. Dr. Earnest Martin had left the fellowship of the Worldwide Church of God the year before, taking a good many brethren with him. Dr. Martin, of course, believed and preached that Pentecost should be observed on Sunday, not Monday. Dr. Charles Dorothy was assigned the task of researching the issue and hopefully settling the matter once and for all. His research, which supported a Sunday Pentecost observance, was completed during the days of Unleavened Bread 1974. Herbert W Armstrong accepted Dr. Dorothy's conclusions and subsequently declared that based on the evidence, Pentecost should be observed on Sunday not Monday. This research was then published in booklet form and sent to the ministry to explain the change to the membership.

While Pentecost is not the focus of this paper, the Hebrew Calendar Dr. Hoeh utilized in an attempt to demonstrate that Pentecost should be observed on a Monday, is of great interest to us. We are particularly interested in Dr. Hoeh's assertion that the intercalary cycle of the calendar of Jesus' day was different than the cycle we use today and was therefore adjusted sometime in the distant past. Based on this assertion he sets out to determine when and why the adjustment was made.

In support of his assertion that the intercalary cycle has been adjusted he sites the following as evidence:

> The year of the crucifixion, AD 31,[3] was intercalary[4] and Passover of that year occurred, according to the sacred calendar, on Wednesday, April 25, not a Monday, March 26, the fourteenth day of the previous month. Now jump to our day. The year 1931 is one hundred 19-year cycles from AD 31, so it, too, one might expect, would be intercalary. Yet the year 1931[5]was not intercalary by the calendar the Jews use today. Why not? The answer is that *the sacred calendar was adjusted*.
>
> ---
>
> **Note 3** Spring of AD 31 was the 10th year of the 19-year cycle, which began in the fall of AD 30 and had 385 days.

The intercalary cycle that generates a crucifixion date of AD 31, and thus a year of intercalation for that year, is a 2, 5, 7, 10, 13, 16 and 18 year cycle. 31 AD is the 10th year of that 19-year cycle. Dr. Hoeh thus introduces as the foundation of his evidence, an intercalary cycle he neither identifies, nor for which he gives any evidence in support, but uses as evidence in support of his argument. Nowhere in the paper does he demonstrate that this indeed is the cycle of the time of Jesus. On this unproven assertion he argues that one hundred 19-year cycles later in 1931 AD, the year is not intercalated, and, Volia'—evidence that the cycle was adjusted. This is classical circular reasoning.

Obvious questions now arise, "who made the adjustment, what was adjustment, when did this supposed adjustment occur, and why was the adjustment made?"

Without giving any source, Dr. Hoeh answers the "who" in the first paragraph under the subheading The Year of Adjustment. The person responsible for the adjustment, we are told, is Simon III.

> In the Patriarchate of Simon III, between AD 140 and 163, a great controversy arose pertaining to the intercalary years and the Holy Days. As we count it, Pentecost would have fallen, for the first time in summer, June 23, 161 AD[7]

With a little sleuthing, we learn that the source of the assertion that Simon III made the adjustment is an article written by Cyrus Adler for The Jewish Encyclopedia, Funk & Wagnalls, 1902, Vol. 3, Page 500. As we can readily see, Dr. Hoeh's comments are a paraphrase of this quote:

> Under the patriarchate of Simon III. (140-163) a great quarrel arose concerning the feast-days and the leap year, which threatened to cause a permanent schism between the Babylonian and the Palestinian communities-a result which was only Aberted by the exercise of much diplomacy.

Nowhere in Adler's article is it stated or even inferred that Simon III adjusted the intercalary cycle. Yet Dr. Hoeh draws the conclusion from the short statement by Adler that the intercalary cycle was changed. Notice Dr. Hoeh's comments to this regard a little later in his article:

> In AD 161, if the calendar used at Jesus' time had not been adjusted by Simon III, a Monday Pentecost would have been observed on the beginning of summer. The Jewish Patriarch Simon III imposed a needed postponement of the intercalated year from the seventh year (AD 161) to the eighth year.[8]
>
> Simon III determined this calendar postponement not according to the Pharisees' Sivan 6 Pentecost, but by a true Monday Pentecost. This was a controversial decision. Simon III knew how Pentecost was originally counted.

Dr. Hoeh footnotes the very first of the Simon III references with comments not made at the time of the original Bible Study in 1973, but added many years later at the behest of Richard Nickels. In footnote 7 he writes:

> In the Patriarchate of Simon III, between AD 140 and 163, a great controversy arose pertaining to the intercalary years and the Holy Days. As we count it, Pentecost would have fallen, for the first time in summer, June 23, 161 AD[7]
>
> > **Note 7** The pattern of common years and leap years in any 19-year cycle results in the Hebrew solar-lunar calendar being slightly ahead or behind sun time. This is normal variation. **In the pattern of intercalary years used in Jesus' day, years 2, 5, 7, 10, 13, 16, and 18 of a 19-year cycle were intercalary**. In a 19-year cycle with that pattern, Passover would be earliest (with respect to the spring equinox) in the fifteenth year of the cycle and the latest in the seventh. The accumulated variation in the Hebrew calendar (one day in 216 years) would be most serious in the seventh year of the 19-year cycle, when Pentecost would tend to be pushed closest towards summer. During the jurisdiction of Simon III, the spring of the seventh year of the 19-year cycle occurred in AD 142 and again in AD 161. With no change in the pattern of leap years, Pentecost was on Monday, June 19 in 142. But in 161, with Pentecost on a Monday, it would have been on June 23.

Even though Dr. Hoeh never proffers any evidence in support of an intercalary cycle of years 2, 5, 7, 10, 13, 16, and 18 of a 19-year cycle at the time of Jesus, he now emphatically states this indeed was the cycle. Returning to the second reference to Simon III for a moment, notice that he asserts that Simon adjusted this cycle by moving the 7th year intercalation to the 8th year:

> In AD 161, if the calendar used at Jesus' time had not been adjusted by Simon III, a Monday Pentecost would have been observed on the beginning of summer. The

> Jewish Patriarch Simon III imposed a needed postponement of the intercalated year from the seventh year (AD 161) to the eighth year.[8]

He goes on to footnote this second reference to Simon III as follows:

> **Note 8 The cycle during transition was 2, 5, 8, 11, 14, 17, 19 and then the cycle thereafter continued as we have today: 3, 6, 8, 11, 14, 17, 19 (except when certain festivals fell too early).** Beginning in AD 167 we have the first evidence of controversy over the earliness of the Passover in the Christian community, in the writing of Melito of Sardis, titled *On the Passover*. The Jews were accused by some of observing Passover too early. Before AD 70, however, Passover was never observed at the beginning of spring, but always after the beginning of spring; hence, the adjustment in this time period.

So, we are led to believe that the original intercalary cycle at the time of Jesus was years 2, 5, 7, 10, 13, 16, and 18 of a 19-year cycle. This cycle was then adjusted in 161 AD by Simon III to a cycle of years 2, 5, 8, 11, 14, 17, 19.

Whoops, how did we transition from an original cycle of:

years 2, 5, 7, 10, 13, 16, and 18

to a cycle of

years 2, 5, 8, 11, 14, 17, and 19?

Simon III, we are told, merely adjusted year 7 of the cycle to year 8. Who then adjusted year 10 of the original cycle to year 11? Who then adjusted year 13 of the original cycle to year 14? Who then adjusted year 16 of the original cycle to year 17? And, who then adjusted year 18 of the original cycle to year 19?

Furthermore, how did Dr. Hoeh retrieve so much information on Simon III and these asserted adjustments from an article that never discussed the original intercalary cycle, yet alone list the years of that cycle; never discussed a change by Simon III in which he cancelled intercalary year 7, 161 AD and postponed it to year 8, 162 AD; and, never discussed a transition from a cycle years 2, 5, 7, 10, 13, 16, and 18 to a cycle of years 2, 5, 8, 11, 14, 17, and 19.

Last but not least, who adjusted cycle:

2, 5, 8, 11, 14, 17, and 19

to

3, 6, 8, 11, 14, 17, and 19?

Who adjusted cycle year 2 to year 3? And, who adjusted cycle year 5 to 6?

When John Kossey published his book *The Hebrew Calendar: A Mathematical Introduction*, he refers to the same article written by Adler that Dr. Hoeh does but with more caution and a different year of adjustment. He writes in footnote 1, p. 2-10:

> There is **some evidence** that an adjustment to the Hebrew calendar **may have taken place** during the Patriarchate of Simon III (140-163). See "Cyrus Adler, "Calendar, History of," in The Jewish Encyclopedia (New York: Funk and Wagnalls, 1907), Vol. 3, p. 500

Kossey also states that the intercalary cycle of Jesus' time was years 2, 5, 7, 10, 13, 16, and 18 of a 19-year cycle. However, he goes a major step further. He places the date of adjustment in 142 AD, not 161 AD and then proceeds to build this cycle into his calendar mathematics. That is, the intercalary cycle before 142 AD consists of years 2, 5, 7, 10, 13, 16, and 18 of a 19-year cycle. And, the intercalary cycle after 142 AD consists of years 3, 6, 8, 11, 14, 17, and 19 of a 19-year cycle. Kossey's work is the basis of an automated Hebrew Calendar written in Turbo Pascal by Robert Newman. Newman, however, goes Hoeh and Kossey a step better. He has built into his software an adjustment date of 256 AD! Ambassador College copyrighted an automated calendar in 1986 based on Kossey's work. We are not informed which adjustment date was built into this software.

> Under the patriarchate of Simon III. (140-163) a great quarrel arose concerning the feast-days and the leap year, which threatened to cause a permanent schism between the Babylonian and the Palestinian communities-a result which was only Aberted by the exercise of much diplomacy.

A search of the *Encyclopaedia Judaica* for a Patriarchate by the name of Simon III turned out to be fruitless. He could not be found. A Simeon Ben

Gamaliel II who lived during the first half of the second century did show up. We believe he is the same person as Simon III:

> SIMEON BEN GAMALIEL II (of Jabneh), *nasi* (first half of second century C.E.), the son of Rabban Gamaliel of Jabneh and the father of Judah ha-Nasi. **Simeon was one of the few survivors after the Romans destroyed the house of the *nasi* in revenge for the Bar Kokhba revolt (Sot. 49b), and he was compelled to conceal himself during the whole period of the persecutions that followed the destruction of Bethar (Ta'an. 29a. on the assumption that the reference is to Simeon b. Gamaliel and not to his father). Even after the death of Hadrian, Simeon could not appear in public, and for this reason apparently was absent from the meeting of the scholars that took place in order to renew the intercalation of the calendar in the valley of Rimmon, after the revolt (TJ, Hag. 3:1, 78c.).** Similarly, he was still absent from the first session of the scholars in Usha. When the persecution abated and the danger to his life passed, he was appointed *nasi* of the Sanhedrin at the second meeting of the sages in Usha, as the son of the *nasi* Gamaliel and a link in the chain of the *nesi'im* descended from Hillel. It is probable that the lengthy period when the Sanhedrin functioned without a *nasi* rendered Simeon's task a difficult one and he had to win his place with flexibility and understanding. Serving with him as *Ab bet din* was Nathan the Babylonian, and as *hakham* (apparently the head of and the deciding factor in the yeshivah), Meir.

Simon or Simeon Ben Gamaliel II could not possibly have shifted the year of intercalation in 161 from the 7th year to the 8th year of the cycle, even if it were true that a shift occurred. Simon was not at the assembly that renewed the intercalation of the calendar.

The assumed pattern of intercalation prior to 161 AD is years 2, 5, 7, 10, 13, 16 and 18. The assumed pattern of intercalation after 161 AD is years 2, 5, 8, 11, 14, 17, and 19. The following charts will illustrate this assumed change:

# Mythological Shift in Intercalary Pattern in 161 AD

## 19-Year Cycle
## Based
## On 3760 BC

| Date AD | Common Year | Leap Year |
|---|---|---|
| 135 | 1 | |
| 136 | | 2 |
| 137 | 3 | |
| 138 | 4 | |
| 139 | | 5 |
| 140 | 6 | |
| 141 | | 7 |
| 142 | 8 | |
| 143 | 9 | |
| 144 | | 10 |
| 145 | 11 | |
| 146 | 12 | |
| 147 | | 13 |
| 148 | 14 | |
| 149 | 15 | |
| 150 | | 16 |
| 151 | 17 | |
| 152 | | 18 |
| 153 | 19 | |

## 19-Year Cycle
## Based
## On 3760 BC

| Date AD | Common Year | Leap Year |
|---|---|---|
| 154 | 1 | |
| 155 | | 2 |
| 156 | 3 | |
| 157 | 4 | |
| 158 | | 5 |
| 159 | 6 | |
| 160 | 7 | |
| 161 | | 8 |
| 162 | 9 | |
| 163 | 10 | |
| 164 | | 11 |
| 165 | 12 | |
| 166 | 13 | |
| 167 | | 14 |
| 168 | 15 | |
| 169 | 16 | |
| 170 | | 17 |
| 171 | 18 | |
| 172 | | 19 |

To our knowledge, the rabbis of old never debated the above intercalary pattern of 2, 5, 8, 11, 14, 17, and 19. This intercalary pattern is pure myth, and never came up in rabbinic debate. There was no change to the intercalary cycle of 3, 6, 8, 11, 14, 17, and 19 of the time of Christ and Simon III. The only thing the rabbis did was gather in the Valley of Rimmon to reinstate the 3, 6, 8, 11, 14, 17, and 19 leap year sequence that had been disrupted because of the debacle of Bar Kokhba.

# Chapter Seven

## The History of the Calendar According to Frank W. Nelte

In July 1996 (updated March 1997) Frank W. Nelte added his voice to the calendar debate with a publication entitled "The Jewish Calendar and God's Holy Days." In it he outlines his view of the history of the calendar from Adam and Eve, down through Noah, Moses, David, Ezra, the time of Christ, the early church, the Middle Ages (476 to 1450 AD) and down to the present. He then critiques several calendar papers and concludes with his own suggestions on how to resolve the "many problems of the Jewish Calendar." Because Nelte's paper does not present calendar records in a chronological context, his statements and conclusions appear to be valid and well founded. But when these statements are analyzed from a chronological perspective, beginning with the calendar of Adam and Eve and proceeding down through history to the present, it is apparent that his arguments are inconsistent and contradictory.

Nelte begins his paper with a short discussion of the calendar terms found in Genesis 1:14, and acknowledges that the order of the solar system at the creation was "very good"—or in his opinion, "perfect". He then states that the orbits of the sun, the moon and the earth are "**not** very good" at this time. He asserts that they are "not perfect" due to the sins of mankind, which resulted in God's "corrupting" the perfect 30-day orbit of the moon, and establishing the 29 day, 12 hours, 44 minutes and 2.8 second lunar orbit of today. He also asserts that God "corrupted" the earth's orbit by changing it from 360 days to 365 days, 5 hours, 48 minutes and 46 seconds, and that this change was also due to man's sins.

These statements might lead us to conclude that the calendar was "corrupted" during the time before the Flood, when the sins of mankind became so extreme that God repented of creating mankind. However, this is not what Nelte is arguing. Despite the grievous sins of mankind, he

maintains that the calendar was perfect, uncorrupted and therefore "sacred" down to the days of Noah. We know this to be factual, Nelte assures us, due to the form of the narrative in Genesis.

Sometime between the days of Noah and Hezekiah, he asserts, God intervened in the heavens and "corrupted" the perfect orbits of the sun, earth and moon. Henceforth, all holy day calendars are by his definition "corrupted" because the orbits of the sun, earth, and moon have not been restored to their original perfection. Calendars after the changes in the solar system represent corrupted orbits of a corrupted solar system, and God will not place His stamp of approval on them. Only when God restores the solar system to its previous perfection will we have a perfect, uncorrupted and sacred calendar, he maintains.

Nelte does not believe that God gave Moses a calendar, but that the calendar of Israel was inherited from Noah, and was the same calendar that God had given to Adam and Eve. He asserts, however, that at the time of Moses, God changed the beginning of the calendar year from the fall to the spring. We can thus infer that the perfect calendar God gave to Adam (and the calendar that Noah inherited from Adam) began in the fall of the year.

Nelte acknowledges that the calendar of King David was fixed, not based on observation. (Comment: The *Gezer Calendar** has historically confirmed this fact. Recorded on a limestone tablet, this calendar dates from the time of Solomon and was calculated from the fall of the year, not from the spring.) King David, Nelte maintains, had a fixed calendar and so did the Israelites before him. We can infer, then, that this fixed calendar had been passed down to Israel from Noah, since Nelte indicates that Moses inherited a calendar from Noah. Because God approved Moses' calendar, the calendar was not yet "corrupted," and therefore the months were fixed at 30 days each, making a lunar year of 360 days.

Nelte does not know when the "corruption" of the orbits of the sun, earth and moon occurred, but he speculates that this may have taken place at the time of Joshua or in the days of Hezekiah. He apparently forgets that Joshua

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* Please visit the following website for a good description of and a good translation of the *Gezer Calendar*: http://www.kchanson.com/PTJ/gezer.html#Gib

lived 400 years before King David, and since David had a perfect calendar, this "corruption" could not have occurred in the days of Joshua. This leaves the days of Hezekiah as the probable time of the "corruption" of the calendar.

King Hezekiah ruled Judah in the late eighth century BC, about 300 years after King David. If Nelte's reasoning is correct, a perfect calendar existed from the time of Adam down through the years of the Kingdom of Israel and well into the days of the Kingdom of Judah—a period of about 3,300 years.

Then suddenly, according to Nelte, God corrupted His perfect calendar. The orbit of the moon around the earth was corrupted from a perfect 30-day cycle to one that varied between 29.25 to 29.80 days. The orbit of the earth around the sun was corrupted from a perfect 360 days per year to one of 365+ days. No longer did both the earth and the moon have a perfect balance between them of 360 days in each cycle. The summer and winter solstices no longer occurred at their perfect 90-day intervals. The spring and fall equinoxes no longer occurred at their perfect 90-day intervals. The perfect, godly and sacred *Tekufot* of God's original calendar were all corrupted. And, Nelte assures us, since God does not partake of anything that is corrupted, the calendar had fallen from God's grace, and Judah was plunged into calendar darkness.

If Nelte's assertions concerning the "corruption" of the calendar are correct, we can only conclude that the remaining Jewish kings from Manasseh to Zedekiah had no calendar. This would include King Josiah, during whose reign the nation of Judah repented and renewed their covenant with God, beginning with the observance of the Passover and the Feast of Unleavened Bread. This would also include the days of the prophet Jeremiah, who faithfully served God and observed His holy days. This would also include the time of the high priest Hilkiah, ancestor of Ezra, whose responsibility it was to regulate the temple service, including the commanded offerings for the annual holy days. In light of the Scriptural records, it is evident that God recognized the observance of His holy days during this period of history, which would not have been possible without a calendar that was valid in His eyes.

Was this calendar that God recognized lost or "corrupted" when Judah was carried captive to Babylon? Nelte asserts that at the time of the captivity, Judah had no calendar of her own, and the Jews therefore adopted the calendar of the Babylonians. This is why the calendar of Judah came to have Babylonian month names. But this calendar, according to Nelte, was not a luni-solar calendar—it was a lunar calendar with no intercalation, due to the fact that the 19-year relationship between the orbits of the moon and the sun (the 19-year cycle) had not yet been discovered. Thus for more than 160 years, the observance of the holy days would have shifted backward year after year from the fall, through the summer, through the spring and finally through the winter—not returning to their proper seasons for 33 years, and then repeating the same cycle again and again.

According to Nelte, the 19-year cycle was not discovered until four centuries before the time of Christ.* Finally, in 432 BC, a Greek astronomer by the name of Meton discovered the 19-year cycle. Ezra and Nehemiah immediately saw its relevance to the calendar and adopted it. However, they did not adopt Meton's calculations, as those were inaccurate. (Comment: The mathematical proof of the inaccuracy of Meton's calculations was not demonstrated by Hipparchus until the year 146 BC, 286 years after Meton's discovery, but we are asked to believe that Ezra and Nehemiah knew Meton had missed the mark.) But how could this be as they both lived one hundred years before Meton and five hundred years before Hipparchus! Strangely, even after Hipparchus rectified Meton's calculation, the Judean astronomers of 146 BC did not incorporate his findings as part of their calendar calculations, and the calendar, although intercalated, continued to have imperfect calculations.

Nelte does not venture a guess as to what the intercalary cycle may have been from the time of Ezra down to the time of Christ. However, he states quite dogmatically that by the time of Christ the intercalary cycle was years 2, 5, 7, 10, 13, 16 and 18. We know this for a fact, he assures us, because "this is the general consensus." Who constitutes this consensus we are not told.

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* See article "Historical Evidence of the 19-Year Intercalation Cycle" at www.cbcg.org.

Assuming for a moment that Nelte is correct in this matter, we would conclude that the calendar of Christ was intercalated at years 2, 5, 7, 13, 16 and 18 of the 19-year cycle. Each of these years of intercalation would have had a thirteenth month. Nelte informs us that this additional month was a second Adar. He also states that both Elul and the Adar next to Nisan are always fixed at 29 days. He further states that visibility of the new crescent was not the deciding factor in determining the months, but that they were calculated by the mean molad. In other words, months were calculated from Tishri back to Nisan at the time of Christ and had fixed lengths—they were not determined by observation.

Nelte tells us that Judean astronomers did not adopt Hipparchus' calculations until the time of Rabbi Samuel, around 250 AD. This would mean that calendar calculations for the 19-year cycle were inaccurate for nearly another 400 years.

Nelte's statements imply that Judah limped along with a very crude and slowly evolving calendar based on unrefined "corrupt" orbital data, that had an extremely inaccurate 19-year cycle, from the time of Meton's discovery in 432 BC to the time of Rabbi Samuel's adaptations in 250 AD—a span of nearly 700 years. (Comment: This would include the entire New Testament period and would mean that Jesus and His apostles, and all the early churches, were observing the holy days according to a corrupted and inaccurate calendar.) Samuel, we are told, was solely responsible for the introduction of Hipparchus' calculations of 146 BC. We know that Samuel copied the figures from Hipparchus, we are told, because Samuel's figures match those of Hipparchus. Nelte asserts that Rabbi Samuel single-handedly changed the years of intercalation for each 19-year cycle from the original 2, 5, 7, 10, 13, 16, 18 cycle to a 3, 6, 8, 11, 14, 17, 19 cycle.

Mar Samuel allegedly instituted this change in leap year cycles and the introduction of Hipparchus' calculations in either 250 or 255 AD. Nelte maintains that Samuel did so because the old intercalary cycle was invariably moving the feasts away from the fall season down toward the equinox and would eventually move the feasts past the equinox into summer. But Samuel, the premier astronomer of the Diaspora, made a gigantic miscalculation. By as early as 273 AD, a mere 18 years after Samuel instituted his changes, the fall festivals fell through the *Tekufot* barrier, plunging downward into the month of August. This tragedy was

repeated 11 years later in 284 AD—the second time in the same 19-year cycle. Samuel was dead by this time, so he did not live to see the error of his computations. Nelte tells us that Samuel's calculations were inaccurate because Samuel had no computer with the appropriate software.

According to Nelte, Hillel II, president of the calendar court of Tiberias, Palestine, retained the disastrous intercalary cycle of 3, 6, 8, 11, 14, 17 and 19 years. (Comment: As a direct descendent of Rabban Gamaliel the Elder, who was of the time of Christ and Paul, Hillel II was the acknowledged calendar expert of his day.)

Nelte states that if Samuel had retained the old intercalary cycle, the fall festivals would have been safe from plunging through the *Tekufot* barrier until 1522 AD. If Hillel had had a computer with Nelte's program, he would have realized this and retained the old intercalary cycle, and would have recommended a switch in 1522 AD from the old intercalary cycle of years 2, 5, 7, 10, 13, 16, 18 to years 2, 5, 8, 10, 13, 16, 18. Hillel II would have known that this cycle would protect the fall festivals from falling through the *Tekufot* barrier until 1825 AD. Beginning with year 1826 AD, Hillel II would have switched the cycle once again, this time to years 3, 5, 8, 11, 13, 16, 19 years. Nelte asserts that this cycle would be accurate to the year 2889 AD. If only Hillel II had known!

Nelte concludes that although we cannot rectify the corrupted orbits of the sun, moon and earth, we can protect ourselves from the corruption of the *Tekufot* and discard Hillel's 3, 6, 8, 11, 14, 17, 19 cycle for the above 3, 5, 8, 11, 13, 16, 19 cycle. This is Nelte's solution to the calendar problem. He believes this cycle to be more accurate than the present intercalary cycle, which he claims was instituted three centuries after the time of Christ.

# Chapter Eight

## Nelte on Nelte

In this section of our analysis, we will examine three of Nelte's core arguments: appointed times, Postponement Rule 1, and the history of intercalary cycles. As we proceed, we will see that Nelte contradicts himself repeatedly, reasons to faulty conclusions, and then uses those faulty conclusions in an attempt to prove his point. Quotes from Nelte's paper are in smaller print and are indented. These quotes, which are scattered throughout his paper, are brought together to illustrate the inconsistencies in his arguments.

## Nelte on Appointed Times

In the following quote, Nelte properly defines the Hebrew word *mow'ed*, translated "seasons" in Genesis 1:14 and "appointed season" in Numbers 9:2, as fixed or appointed times on which to meet or assemble:

> The word translated as "seasons" is **"mow'ed",** which is used 223 times in the Old Testament. It is translated 150 times as "CONGREGATION", 23 times as "FEAST", 13 times as "SEASON", 12 times as "APPOINTED" and 12 times as "TIME". **It comes from a root word which means: to fix, to appoint, to meet, to assemble.**
>
> Numbers 9:2 instructs us ...
>
> > Let the children of Israel also keep the passover AT HIS APPOINTED SEASON. (Numbers 9:2)
>
> The word here translated as **"appointed season"** is **"mow'ed",** which we saw earlier. It basically means: **a time that has been fixed for assembling. As such it does not tell us anything about "a season"; the focus is really on the fact that it has been appointed.**

After declaring that the word "mow'ed" refers to an appointed time, Nelte clearly states that this appointed time should not be determined by the Julian or the Gregorian calendars:

> From Genesis 1:14 alone it should be quite clear that neither **the Julian nor the Gregorian calendar (both of which are totally independent of the movements of the moon) should be used to determine the times when God wants us to assemble together.** That information is contained in the Hebrew word translated as "seasons".

Nelte acknowledges that neither the Julian nor the Gregorian Calendars, which are strictly solar calendars, should determine the appointed times of God. (Comment: These calendars are based solely on the equinoxes and solstices of the solar year, and take no account of the lunar year, which is the basis of the Hebrew Calendar.) However, he is adopting the calculations of these solar calendars when he insists that our meeting times must be either on or after the spring equinox, and on or after the autumnal equinox. In doing so, he is moving our brethren away from God's appointed times to dates set by a solar calendar:

> As far as the seasons and the equinoxes are concerned….
>
> > "The two points at which the ecliptic intersects the celestial equator are called nodes or equinoxes. The sun is at the VERNAL EQUINOX about MARCH 21 and at the AUTUMNAL EQUINOX about SEPTEMBER 23….The names of the four points correspond to THE SEASONS BEGINNING in the northern hemisphere ON THESE DATES.

Nelte has substituted the appointed times of the Hebrew Calendar, which is luni-solar, for the equinoxes of the Julian and Gregorian solar Calendars:

> **It should be quite clear that the Jewish understanding of the Hebrew word "tekuphah" is that it refers to the solstices and the equinoxes.** The word is used only four times in the Old Testament, and in Psalm 19:6, where it is used in reference to the sun, it is translated as "circuit". There is no reason to doubt that the Jewish understanding that "tekuphah" pinpoints the start of the four seasons at the equinoxes and the solstices is in fact correct.

To support his argument, Nelte appeals to "the common view" of traditional Judaism:

> The word "tekuphah" (plural is tekuphot) is explained as follows in Encyclopedia Judaica, article CALENDAR:
>
> > "TEKUFOT ("Seasons"). As stated, the four seasons in the Jewish year are called 'tekufot'. MORE ACCURATELY, it is THE BEGINNING OF EACH OF THE FOUR SEASONS -- according to the common view, the mean beginning -- that is named 'tekufah' (literally "circuit", related to "to

> go around"), the 'tekufah' of Nisan denoting the mean sun at the vernal equinoctial point, that of Tammuz denoting it at the summer solstitial point, that of Tishri, at the autumnal equinoctial point, and that of Tevet, at the winter solstitial point." (page 46, volume 5)
>
> **Thus Exodus 34:22 tells us that the Feast of Tabernacles is to be kept at or after the autumnal equinox."**

In relying on the traditional Jewish definition of "tekuphah," Nelte makes mention of only one of the four usages of this Hebrew term in Scripture. He fails to mention that "tekuphah," which simply means "to complete a circuit," is used in I Samuel 1:20 in reference to the completion of nine months of pregnancy. Only in Psalm 19:6 does "tekuphah" refer to the completion of the solar cycle. And in this verse, there is no reference to set points during the cycle, but only to the completion of the cycle. (A complete analysis of the four occurrences of "tekuphah" in Scripture may be viewed online under the title *The Feast of Trumpets 2000*. Our website address is: www.cbcg.org).

If Scripture clearly defines "tekuphah" and the exact timing of the feasts of Nisan and Tishri in regard to the equinoxes, then where is the further definition from Scripture as to precisely how this "tekuphah" is to divide these months with respect to the festivals? Now, if the *mow'ed* of Leviticus 23 refers to the harvest season, should the weekly Sabbath of those seasons fall in the winter or summer, for the weekly Sabbath is a holy day as well (Lev. 23)?

Because Nelte has accepted a faulty definition of "tekuphah," he looks to the equinoxes of the solar calendar to determine the meaning of God's appointed times, or "mow'ed." Since the calculations of the Hebrew Calendar give no consideration to these solar dates, Nelte views the Hebrew Calendar as inaccurate:

> What none of the authors of the articles which endorse the Jewish calendar seem to understand is that there is an UNAVOIDABLE SHIFT AWAY FROM THE EQUINOX (AND THEREFORE A SEASONAL SHIFT!) inherent in the Hebrew calendar.

Nelte argues that the Passover and the Feast of Tabernacles inexorably drift one day away from the equinoxes every 216 years. This drift over the centuries is insignificant by his own admission, yet he sees it as a problem because he is convinced that the appointed times CANNOT fall before the

equinox. Again, he is relying on the solar calendar dates to determine the appointed times of God, rather than on the calculations of the luni-solar Hebrew Calendar. As a result, he presents page after page of computer data to argue his point. In one chart, he dates the latest Passovers from 3754 BC to 68 BC. The Passover of 3754 BC is dated May 9 and is 18 days after the vernal equinox. The Passover of 68 BC is dated April 27, a full 34 days after the vernal equinox. This amounts to a drift of 16 days in 3,686 years, or a drift of 1 day every 230.375 years.

Nelte places great trust in his computer calculations, which are based on the present cycles of the earth and moon. He overlooks the fact that if these cycles were indeed changed in the days of Hezekiah, as he has speculated, none of his software is applicable to the years before the 800's. This change would make Nelte's equinox calculations from 3754 through 828 BC completely erroneous. Furthermore, Nelte utilizes the wrong leap year sequence from 255 AD back into history. Thus, all of his calculations prior to 255 AD are erroneous.

In viewing a Passover before the spring equinox as a problem, Nelte is overlooking a vital fact: no calendar that uses the lunar year as its basis can be kept in constant synchronization with the solar year. Due to the shorter number of days in the lunar year, the Passover will gradually fall earlier in the spring until an intercalary year arrives. The addition of a thirteenth month in such years moves the Passover back to the later weeks of spring. This cycle is repeated seven times in each 19-year cycle.

The adjustment of a luni-solar calendar by inserting an additional month is required at least once in three years. Each lunar year is almost 11 days shorter than the solar year. In two years, the shortfall is about 21 days. After year two, the Passover will be almost three weeks earlier in season as compared to the past leap year. By year three, the shortfall can exceed one full month. It is therefore necessary to add a 13th month to realign the lunar months.

So, the question is: Why should the shift in the date of the Passover be viewed as a problem? There is no other way for a calendar that is based on the lunar cycle to be realigned with the solar cycle. God, by virtue of the fact that He allows the lunar-solar relationships as they exist, is happy with a three-week window of time in which to "appoint" the festivals.

# Nelte on Postponement Rule 1

Nelte argues in the following quote that there is no evidence of the existence of postponement rules before 250 AD. Therefore, Passover could not have fallen on a Wednesday in 31 AD.

> The main purpose of the booklet [The Crucifixion was Not on Friday by Herman L. Hoeh] was to show that Christ was crucified on a Wednesday and not on a Friday. Towards this end Dr. Hoeh proposes to present "seven historical and calendrical proofs". In the process he appeals to the Hebrew calendar and points out that in both, 30 A.D. and in 31 A.D., the Passover fell on a Wednesday. The Passover dates he presents are as follows:
>
> A.D. 29 = Saturday, April 16
> A.D. 30 = Wednesday, April 5
> A.D. 31 = Wednesday, April 25
> A.D. 32 = Monday, April 14
> A.D. 33 = Friday, April 3
>
> What he does not point out is that of those five dates ONLY the 30 A.D. date is not the result of a postponement! **Without postponements (the existence of which is not proved for the time prior to 250 A.D. in ANY records that are available!)** these dates would look as follows (all observed the previous evening):

Elsewhere in the paper Nelte argues that Postponement Rule 1 developed gradually, and was only two thirds developed by around 300 AD, just before the time of Hillel II. By 300 AD, postponements were made if the molad fell on either a Wednesday or a Friday.

> Here is another quote from the Encyclopedia Judaica, volume 5, article 'Calendar', page 49:
>
> > "Some of these variations were early eliminated. Already under the aegis of R. Judah ha-Nasi (c. 200) and of his pupil Rav (d. 247), Elul and Adar (in a leap year Adar II) contained invariably 29 days only. R. Yose b. Bun (c.300) assumed the same fixed number of days in the months Adar-Elul as in the present calendar, WITH ROSH HA-SHANAH POSTPONED FROM WEDNESDAY AND FRIDAY BUT NOT YET FROM SUNDAY (Talmud Jerusalem Meg. 1:2, 70b)."
>
> Did you notice this candid admission? The postponement rule #1 was A GRADUAL DEVELOPMENT! **By around 300 A.D. (coming to Hillel II's time) this rule was TWO-THIRDS developed! Postponements were made if the molad fell on Wednesday or Friday ... but there was not yet a**

**postponement if the molad fell on Sunday**. But the first two-thirds of that rule didn't yet exist at the time of Judah ha-Nasi (the last of the tannaim who died around 220 A.D.), who ALSO wrote about the calendar. So this rule #1 didn't yet exist when the Mishnah was completed. Therefore there is no evidence of it in the Mishnah, though it is referred to in the later Gemara.

Do we understand that **there is NO EVIDENCE AT ALL that this postponement rule #1 was in force at the time of Christ?** Consider the following facts about the cycle during which the crucifixion took place.

So in summary: **There is no evidence which justifies the existence of postponement rule #1**. Without rule #1 rules #3 and #4 automatically fall away; their only function is to neutralize errors that are introduced by rule #1.

You can see why people will not claim that the present order of leap years was in force back then ... because then there would not have been any possibility of a 31 A.D. Passover on a Wednesday at all! It is only by acknowledging the Pre-255 A.D. sequence that a Wednesday Passover in 31 A.D. becomes a theoretical possibility ... but STILL only by assuming that the postponement rules, for which not a shred of evidence exists prior to the time of Hillel II (!), were applied!

Nelte spends a great deal of time in the paper arguing against the arguments of Herman L. Hoeh. One of these arguments centers on Hoeh's justification for the supposed change in leap years in 142 A.D. from the 2, 5, 7, 10, 13, 16, 18 sequence to the 3, 6, 8, 11, 14, 17, 19 sequence of today. Hoeh's reason, Nelte asserts is totally false.

Notice how Dr. Hoeh justifies He writes:

> "This postponement (in the sequence of leap years) in 142 A.D. was necessary OR ELSE the Passover would have occurred too late in the year and would not have been observed in its proper season." (page 45)

THAT IS TOTALLY FALSE!

Nelte then proceeds to argue his case that no such change was needed in 142 AD:

Here are the facts.

The year 142 A.D. was the 8th year of Cycle #206 **from the 3761 B.C. starting date.** During that cycle the vernal equinox was still at March 23 and the autumn equinox was at September 25.

In the beginning of his argument, Nelte fails to consider that the starting date 3761 BC is based on a leap year cycle of 3, 6, 8, 11, 14, 17, 19 years—a cycle which had supposedly not yet been instituted in 142 AD. Continuing to build his argument, Nelte appeals to the supposed sequence of 2, 5, 7, 10, 13, 16 and 18 years to demonstrate that the earliest Feast of Tabernacles celebrated in that 19-year cycle was on the evening of September 24, 150 AD. He states that this date is one day before the equinox, and that Passover that year was on Tuesday, April 1, more than a week after the vernal equinox. Nelte arrives at these dates by applying a 2-day postponement of Trumpets, which is based on an intercalary cycle of 3, 6, 8, 11, 14, 17 and 19 years.

> **Employing the old sequence of leap years** (the "Pre 255-A.D." sequence) we find the following facts:
>
> EARLIEST F.O.T. IN THAT CYCLE = 150 A.D.
> Starting date = evening of September 24
>
> {**This starting date is due to a 2-day postponement of Trumpets, since the molad of Tishri fell on Tuesday, September 9 at 17 Hours and 1044 Parts** Therefore exactly 2 cycles later, in 188 A.D. when the molad did NOT require any postponements, then according to this sequence of leap years F.O.T. would have started on Sunday evening, September 22. That is VERY CLEARLY still before the equinox!}

Switching back to 142 AD, Nelte again utilizes postponement rules to prove his point. This time he applies Rule 2 and Rule 1, in that order. To arrive at his proposed Tabernacles date of Saturday, October 22, in 142 AD, he applies Rule 2 to postpone Trumpets from Sabbath to Sunday, and Rule 1 to postpone Trumpets from Sunday to Monday. On one hand, Nelte acknowledges that Rule 3 cannot exist without Rule 1. On the other hand, he asserts that Rule 1 was only two thirds developed by 300 AD. Since he uses Rule 3 in his calculations we must assume that he recognizes its application to this earlier time period. After dogmatically stating that the Sunday provision was not added to Rule 1 until the time of Hillel II (around 350 AD), he uses this supposedly non-existent element of Rule 1 two centuries before its invention:

> LATEST F.O.T. IN THAT CYCLE = 142 A.D.
> Starting date = evening of Sunday, October 22

{**This starting date is also due to a 2-day postponement of Trumpets, since the molad of Tishri fell on Saturday, October 7 at 18 Hours and 10 Parts** Therefore exactly 5 cycles later, in 237 A.D. when the molad did NOT require any postponements, then according to this sequence of leap years this "latest" F.O.T. would have started on Friday evening, October 20.}

Nelte continues by again acknowledging the existence of the Sunday provision before the time of Hillel II:

> Now let's examine the effect of the change in leap years, which Dr. Hoeh so readily justifies.
>
> Employing the new sequence of leap years, the one which is still in use today (the "Normal" sequence), we find the following facts:
>
> EARLIEST F.O.T. IN THAT CYCLE = 140 A.D. and 151 A.D.
> Starting date = the evening of September 13 in both years.
> Last Great Day = September 21
>
> {**In both those years the starting date was due to a postponement of 1 day.** Thus exactly 2 cycles later when no postponement was required, in 189 A.D. Tabernacles started on Friday evening, September 12, and the Last Great Day concluded on September 20 ... A FULL 4 DAYS BEFORE THE EQUINOX! And Tabernacles would have STARTED a full 12 DAYS before the equinox!}

In referring to these two postponements, Nelte fails to mention that in the year 151 AD, Trumpets was postponed from a Sunday to a Monday. Here again is an admission of the existence of the Sunday provision long before the time of Hillel II.

While he acknowledges the earlier utilization of the Sunday provision in Rule 1, Nelte argues that the entire postponement rule is mere Jewish tradition:

> Let's face the facts: this rule of postponing the Feast of Trumpets from a Sunday, Wednesday or Friday is nothing more than "A TRADITION" of the Jews. It has no biblical basis! It is only human reasoning which justifies this rule of postponement.

If, indeed, this rule did not develop until the time of Hillel II, then Nelte would be justified in making this statement. However, the earlier existence of Rule 1 is clearly confirmed by Scriptural and historical records that date back to the time of Christ. This evidence will be presented in the following pages of this paper.

Nelte goes on to dispute the dates used by Hoeh to prove a 31 AD crucifixion. Proof of postponements is at the heart of the argument. Hoeh argues for a 31 AD crucifixion, and Nelte for a 30 AD crucifixion. Nelte writes,

> The dating of the decree of Artaxerxes at the time of Ezra (just before Meton discovered 19-year cycles) makes a 30 A.D. crucifixion much more likely than a 31 A.D. crucifixion. **And apart from the speculation about a 31 A.D. crucifixion, there is no evidence at all for the postponement rules having been in force before the time of Hillel II. There are no references to indicate that before Hillel II this rule even existed, except VERY SHORTLY BEFORE Hillel's time a reference to TWO-THIRDS of this rule. This is mentioned in the Encyclopedia Judaica.**

In striking at Hoeh's 31 AD argument, Nelte attempts to demonstrate that Hoeh's regnal years for Artaxerxes are off by one year. Here is Nelte's argument:

> **In 464 B.C. the molad of Tishri fell on Friday, October 6th and Trumpets was thus (theoretically at least) postponed to Saturday, October 7th.** The 14th of Nisan that year **(accepting the 1 day postponement)** was kept on April 26th, which would have been the 15th day after the new moon **because of the postponement of one day**. So the molad of Nisan in Jerusalem was April 12th, or one day before the new moon in Babylon. {As calculated from the molads, the new moon was April 12, H3 P153, or April 11, 9:08:30 p.m..} **So the Babylonian new moon tables are certainly accurate in this case.**

Nelte again supports the use of Postponement Rule 1 to establish dates for holy days that occurred long before the time of Hillel II. He accepts the application of Rule 1 to move Trumpets in 464 BC from Friday, October 6, to Saturday, October 7. This was seven centuries before the time of Hillel II. Nelte's use of this postponement rule is in direct conflict with his assertion that Rule 1 was a later development of Jewish tradition and neither godly nor Biblical.

As we will demonstrate in this paper, Postponement Rule 1 was utilized in both 26 AD and 27 AD to establish the dates of the Feast of Trumpets. These two dates mark the beginning and end of the year in which Jesus began His ministry. This year was acceptable to the Father, as prophesied in the Old Testament and confirmed by the Gospel writers.

Rule 1 has been a systemic element of the Hebrew Calendar since the days of Ezra. In fact, it is impossible to have a visible crescent going into Trumpets without the activation of Postponement Rule 1. Those who object to the utilization of the postponement rules are apparently unaware of this astronomical reality.

## Nelte on the History of Intercalary Cycles

Nelte writes that the correct pattern for an intercalary sequence of years is 3-3-2-3-3-3-2:

> You will notice that irrespective of which sequence you select…**it must ALWAYS be a form of the 3-3-2-3-3-3-2 sequence from leap year to leap year**…

The present leap year cycle of years 3, 6, 8, 11, 14, 17 and 19 follows this pattern. This intercalary cycle, Nelte writes, was introduced by Rabbi Mar Samuel in 250 AD or 255 AD and endorsed by Hillel II in 358/359 AD. Nelte asserts that prior to 250 AD, the intercalary cycle was 2, 5, 7, 10, 13, 16 and 18. It is interesting to note that sequence 2, 5, 7, 10, 13, 16 and 18 is a 2-3-2-3-3-3-2 sequence, and does not fit the correct intercalary pattern.

> It is generally accepted that **prior to 250 A.D. the sequence of intercalation** (the sequence of the leap years) **was 2,5,7,10,13,16,18. This was changed as a result of the studies by Mar Samuel (or Samuel Yarhinai) who died around 250 A.D.. At that time the sequence was changed to 3,6,8,11,14,17,19.**
>
> The reason is that the cycle was changed **in the year 255 A.D**. That was the 7th year of the cycle. Until then it had always been a leap year. But in that year **the leap year cycle was changed to 3,6,8,11,14,17,19.** Thus, while the year 255 started at the same time as in the previous cycle, it ENDED one month earlier, since it was no longer a leap year. And so from year 256 A.D. onwards you will notice different dates for the molads of years 8 (256 A.D.), 11 (259 A.D.), 14 (262 A.D.), 17 (265 A.D.) and 19 (267 A.D.). In subsequent cycles the difference will also affect years 3 and 6.

Nelte's assertion that the intercalary cycle was different before 255 AD is completely unfounded. As we demonstrated earlier in this paper, the present intercalary cycle was in effect during the lifetime of Jesus Christ. The Scriptural and historical evidence conclusively establishes this fact by pinpointing the date of Tishri 1 in 5 BC and Tishri 1 in 70 AD. Nelte's

misguided belief in a different intercalary cycle leads him to conclude that the present cycle is not correct and is causing problems:

> In looking at this information, the current sequence seems SO CLOSE to being correct, that we might be inclined to feel a loyalty towards it to stick it out with that sequence. HOWEVER, based on this sequence, even 200 years from now, farmers will STILL have to go to the Feast of Tabernacles before the autumn equinox. **The mistake Mar Samuel introduced around 250 A.D., and which about 100 years later Hillel II endorsed,** will still not have been fully eradicated by 2200 A.D.. In effect, they set the calendar OFF TRACK for the next 2000 years! I hope you can understand this.

To support his belief that the intercalary cycle was changed by Samuel, Nelte appeals to the testimony of Rabbi Hai Gaon of the early 11th century:

> From the testimony of rabbi Hai Gaon [Gaon means "Illustrious" and it is a title of honour], who lived in the 11th century, it is known that the calendar can be traced back to these two men ... Samuel and Hillel II.

Nelte fails to consider that Rabbi Hai Gaon did not live in Palestine but in the Diaspora. As chief rabbi of the Babylonian Jews, he did not represent the traditional position of the Palestinian Bet Din, which had for centuries been the legal and scholarly authority in calendar matters. In expressing his personal opinion, Rabbi Hai Gaon contradicts the only written history of early Judaism. The Talmudic records show that in the days of Gamaliel I, who lived during the lifetime of Christ, the calendar was already fixed, and included the application of postponements. Thus the historical evidence contradicts the Jewish author Shlomo Sternberg, whose opinion Nelte also quotes:

> In the book "Studies in Hebrew Astronomy and Mathematics", listed at the start of this article, Shlomo Sternberg wrote in the introduction:
>
> > **The second Hillel and his court enacted the fixed calendar which is still enforced today.**

After supporting the opinion that the calendar was fixed in the days of Hillel II, Nelte implies that the present intercalary cycle of 3, 6, 8, 11, 14, 17 and 19 years was not actually utilized by the Hebrew Calendar until many centuries later. Nelte writes that there is no record that this sequence was part of the calendar canon before the time of Maimonides:

> However, there is NO RECORD at all that the leap year sequence of 3, 6, 8, 11, 14, 17, 19 (as used today and supposedly fixed by Hillel II) was a part of the canon until about 1200 A.D., at the time of the Jewish scholar Moses Maimonides.
>
> Scholars know this from a very detailed and authoritative manuscript called "Al-Biruni, Athar-ul-Bakiya", which was written around 1000 A.D., and which was translated into English by **Dr. C. E. Sachau under the title "The Chronology of Ancient Nations, or Vestiges of the Past",** and published for the Oriental Translation Fund in London in 1879. It has a detailed discussion of the Hebrew calendar. But it **TOTALLY OMITS any reference to a fixed sequence of leap years.**
>
> When explaining the calculation of the calendar, it seems inconceivable that the author would have omitted any reference to a fixed cycle of leap years if such a fixed cycle was already a part of the calendar. However, **Moses Maimonides**, who lived at 1200 A.D., and who also wrote very extensively about the calculations of the calendar, **makes clear references to this cycle of 3, 6, 8, 11, 14, 17, 19 in his work "Kiddusch hachodesh",** which was translated into Latin as early as 1683 by L. de Compiegne de Veil and then published in London. Therefore it is quite understandable that **Sachau felt that this sequence of 3, 6, 8, 11, 14, 17, 19 did not really become canonical until the time of Maimonides.**
>
> **The present Jewish calendar very possibly goes back to Hillel II** in the 350's A.D., though this understanding is only based on a statement by Hai Gaon, who died in 1038 A.D.. After Hai Gaon it is supported by others, including Maimonides at around 1200 A.D. **We should note that there is no proof, PRIOR TO HAI GAON, that the present calendar, with its sequence of leap years, does in fact go back to Hillel II.**

It is difficult to determine what Nelte actually believes. First, he appears to support the opinion that Hillel II fixed the calendar. Then he appears to discount this opinion. He fails to consider that if the present calendrical cycle has only been in use since Maimonides, none of his software is applicable, and his calculations of the holy days before Maimonides have no basis. Therefore, all arguments regarding Mar Samuel and Hillel II and Herman L. Hoeh are totally without foundation.

But if the present intercalary cycle does date back to Mar Samuel and Hillel II, then Nelte must explain why he is so opposed to a cycle that manifests a 3-3-2-3-3-3-2 leap year sequence and is so in favor of a cycle that manifests a 2-3-2-3-3-3-2 leap year sequence. Nelte, remember, would have run the 2, 5, 7, 10, 13, 16 and 18 year cycle down to 1825 AD—long past the days of Maimonides.

Nelte cannot validate this supposed earlier pattern of intercalation but rejects the present cycle because it allows the Passover to fall before the equinox. However, as we have demonstrated, the 3, 6, 8, 11, 14, 17 and 19 year cycle was in effect during the lifetime of Christ, and was His basis for observing the holy days.

Nelte sees a Passover observance before the vernal equinox as a problem. However, history records that the Passover of 5 BC fell before the spring equinox. This occurrence in the year of Christ's birth shows that it is not a problem in God's eyes for the Passover to fall before the equinox. Neither is the historical fact of a 216-year drift a problem, since it has never been a requirement for the Passover to fall on or after the equinox.

On one hand, Nelte rejects the rules of postponement as Jewish tradition, although the use of postponements is historically documented. On the other hand, Nelte supports the traditional Jewish interpretation of *Tekufot*, which the records of history clearly contradict. What then? Let us rely on the records of Scripture and history, not on the opinions of men.

# Chapter Nine

## The Basic Facts of Calendar Mathematics

Given the provable facts of history, coupled with the long extant documentation of Hebrew Calendar methods of calculations, we are left with the unavoidable conclusion that some form of whole day modification of the fractured count of the lunar cycle is necessary for any managed lunar-solar calendar system of the tracking of time.

The following facts are known:

1) A 19-year lunar cycle time mark was used from the time of Ezra until our current day.

2) The form and structure of that 19-year cycle was in use during the time of Jesus and the apostles. They did not object to its use as a basis for calendar declarations.

3) The time period of Nisan through Elul always contained 177 days for both common and leap years, with months, beginning at Nisan, which alternated between 30 and 29 days through the month of Tishri. The lengths of each month of this period have been fixed since at least the time of the second temple.

4) Leap years were incorporated 7 out of the 19 years of the cycle. This is a mathematical necessity.

5) All these facts being documented and provable from the Scriptures, as well as from historical data, we are left with no options to the necessity of some form of calendar rules which provide for the splitting of mathematical hairs in order to accomplish declarations. We may argue about the wording used to establish a definition of such operative formula for calculations, but

given the known facts, the necessity for some form of mathematical management cannot, by any reason of logic, be dismissed.

We could choose not to call such formulated process by the name of "postponements," however, there can be no provable or logic of mathematical sanity which provides for the elimination of the effect of postponements in some form. We either must use the rules already in place, or provide for a calendar court that sits to form a new system. If some method already existed in the Scriptures, Jesus would not have followed the lead of the calendar court of His day. During His life, He observed the Feast days as declared by the calculations of the Hebrew Calendar. This is a record of history none have been able to refute.

6) The necessity of some form of postponement rules can be easily deduced for the following reasons, which are purely mathematical.

7) The length of the lunar year is not only variable by the fact of the fractured cycle of 29.53 days, but also by the variable length of 12 to 13 months.

8) Since all periods of the festival season, year by year, have been fixed by the length of the 177 days of Nisan through the month of Elul, the fractured values of the 6th and 7th month lunar periods are thrown into the time external to the 6 months of Nisan-Elul, and must there be summed toward a desired average.

9) Therefore, 19 periods of 6 lunar months are fixed for each cycle, which amounts to 19 x 6 = 114 months, or 57 months of 30 days and 57 months of 29 days. Seven of the 19 years contain 13 months, which amounts to 13 x 7 = 91 months within the period of leap years. The months of leap years within the fixed intervals of Nisan-Elul amounts to 7 x 6 = 42 months. This leaves 49 months that are tossed into the fractured seven months of the 8th through 12th lunar month periods of leap years. So, what does this tell us?

10) Without the management of the listed postponement rules of the Hebrew Calendar, leap years would have lengths of either 383 or 384 days. But, we know that a 13-month lunar year, because of the fractured value of the lunar cycle, has an average length of 13 x 29.5305941 days, or precisely 383.8977 days. Also, we know that 177 days of this total are fixed, which leaves 383.8977 - 177 = 206.8977 days. This is a fractured number, which

must be used to declare leap years of either 383 or 384 days seven times in 19 years in an attempt to arrive at an approximate average of 206.8977 days for the seven-month periods of the seven leap years per cycle.

11) So, as is said, we don't need to be a rocket scientist to make a few simple calculations to see if any combination of 383 - 177 = 206 days, or 384 - 177 = 207 days, will produce our 206.8977 average for seven years. Our closest attainable value would be 207 x 6 = 1242 + 206 = 1448 days. Divided by 7 that becomes 206.85714 days. Even if we could force six out of seven years to land on 207 days for this period (with one at 206 days), this is still 0.89772 - 0.85714 = about 0.04058 days or about one hour short of the needed average. For one 19-year cycle this becomes 0.04058 x 7 = 0.28406 days. Sooner or later, this fraction of days forces the necessity of a decision to add some time to recover the loss of the lunar-solar drift with respect to the season.

Ultimately this decision cannot be avoided, so when that happens we need to call it something. That "something" man has chosen to identify as a postponement. This could be done at random as needed. The Hebrew Calendar has a set, managed system of doing this, which has reference to the seven-day week. We could choose some other form, but cannot avoid the fact that it must be done as a result of a fractured and variable lunar cycle, which must be declared by whole day numbers.

The next question is how does a similar model fall out for the 12-month common years of the 19-year cycle. The average span for a 12-month year is 354.367 days. So, the needed value for the variable time left to achieve this average is 354.36712 - 177 = 177.36712 days. Again, without adjustments, there are two lengths of lunar years for the 12-month spans. They are 354 and 355 days. How close can we come to the average value without postponements? The closest average of the two types of years is a combination of 4 times 355 combined with eight years of 354 days. This produces and average of 354.333 days, which is 0.36712 - 0.333 = 0.03412 days short per year, or 0.03412 x 12 = .40944 days short for per 19-year cycle.

Now, from the seven years of 13 months the closest we could come to the needed average was about 7 hours short over 19 years. Added to the shortage for the total loss of the 12-month spans, this amount to 0.28406 + 0.40944 = 0.69312 days or 16.64 hours short for 19 years. Since we

obviously could not allow for this continued loss of time, cycle after cycle, how do we make it up? We add to or "postpone" days in order to reclaim the lost time.

This stretching or elongation of time is accomplished by skipping, at times, both fractions and whole days of the week. Rule 1 skips whole days (i.e., Sunday, Wednesday and Friday), while Rules 2, 3 and 4 skip fractions of days by different lengths of time. Rule 2 spans the 6 hours from 12 noon to 6:00 PM, while Rules 3 and 4, when invoked, add 8.81 and 2.45 hours respectively, as referenced to the morning side of 12:00 noon for certain years when the Molad of Tishri falls on Monday and Tuesday mornings. The total combined increments of Rules 2, 3 and 4, in one manner of speaking, adds up to a gain of 6 + 8.81 + 2.46 = 17.27 hours, or about 72% of a day.

Of course, the close approximation of the loss of 16.64 and 17.27 hours gain added back is not offered here as conclusive proof of the way postponements work, since time by postponement rules is not added back equally by the four rules. But, the similarity possibly hints at some connection between the camps of time loss and gain. Too, it's entirely possible that some small percentage error of a constant used could close the gap between the 16.644 and 17.27 hours, offering in a sense, a small snapshot of the whole of calendar operation.

But again, without postponements only 354 and 355 day years are possible, which leaves either 177.367 or 178.367 days in the 6 months opposite the Nisan-Elul period. Obviously, we cannot count **by fractions**, so that leaves options of either 178 or 177 days from which to develop a 12 count interlace average of 177.367 days. No combination would ever hit that number precisely, any more than any combination of 206 and 207 days in seven leap years can attain exactly 206.8977 days for the 13-month lunar years. These are just mathematical facts.

The lunar month has no finite definition of span, but varies from about 29.25 to 29.80 days. So, the Hebrew Calendar calculates on the average of about 29.53 days. Since the month has no precise definition it should not be surprising that the year, being made of lunar months, neither has an exact value, but is variable (by rules of calendar calculation) from 353 to 385 days.

The four postponement rules combine to create additional lengths of

lunar years at 353 and 385 days, making six possible lengths in all. So, with postponements, we have years of 353, 354, 355, 383, 384 and 385-day lengths. This gives us the additional use of 176 and 208 days to average for the 12 and 13-month lunar years, respectively. Simple logic plainly reveals that it is never possible (with any system) to achieve a perfect match of the lunar phase with whole day numbers. But, the Hebrew Calendar produces the closest average attainable within the framework of the mathematical possibilities available. A different method would just produce another set of numbers that are less efficient than some presume the Hebrew Calendar to achieve.

The basic conclusion to the postponement issue is this. We need not search out every finite detail of any and all postponements, where they have and do occur in lunar declarations. The mathematics of the lunar cycles proves they will have to be included at some point in any lunar calendar. These obvious facts of astronomy leave us not with the question of "if" postponements existed at the time of Christ, but with only the argument of where they were then and yet still need to be placed. The "where and when" such adjustments were being incorporated during the time of Jesus, brought no objections either from Him or the New Testament church which He founded. Taking that lead, since there are mounds of documented evidence to prove we still have the very same 19-year cycle relationship of the sun, earth and moon as existed in Jesus' day, there seems to be little requirement for the need to revamp the calendar or its rules in our age.

# Chapter Ten

## Visibility and Postponements

There is a profoundly simple answer to the questions of many regarding the validity of postponements: It is an undeniable mathematical fact, that the ancient Calendar Court had no reason for existence aside from the fact that postponements of some form were included in the declaration of the feasts of God.

It is an impossibility both astronomically and mathematically to witness a visible crescent the evening going into Tishri 1 without the employment of postponements.

If the Calendar Court sat to hear the witness of the first visible crescent (which it did), then some form of postponement rules were (without question) in effect. Otherwise a crescent moon could never be visible on the eve of Tishri 1. Even with the employment of the rules of postponement, a crescent is not always visible, but is on some occasions. Thus, the fact of the witnesses of the ancient Calendar Court! The court witnesses would be able to view a crescent moon, only on those occasions when postponements, with respect to molad calculations, were active.

Tishri 1 is declared on Thursday more than any of the four days of possible days of declaration. Thursday is also the most oft declared lunar day of Tishri resulting from the postponement rules. Indeed, in some years the maximum window in hours for the declaration of a Thursday Trumpets is 56 hours 49 minutes. No other day of Trumpets declaration has this wide window of latitude.

This extended window of declaration for a Thursday Trumpets, finds about 50 to 60% of all sightings of a visible crescent on the eve of Tishri 1, falling on Wednesday evening. In fact, in the current 19 year time cycle, 75% of all visible crescent moons of Tishri, over Jerusalem, occur on

Wednesday evening—the eve of a Thursday Trumpets declaration. Visible crescents occur less frequently on declarations of Saturday and Monday, and quite rarely for Tuesday.

This Thursday window of Trumpets declaration actually opens after the passing of 9 hours, 203 parts (in applicable years). This is 56 hours and 1080 – 203 = 877 parts (we rounded it to 5 less at 882 for 49 minutes). Then, we have 56 hours and 49 minutes before 12:00 Thursday, for the window of Trumpets declarations. Again, sighting during this window of time are a direct result of the application of the rules of postponement.

Declarations of Tishri 1 occur most often on Thursdays falling in years of 355 and 385 days. These years are known as "abundant years" due to the addition of an extra day. While it is true that declarations of Tishri 1 may fall on other weekdays in years having 355 and 385 days, these declarations occur less frequently than those falling on the weekday of Thursday. Thursday is most often declared as Trumpets in these "abundant years"—the type of year which is most often declared under the visible crescent moon of Tishri 1.

All of this happens quite frequently as a direct result of the division of Tuesday, beginning at the 9th hour, 204th part—i.e., Rule 3. A division of the ninth hour at part 204 means that the hour is separated by 877 and 203 parts (877 + 203 = 1080).

So, we may ask, what does all of this have to do with the accuracy of the Hebrew Calendar? The wide window of the 56 hours and 49 minutes results in the most often declaration of Tishri 1, on the week day of Thursday--with the most often appearance of the new moon crescent on the eve of new moon day, and the most often full moon (by percentage of illumination) on the eve of Tishri 15 (also Thursday).

**JERUSALEM VISIBILITY TISHRI NEW MOON**

**CURRENT 19 YEAR CYCLE**

| YEAR | POSTPONED | VISIBLE on the Eve of Trumpets |
|---|---|---|
| 1997 | NO | NO |
| 1998 | NO | NO |
| 1999 | SINGLE | NO |
| 2000 | DOUBLE | YES, 3% |
| 2001 | NO | NO |
| 2002 | NO | NO |
| 2003 | SINGLE | NO |
| 2004 | DOUBLE | YES, 1% |
| 2005 | SINGLE (rule 4) | NO |
| 2006 | NO | NO |

**JERUSALEM VISIBILITY TISHRI NEW MOON**
(Continued)

| YEAR | POSTPONED | VISIBLE on the Eve of Trumpets |
|---|---|---|
| 2007 | DOUBLE (single) | YES, 1% |
| 2008 | SINGLE (NO) | NO |
| 2009 | NO | NO |
| 2010 | NO | NO |
| 2011 | DOUBLE | YES, 2% |
| 2012 | SINGLE | NO |
| 2013 | NO | NO |
| 2014 | SINGLE | NO |
| 2015 | SINGLE | NO |

Postponed = in reference to 12:00 noon, for the calculated *molad*.
Single = one day postponement past either the conjunction or *molad.*
Double = two day postponement past the calculated *molad* or conjunction.

Conclusions: 11 years /19 years = 58% of Tishri 1 dates postponed this 19-year cycle (the normal average for postponements is 61 %). Visibility at Jerusalem will occur only 4 times this cycle (2000, 2004, 2007 and 2011 Ad), and only for years in which a double postponement is active. This

amounts to a visibility percentage, at Jerusalem, on the eve of Trumpets, of only 4 years /19 years = 21% of the time this cycle. However, 75% of all visible crescents for the eve of Trumpets for this cycle occur on Wednesday—the eve of Tishri 1.

A sampling of Trumpets declarations for the years 1950 through 1970 AD produces results similar to the 19-year cycle of 1997 thru 2015 AD. In those 21 declarations, there were many postponements, but only 8 visible crescent moons on the eve of Tishri 1. In fact, if we count all postponed declarations as being past either the astronomical conjunction, and/or the calculated molad, there were 18 postponements in 21 lunar dates for Trumpets.

A crescent moon was visible on the eve of Tishri about 8 years /21 years = 38% of the time for the sampled span of 1950 to 1970 AD. Most of the visible crescents occurred in years with double postponements. **Visibility seldom occurs when Trumpets is postponed for only one day.** For all cases cited, in the samplings of 1950 thru 1970 AD, and 1997 thru 2015 AD, there were no observed crescent moons on the eve of Tishri, except in those years when postponements were active.

This is, of course, logical, since a visual sighting cannot occur until at least 17 hours have lapsed after the actual moment of the astronomical conjunction. According to calendar rules, if the calculated molad occurs before the 18th hour (i.e., 12:00 noon, Jerusalem time), then the day is normally declared. The exceptions would be those special cases which fall in the early morning hours of Monday and Tuesday, which can, for certain types of years, activate postponements. Molad calculations which fall on the week days of Sunday, Wednesday, or Friday, are automatically postponed by calendar rules. In any case, the point being that if the molad falls before noon on an allowed day of declaration, the day is declared. Hence, a calculated molad that falls, let's say, at 11:15 AM on Thursday would see that weekday declared as Trumpets.

If the actual conjunction of the moon took place at, let's say, 9:00 PM Sunday evening, for a given year, but the calculated molad fell at 12:10 PM, Monday, Jerusalem time, then that Tuesday would be declared Tishri 1, and it's quite possible that a crescent could be seen at sunset Monday evening, as this is some 21 hours past the conjunction of Sunday night. In such a case, there would be 15 hour and 10 minute difference between the actual

conjunction and the calculated molad of the Hebrew Calendar. But, since the molad fell at 12:10 PM, the declaration would be postponed until the following day, Tuesday. Remember, we have documented that historically only molad calculations—not the astronomical conjunction were used to declare the day of Trumpets.

Thus, as a result of a postponement, a crescent moon would become visible on the eve of Trumpets (Monday, sunset). This would not be possible without a postponement of at least one day, and seldom produces a new moon crescent even then. In most cases, a two-day postponement is necessary in order to have a crescent appear on the eve of Trumpets. The methods of the Hebrew Calendar always push the day of declaration towards the first visible crescent, though the actual fact is achieved little more than 30% of the time, though would appear at a higher percentage rate just before the end of the day of declaration.

The opposite extreme is that a purely observed calendar, which always waits for the appearance of the first visible crescent, would force the declaration of Tishri 15 (i.e., Tabernacles) past the day of the full moon more than 40% of the time. So, we have the evidence that the Hebrew Calendar attempts to strike a mathematical average between the new and full moon declarations, adjusting to the variable lengths of the lunar cycle, and the elasticity of the disproportionate ratios of the waxing and waning periods, by the rules of postponement.

# Chapter Eleven

## 30 AD and the First Visible Crescent

Some still apparently believe that both calculations and observation are in agreement for the years 5 BC and 30 AD. That is to say, that a crescent moon actually appeared on the horizon at sunset on the eve of Trumpets in Jerusalem, in the years which are coming to be accepted by many scholars and historians as the probable years of the birth and crucifixion of Jesus.

Nothing could be further from the truth.

In the year of Jesus' crucifixion a declaration of Nisan 1, based solely on the first visible crescent, would find the Passover of 30 AD falling on Thursday and not Wednesday. This places the resurrection about sunset on Sunday, with the Wave Sheaf count beginning on Monday in 30 AD.

Scriptural records place the Passover of Christ's crucifixion on a Wednesday, Nisan 14, 30 AD. Both the astronomical conjunction and molad calculations for 30 AD place Nisan 14 on Wednesday, April 5.

The astronomical conjunction of Nisan in 30 AD occurred at 10:20 PM (20:20 UT) Jerusalem Time, Wednesday, March 22. The molad calculation fell at about 10:00 PM, Wednesday, March 22, 30 AD. By either reckoning, Nisan 1 was then declared on Thursday, with the 14th on the weekday of Wednesday. This obviously means that no crescent moon appeared at sunset Wednesday, as the day began, since the moon did not even enter conjunction until almost four hours after sunset on the same day.

The first crescent then, did not occur until Thursday evening. If declaration were by visibility of the crescent, then Friday would have been the first day of Nisan, and hence, a Thursday, Nisan 14 Passover, and Sunday evening resurrection. So, we can see that some arguments, on the surface, seem to be logical until we try to match the conclusion to Scripture. Visibility does not work for the declaration of the holy days in the year of

Jesus' crucifixion, though, at times, according to the Hebrew Calendar, a crescent moon may be seen on the eve of the day of Trumpets. The Hebrew Calendar is not based solely on either the dark moon or the visible crescent 100% of the time. As is said, we call it the "calculated" Hebrew Calendar--not the Hebrew Calendar of the visible or invisible moon.

Though Hebrew Calendar methods aim for visibility by the end of the 1st day of the month, it is not attained all the time, due to the fluctuations of the lunar orbit. Since we have demonstrated a lunar calendar of fixed lengths for the months of the feast cycle in operation during the life of Christ, we can know that it was not based solely on the crescent moon or the astronomical conjunction before the time of Hillel II. Either case would require that the length of the lunar cycle be variable from month to month. This, as both Biblical and secular history records, was not the case; therefore we can logically conclude that months were, as they are today, calculated by the mean molad number of 29.53 days, with all months, from Adar through Tishri, alternating between 29 and 30 days, in that order.

The six-month feast season from Nisan to the declaration of Trumpets is technically 29.53 x 6 = 177.18 days. The Hebrew Calendar has locked this to an average number of 177 days.

On the other hand, a calendar based on either observation or the astronomical conjunction of the moon, can vary from 176 to 178 days in length for the period from Nisan to Tishri. The Hebrew Calendar then, by selecting 177 days, is accurate to within 177 divided by 177.18 which is equal to 99.90% of the time, while the other options just mentioned can only attain a 176 divided by 177.18 which is equal a 99.33% accuracy to a 177.18 divided by 178 which is equal to a 99.54% accuracy. For those who want to "split hairs," the Hebrew Calendar is then, on average, about 0.47% more accurate, by length of days for six lunar months, than a calendar that is either observed, or determined solely by the lunar conjunction or dark moon.

In 30 AD, the astronomical conjunction for Tishri occurred at 7:45 AM (05:45 UT), Saturday morning, September 16. The Feast of Trumpets began the previous evening at 6:00 PM, Friday, September 16, 30 AD. The hour of 6:00 PM is considered the calculation mark for the hour of declaration, even though the sun would virtually never set at this precise moment in time on the eve of Tishri 1.

Obviously, a crescent was not visible at 6:00 PM, Friday evening at the beginning of Trumpets, 30 AD, as the earth and moon did not reach conjunction with the sun until over 11 hours after the day was declared. Calculation, then, had to be the sole determinant for declaring the Feast of Trumpets in 30 AD. The molad of Tishri occurred on Saturday, 8 hours and 352 parts. The Hebrew Calendar calculated molad numbers, of course, are not directly related to visibility, and seldom (if ever) agree with the exact time of the lunar conjunction. But, even if the Hebrew Calendar calculations gave us a direct indication of visibility, and of course, the Hebrew Calendar rules make no such claim, they would definitely disallow visibility for the 30 AD.

True, observatory calculations for that era guarantee about a 2 to 4 hour window of accuracy, but these facts are still far from any possibility of a crescent moon at Jerusalem for the mentioned dates. The record for visibility of a crescent moon, without the assistance of optics (i.e., telescope, etc.) is about 17.2 hours, following a known lunar conjunction. By any known standard, then, calculations had the final say in determining the date of Trumpets, 30 AD.

| | |
|---|---|
| Date of Astronomical Conjunction: | 30 AD, Saturday, September 16 |
| Time of Astronomical Conjunction: | 7:45 AM, Jerusalem Time |
| Molad of Tishri: | $7^{th}$ day 8 hours and 352 parts |

Let's take these findings one-step further in pursuit of a related question. So far we have quoted data from the month of Tishri in the year 30 AD. But, an obvious secondary question related to lunar declarations of these years is this. What about the declaration of Nisan 1 in 30 AD? The declaration of Tishri was based totally on the rules of calculations, but the question yet remains; what did the witness runners of Nisan see in the same years, six-months previous to the declaration of Trumpets?

This is not a matter of being right or wrong, but merely a search of the mathematical, astronomical truth. The acquirement of the knowledge of past and present events, within the realm of a close, reasonable tolerance, is becoming rather commonplace in the age in which we live. It's just not all that mysterious or difficult to extract the tables of astronomical cycles from

the pool of man's resources, and, to ascertain, on what date and day of the week a given event occurred in ancient history.

Here, then, are the relative stats for the lunar calculations surrounding Nisan 1 of 30 AD. Such sources, easily available to us, have no axe to grind one way or the other in relation to the Hebrew Calendar. The following known calculations are thus provided, and, since visibility is primarily based on finite astronomical functions of time, the mean Hebrew Calendar calculations, in this case, are not relative or provided:

| | |
|---|---|
| Date of Astronomical Conjunction: | Wednesday, March 22, 30 AD |
| Time of Astronomical Conjunction: | 10:20 PM, Jerusalem Time |
| Nisan 1: | Thursday, March 23, 30 AD |

The year of 30 AD can hardly be up for discussion as to the possibility of a visible crescent on the eve of Nisan, as the conjunction did not even occur until about two hours after sunset on the day of declaration. All of this plainly demonstrates that calculations prevailed over any possibility of visibility in the very years of both the birth and crucifixion of Jesus.

# Chapter Twelve

## The Impossibility of a Wednesday Passover in 31 AD

For nearly 50 years, major branches of God's church have taught that Jesus was crucified on Wednesday, April 25, 31 AD. However, as we demonstrated earlier in this paper (see Chapter Five), it was the misapplication of an intercalary pattern with leap years 2, 5, 7, 10, 13, 16 and 18 of the 19-year cycle that yields a Wednesday Nisan 14 for 31 AD. We say misapplication because in reality leap years 2, 5, 7, 10, 13, 16 and 18 of a 19-year cycle and leap years 3, 6, 8, 11, 14, 17 and 19 of a 19-year cycle relate to the same year BC or AD in the cycle.

We have also demonstrated that a 3, 6, 8, 11, 14, 17 and 19 year pattern was utilized by the Hebrew Calendar at the time of Christ. **It is thus impossible for either pattern to have yielded a Wednesday Passover for 31 AD.** As we learned in Chapter Five, the debate was not over the order of leap years within each 19-year cycle, but rather the year of creation—the epochal molad. All leap year sequences of a 19-year cycle therefore relate to the same given year in that cycle. In 31 AD, for example, a leap year cycle beginning in year 2 of epochal molad 3760 BC and a leap year cycle beginning in year 3 of epochal molad 3761 BC both equate to 23 AD. From 28 AD through 36 AD there was one, and only one occurrence of a Wednesday Passover for this entire period. That was the year 30 AD.

How then did the grossly mistaken date of 31 AD come to be so widely accepted as the year of Christ's crucifixion? As we will see, two major false assumptions were used to arrive at the false date of crucifixion of 31 AD.

The first error was that there was a supposed change in the intercalary cycle in 161 AD. There was no change in the cycle. Sometime before 140 AD the intercalary cycle with a 3, 6, 8, 11, 14, 17 and 19 year pattern was interrupted by the bar Kokhba war. Thus, sometime after 140 AD this intercalary cycle was reinstated, that's all that happened, the pattern was

never changed from a 3, 6, 8, 11, 14, 17 and 19 year pattern to a 2, 5, 7, 10, 13, 16 and 18 year pattern.

The second error was that the above-assumed intercalary pattern of years 2, 5, 7, 10, 13, 16 and 18 of each 19-year cycle was affixed to different years AD than those of a 3, 6, 8, 11, 14, 17 and 19 year cycle. Thus the 19-year cycle of Christ's crucifixion it was asserted that years 22 to 38 AD instead of 23 to 39 AD were the years of intercalation. This error falsely classified 30 AD as a leap year, which then pushed the date of Passover 31 AD to a Wednesday, April 25.

| **3761 BC** | **3760 BC** | **3759 BC** | **3758 BC** | **Intercalary cycle Common to All** | |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | 1 | | | | |
| 3 | 2 | 1 | | X | 23 AD |
| 4 | 3 | 2 | 1 | | |
| 5 | 4 | 3 | 2 | | |
| 6 | 5 | 4 | 3 | X | 26 AD |
| 7 | 6 | 5 | 4 | | |
| 8 | 7 | 6 | 5 | X | 28 AD |
| 9 | 8 | 7 | 6 | | |
| 10 | 9 | 8 | 7 | | |
| 11 | 10 | 9 | 8 | X | 31 AD |
| 12 | 11 | 10 | 9 | | |
| 13 | 12 | 11 | 10 | | |
| 14 | 13 | 12 | 11 | X | 34 AD |
| 15 | 14 | 13 | 12 | | |
| 16 | 15 | 14 | 13 | | |
| 17 | 16 | 15 | 14 | X | 37 AD |
| 18 | 17 | 16 | 15 | | |
| 19 | 18 | 17 | 16 | X | 39 AD |
| 1 | 19 | 18 | 17 | | |
| 2 | 1 | 19 | 18 | | |
| 3 | 2 | 1 | 19 | X | 42 AD |

These errors were compounded by the fact that many in the early days of the church simply believed that the Passover of the crucifixion of Jesus occurred in the year of 31 AD. Why? Because there was a strong belief that an event that occured in 1931—the beginning of the Radio

Church of God, occurred 100 19-year time cycles (1900 years) after the supposed beginning of the New Testament church in 31 AD.

This attempt to have the Passover of the crucifixion occur in 31 AD was probably born out of good intentions. Nevertheless, a 31 AD crucifixion also stemmed from the work of scholars who had not thoroughly researched the subject. We need not assign some great fault for this conclusion as it was likely based on good motives. Today, we simply live in a time of increased knowledge, and can more finitely define many events of calendar chronology which were not evident some 50 or more years ago.

These false assumptions were then employed to prove that postponements were in force during the time of Christ. Postponements were indeed active at that time, but we don't need to bend the truth to validate their existence! All of this has resulted in a great deal of anguish, confusion, and frustration for any who have attempted to understand the calendar question. The answer to the whole riddle is so simple that it's almost humorous.

It is a myth to believe that calendar changes have somehow altered declarations in respect to days of the week, for this is impossibility. Furthermore some have assumed that this supposed change of the pattern of intercalation was instituted in order to effect a seasonal adjustment. They assume this seasonal adjustment was needed to insure a closer alignment of Passover with the vernal equinox. A similar debate in the 4$^{th}$ century was finally resolved at the Council of Nicea in 325 AD, **and later dubbed with a fitting name—Easter!**

# Chapter Thirteen

## New Moon, Full Moon and the 177 Day Elliptical

Given the fact that the lunar month is less than 30 days, by the fractional deficiency of 0.47 days, we cannot logically expect to see an always perfect alignment of the 15th day of every lunar month with the full moon. And, by the same token, there would not always be a perfect coincidence of a lunar eclipse with the 15th day and full moons. To further complicate matters the month varies between about 29.25 and 29.80 days, with the average falling at about 29.53 days. So, as stated, the actual month, on average is some 30 - 29.53 = 0.47 days short of an even division of 30 for a perfect 15th full moon.

This division of 29.53 falls at 14.765 days in the lunar cycle, which means the full moon, on average falls at roughly the 77% mark of the 14th day. Hence, it misses a perfect 15-day mark by about 23% of the day, or about 5.52 hours. This figure rounded off to the nearest whole is 6 hours. So, we can see here another hint of Rule 2 of the postponement schedule, because if we back up 6 hours from the full count mark at the beginning of **the 15th** that becomes 12 noon, or 18 hours after 6 PM the previous evening. This is a very logical formulation, which also tracks with the 18-hour mark of the declaration of new moon day by calculation.

Now we can easily see the evidence of calendar rules which aim at hitting the best average mark for both new and full moon declarations. Such rules deal with the logic of a month, which, by average is short of 30 days. Based on these obvious data of known facts, we should expect to see a similar pattern of logic when checking to see how well a given lunar calendar tracks the new and full moon days with reference to mathematical and astronomical law.

Declarations which disagree with mathematical logic would surely be a valid reason to question the accuracy of any lunar calendar. Therefore,

based on pure fact, we should expect to see a pattern of lunar declarations which favor dates that appear to err slightly on the side of too early. Why? Such apparent error would have to be an illusion rather than fact because since the half cycle of the moon (with waxing and waning periods that are also variable) is almost 6 hours less than half of 30, we would logically expect to see full moon declarations that fall (by whole number of days) on the 14th or 15th of the month rather than on the 15th and 16th.

If we look at the declarations of the calculated Hebrew Calendar this is precisely what we see. That is, most declarations of the full moons of Nisan and Tishri fall either on the 14th or 15th. Since both the length of the lunar month as well as the balance of the division of the waxing and waning periods are variable, on some occasions the full moon may actually fall on the 16th by comparison of the whole numbered day and the lunar phase. But, this is an exception to the average rule and not the normal.

The logical normal demands that, on average the full moon by exact phase should fall either on the **14th or 15th**. In 61 AD, for instance, the precise full moon of Tishri actually fell on the 16th day of the month. Both molad and conjunction times, by 12:00 noon rule would agree on a declaration of Thursday by day of the week for that year, resulting in **a 15th moon** that was slightly on the side of still waxing toward full. However, a declaration by observation would have pushed the declaration even further along in the week to Saturday, thus resulting in the full moon (by observation of the first crescent) that would not occur until Tishri 17. So, logically, the Hebrew Calendar methods were, and still are, the most accurate.

The moon's phase tracks on a 177 day elliptical when we look at the records of the lunar eclipse. The Hebrew Calendar methods follow this same line of thought. That is, an eclipse that might occur in the spring on Nisan 14 might logically occur again on Tishri 14 of the same year. The same would apply for the 15th and 16th eclipse dates. By this view of tracking the mathematics of astronomical logic, the Nisan-Elul period has been set at 177 days.

This also provides that the Nisan - Tishri full moon eclipse would fall at the 177-day interval. Why is this an important point? Well, in order to accomplish this logical sheet of balance for calendar declarations, it is necessary to establish an order of fixed lengths for the months bordering the

177 span. Therefore, we would not expect to begin Nisan with 30 days, followed by an alternation of 29 and 30 days months (which add up to 177), but then decide later on in the summer to have both Ab and Elul fall out at 29 days each. Why? Because now we have messed up the elliptical of 177 by reducing it to 176 days, as a result of modifying Ab from 30 to 29. Not logical according to astronomical and mathematical concepts which must deal with whole numbers when coming up with dates of declaration based on a lunar span that is quite fractured.

The Hebrew Calendar is a straightforward, logical machine. Other lunar options pose many obstacles, making it quite difficult, as is said, "to get there from here."

# Chapter Fourteen

## Mathematical Spans of the Hebrew Calendar of 5 BC to 70 AD

There are two mathematical spans that run from 5 BC to 70 AD. The first span of 35 years runs from 5 BC to 30 AD and the second span of 38 years runs from 31 AD to 69 AD. These spans are another proof that the Hebrew Calendar was carefully designed. Time spans between lunar and solar dates have a given mathematical range of the possibilities of length by number of days. These spans can be calculated and demonstrated to be a valid proof of lunar declarations between spans when at least one lunar date has been documented and verified.

We can validate these spans by historical and astronomical dates, and by Scriptural dates such as the known declarations of Trumpets for years such as 5 BC, 30 AD, 66 AD and 69 - 70 AD. Since we can know the mathematical limits of the time span of days for a given number of years, it becomes possible to verify lunar dates of the Hebrew Calendar declarations by reference to known time spans.

In some cases, these same mathematical principles also clearly demonstrate which rules of postponement were in force for specific declarations. This can be done. It is not a mysterious, vague unknown substance of lunar calendar dates. No guessing game at all.

A good example would be the span between 31 and 69 AD. We know by fact of history that the second temple began to be burned on Saturday, Ab 9, 70 AD. We can know for sure that Trumpets fell on the week day of Monday in that year, otherwise the 9$^{th}$ of Ab did not fall on the Sabbath as history records that it did. We also have ample proof that the leap year pattern cycle of that era was precisely the same as it is today, according to the rules of the calculated Hebrew Calendar.

Since Trumpets was declared on Tuesday in 69 AD, we know that year

was one of 384 days—i.e., 69 - 70 AD. The molad fell Monday evening in 70 AD so Trumpets was rightly declared on Tuesday in 69 AD. Rule 2 was in play in 70 AD, and Tishri 1 was declared according to molad time, not by astronomical conjunction, since the lunar conjunction actually occurred well before noon on Monday. If we want to say that Trumpets was declared on Monday instead of Tuesday in 69 AD, then it must be accepted that 69 - 70 AD had 385 days (a leap year), since Trumpets, 70 AD was likewise declared on Monday. This is seven full days of the week between two adjacent years and that can ONLY happen with a 385-day year.

Moreover, it is impossible to have 385-day years without Rule 1 being active in calendar declarations. Rule 1 prevents Trumpets from falling on Sunday, Wednesday, and Friday. Years of 353 and 385 days NEVER occur without Rule 1 being active--it is an impossibility. So, any who object to postponements still cannot disprove the fact of mathematical law and mathematical law will only agree with the Hebrew Calendar for the declarations of both 31 and 69 AD.

Why is this significant?

Because the mathematical progression by days of the week for 38 years cannot be less than four week days. If an older pattern of intercalation is accepted in order to have Trumpets fall on the weekly Sabbath in 31 AD, and we want to declare Trumpets on Monday (according to astronomical conjunction before noon) in 69 AD, we have a real problem. Saturday to Monday is only two-week days of progression, which cannot mathematically happen in a 38-year span. If we want to say okay, Trumpets was declared on Tuesday in 69 AD, but on Saturday in 31 AD, it still doesn't work because this is only three days of forward rotation in 38 years.

Again, a minimum of four days is required. Why? Well, 365.2468 days x 38 years = 13,879.379 days, or 1982.768 weeks. The fraction, 0.768 weeks is 5.376 days of forward rotation in 38 years. The allowed time is then at least 4 days, with a maximum of 7 days or one full week. But, never could there be less than four full days of time between days of the week in 38 years.

The span of 38 years is exactly 470 lunar months, which is 13,879.379 days--the same as 38 multiples of solar years. Three days would be 2.378 days short of that lunar average. A maximum of only two less is

mathematically possible, therefore the variable is between 13,878 days for a minimum and 13,881days for a maximum mathematical span of 38 years. The minimum number of 13,878 days is a four-day forward rotation in days of the week between 31 and 69 AD.

A Thursday declaration in 31 AD and a Tuesday declaration in 69 AD is 5 days forward in the week (13,879 days), which is okay. But, if we move Trumpets to Saturday in 31 AD, we lose two days of the span, thus pulling back to only a three-day advance between 31 and 69 AD (for 13,877 days). If we then move Trumpets 69 AD back to Monday instead of Tuesday, the time becomes only a two-day span (i.e., 13,876 days), which simply does not work. No way could the lunar average drop that low in a 38-year span. The variable must be between a four and seven day advance by days of the week for a thirty-eight year span. Therefore, we can be assured that a Trumpets declaration never occurred on Saturday in 31 AD, but was declared exactly as the Hebrew Calendar validates, being on Thursday in 31 AD and on Tuesday in 69 AD, for an advance of 5 days—dead on target within the window of mathematical law.

There can be no argument about Hebrew Calendar declarations by molad time. In every example of historical record it checks out every single time.

## 26-32 AD Span

When postponement Rule 3 of the calculated Hebrew Calendar is activated by a molad falling only a few minutes past 3 AM or later on the weekday of Tuesday following a leap year, the declaration of Tishri is tripped to Wednesday, and then further kicked to Thursday by activation of postponement Rule 1. To many even one day of postponement is something akin to witchcraft, so how in the name of calendar sanity do we explain a full 48-hour instant jump from the wee hours of Tuesday all the way to Thursday? Is this some tangled plot stemming from drunken rabbis of an ancient Calendar Court, or rather is it the result of simple mathematical necessity?

A check of three declarations of the New Testament era reveals the amazing truth. These dates are Tishri 1 of 26, 32, and 70 AD. The period 26 to 32 AD is a six-year span of 75 lunar months and the span 32 to 70 AD is 38 years, or precisely two 19-year cycles, totaling 470 months. The first

period, because of the placement in the 19-year cycle, contains a spare month, or 3 years of 12 months and 3 years of 13 months. This is so because 26 to 32 AD spans years 6 through 11 of the 19-cycle, bridging 3 leap years.

If we chose years 27 to 33 AD, years 7 through 12 of the cycle would be spanned, resulting in only two leap years combined with four common years for a total of six years. This is important to observe because it means that six-year spans can have either 74 or 75 months, while 38-year spans, as is our example of 32 to 70 AD, is an exact multiple of 19 years will ALWAYS total 470 months.

With all this in mind, let us look at the interesting declarations of 26, 32, and 70 AD to see that they are spectacular as an example of how and why Rules 1 and 3 are indeed necessary and not some whim of a Judaic Calendar Court of rabid rabbis.

Again, the span of 26 to 32 AD is a six-year span of 75 lunar months, consisting of 3 years of 12 months and 3 years of 13 months. We know that the year 26 AD was declared two days past the molad of Saturday as the result of a two-day postponement activated by Rules 2 and 1 in that order. Therefore, Trumpets was proclaimed on Monday in 26 AD. The declaration of 32 AD was also declared two days past the molad of Tuesday as a result of a two-day postponement activated by rules 3 and 1 in that order. Therefore, Trumpets was proclaimed on Thursday in 32 AD. Why was this necessary and why not just declare Tuesday, the day of the molad, which fell well before noon? The answer is rather obvious when we do some simple math.

The average length of a lunar month is 29.53059 days. A span of 6 lunar years of 74 months would be 2,185.26 days in length (length of average month 29.53059 x 74 months = 2,185.26 days). In a span of 6 years including 3 leap years we have an additional month over a 6-year span with only 2 leap years. Thus a span which includes 3 leap years such as the 26 to 32 AD span, makes the total 2,185.26 days + 30 days which = 2,215.26 days. So, while a 6-year span of 74 months has a total of 2,185.26 days, a 6-year span with 3 leap years has a total of 2,215.26 days. An extra month of 30 days is added each leap year. This extra month, Adar II, is always 30 days in length, and is part of the averaging process of calendar law, which was in use at the time of Christ.

So, to determine on which day of the week Trumpets 32 AD occurs, we must simply determine how many days to add to Monday, Trumpets 26 AD. We do so by reducing the number of days between Trumpets 26 AD and Trumpets 32 AD to weeks and then reducing the remaining fraction to days. When we therefore divide 2,215.26 days by 7 days in a week we reduce the figure to 316.465 weeks. By then multiplying the fraction .465 by 7 days in a week we obtain the figure of 3.25 days to add to Monday, Trumpets 26 AD. Since calendar days are not declared by fractions, but by whole numbers, as are the days of the Gregorian calendar by which we live, we drop the fraction of .25 to obtain the final number of days to add. Beginning with Monday and adding 3 days we go through Tuesday, Wednesday and finally arrive at a Thursday Trumpets, 32 AD.

Now remember, the calculated molad of Tishri for 32 AD fell on a Tuesday, September 23 in 32 AD. But Rule 3 kicked in to trip the molad to Wednesday, September 24, 32 AD and because the molad fell on a Wednesday, Rule 1 kicked in to trip the molad to Thursday, September 25, 32 AD to reflect the reality of the actual number of days in this 6-year span! As we have just demonstrated, there was no rabbinic hanky panky going on here, just simple calendar arithmetic—no tricks or slight of hand involved for the sake of convenience of worship.

Such mythology, that Rule 1 was activated for the convenience of worship, is the sole fabrication of rabbis who had not one clue as to how the calendar actually worked. These elementary debates are recorded in the Talmud between Babylonian rabbis who had no authority or knowledge to decide calendar matters, nor were they privy to the secrets of calculation utilized by the authority in calendar affairs—the calendar court of Palestine. Hillel II did not reveal these secrets until 358 AD.

## 32-70 AD Span

But if this is not sufficient proof, let's go one step further. We know that according to calendar rules and by historical account the Feast of Trumpets in 70 AD was declared on the weekday of Monday. This proof we presented at the beginning of this paper. The span between 32 AD and 70 AD is 38 years or two 19-year spans. The total passage of time by number of months is 2 19-year cycles times 235 months for each cycle or 470 months. Since this span is precisely two 19-year periods, there is no

variableness in the length of the span. Thirty-eight years is always 470 months.

To proceed, 470 months times the average number of days in a lunar month 29.53059 = 13,879.379 days for the period from Trumpets 32 AD to Trumpets 70 AD. As we did above, this span in days reduces to 1982.7684 weeks. The fraction of 0.7684 can be reduced to days by multiplying it by the number of days in a week—7 days, which equals 5.378 days forward in the week for the declaration of Trumpets 70 AD, as compared to Thursday, 32 AD.

The nearest whole day declaration of five days forward from 32 to 70 AD would place the declaration of Trumpets on Tuesday, 70 AD, but as we know, it is logical, in some cases, because of the variable of the lunar cycle, to have about one day less to one day more than the target number of calculation. In this case (70 AD) the molad fell on Monday, and this being 4 days forward from 32 AD, the day was declared. However, if the postponements of 32 AD were disallowed, the span 32 - 70 AD would be increased to a six-day forward rotation or 13,880 days.

Let us now launch into a detailed reconstruction of *The Calendar of Christ and the Apostles*. We will flesh out each 19-year cycle that runs from the period of 18 BC to 77 AD by filling in the intercalary cycles, festivals that occurred before the equinoxes and by identifying postponements associated with leap years.

# Chapter Fifteen

## 19-Year Cycle One
## 18 BC to 1 AD

| Cycle Year | Civil Year | Year BC | Intercalary Year | Year Length | Nisan 14 On/Before Equinox | Tishri 22 On/Before Equinox | Rules Used |
|---|---|---|---|---|---|---|---|
| 1 | 3744 | 18 | | 355 | | | |
| 2 | 3745 | 17 | | 354 | | | 1 |
| 3 | 3746 | 16 | 1 | 383 | | 9/25 | 2 |
| 4 | 3747 | 15 | | 355 | | | |
| 5 | 3748 | 14 | | 354 | | | |
| 6 | 3749 | 13 | 2 | 385 | 3/20 | 9/21 | |
| 7 | 3750 | 12 | | 353 | | | 1 |
| 8 | 3751 | 11 | 3 | 385 | | | |
| 9 | 3752 | 10 | | 354 | | | 1 |
| 10 | 3753 | 9 | | 355 | | | 2 |
| 11 | 3754 | 8 | 4 | 383 | | | 1 |
| 12 | 3755 | 7 | | 354 | | | |
| 13 | 3756 | 6 | | 355 | | | |
| 14 | 3757 | 5 | 5 | 385 | 3/22 | 9/23 | 2 |
| 15 | 3758 | 4 | | 353 | | | 1 & 2 |
| 16 | 3759 | 3 | | 354 | | | |
| 17 | 3760 | 2 | 6 | 385 | 3/19 | 9/20 | |
| 18 | 3761 | 1BC | | 355 | | | 1 |
| 19 | 3762 | 1AD | 7 | 383 | | | |

# The Calendric Events of 5 BC

The Feast of Trumpets for 5 BC, the year of Jesus' birth, was declared for Saturday, September 2. The astronomical conjunction occurred on Friday, September 1 at 10:47 PM (20:47 UT) Jerusalem time. The molad of Tishri, civil year 3757, occurred at 23 hours and 219 parts on Friday, September 1 at 5:12 PM (15:12 UT) Jerusalem time—52 minutes before sunset. Thus, Trumpets was postponed by Rule 2* from Friday to Saturday.

When we subtract the time of sunset (6:03 PM) Jerusalem time from the time of the astronomical conjunction (10:47 PM) we can see that the Feast of Trumpets was already 4 hours and 44 minutes old. Obviously, a crescent was not visible at Trumpets, 5 BC as the day was some 4 hours, 44 minutes old when the astronomical conjunction took place.

**This makes the possibility of a visible crescent moon at sunset a complete impossibility in that year, though a crescent may have been seen near sunset at the end of the same lunar day; i.e., Trumpets.**

Calculation, then, had to be the sole determinant for the declaration of the day. Molad times are not directly related to visibility, and seldom, if ever, agree with the exact time of the lunar conjunction. Interestingly, the molad preceded the astronomical conjunction by more than four hours. But, even if the rules of calculation gave us a direct indication of visibility, for which the calendar makes no claim, they would definitely disallow visibility on the eve of Trumpets for 5 BC.

While it is true that observatory calculations for 5 BC guarantee a 2 to 4 hour window of accuracy, this fact is still far from any possibility of a crescent moon at Jerusalem. The record for visibility of a crescent moon, without the assistance of optics (i.e., telescope, etc.) is about 17.2 hours, following a known lunar conjunction. Thus, calculations had the final say in determining the date of Trumpets, 5 BC.

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*** Rule 2:** When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

Let's take these findings one-step further in pursuit of a related question. So far we have quoted data from the month of Tishri in the year 5 BC. But, an obvious secondary question related to lunar declarations of these years is this. What about the declaration of Nisan 1 in 5 BC? The declaration of Tishri was based totally on the rules of calculations, but a question yet remains; what would the witness runners of Nisan see in the same year, six-months previous to the declaration of Trumpets?

This is not a matter of being right or wrong, but merely a search for the mathematical, astronomical truth. The acquirement of the knowledge of past and present events, within the realm of a close, reasonable tolerance, is becoming rather commonplace in the age in which we live. It's just not all that mysterious or difficult to extract the tables of astronomical cycles from the pool of man's resources, and, to ascertain, on what date and day of the week a given event occurred in ancient history.

Here, then, are the relative stats from the U.S. Naval Observatory, for the lunar calculations surrounding Nisan 1 of 5 BC. Such sources, easily available to us, have no axe to grind one way or the other in relation to the Hebrew Calendar. The following known calculations are thus provided, and, since visibility is primarily based on finite astronomical functions of time, the molad of Nisan as calculated by the Hebrew Calendar, in this case is not relative or provided.

Nisan 1 for 5 BC was declared for Thursday, March 9. The astronomical conjunction occurred on Wednesday, March 8 at 9:24 AM (07:24 UT) Jerusalem time. Based on these facts, a best-case possibility of a visible crescent on the eve of Nisan 1 would have occurred in the year 5 BC. But since 9:24 AM to 6:00 PM allows for only 8.5 hours from the astronomical conjunction to the possibility of a crescent moon at sunset, we must conclude that a visible crescent was not seen (i.e., at least 17.2 hours is required). We have no known historical documentation of a visible crescent moon that appeared only 11 hours after the lunar conjunction.

**All of this plainly demonstrates that calculations prevailed over any possibility of visibility for Nisan 1 in the year of the birth of Jesus.**

We must call your attention to a few more things before leaving the 5 BC period. Much ado has been made by a great many over postponements,

especially postponement Rule 1. These hawkers of a no-postponement calendar continually bark their snake oil message that postponements are un-Biblical, of Satan himself and are nothing less than the evil fabrications of Hillel II—believed by them to be none other than rabbi demento.

Postponement Rule 2 was invoked to advance Trumpets from Friday to Saturday in 5 BC at the very time of the birth of our Savior. This also means that Atonement was advanced from Sunday, September 9 to Monday, September 10—363 years before Hillel II. Based on the historical and astronomical facts, there is no other conclusion we can reasonably draw. The molad, remember, occurred on Friday, September 1 in 5 BC. Yet the Hebrew Calendar declared Trumpets on Saturday.

Perhaps this would be a good time to review those facts. It is a fact of astronomy that a great total eclipse of the moon occurred on the night of Friday, September 15, 5 BC. A Hebrew Calendar utilizing a 3, 6, 8, 11, 14, 17 and 19 year intercalation sequence places the High Sabbath of the Feast of Tabernacles 5 BC on Saturday, September 16—a calendar utilizing a 2, 5, 7, 10, 13, 16 and 18 year intercalation sequence places the High Sabbath of the Feast of Tabernacles 5 BC on October 16. There was no lunar eclipse on October 16! This definitely rules out the use of a 2, 5, 7, 10, 13, 16, 18 year intercalation sequence.

Furthermore, may we remind you that 5 BC is also the 14$^{th}$ year of that 19-year cycle as well as the 5$^{th}$ leap year of the cycle. As we have already demonstrated, a 3, 6, 8, 11, 14, 17 and 19 year cycle agrees perfectly with the historical data for 66, 69 and 70 AD. And, of particular importance is the fact that 69 AD was also the 4$^{th}$ leap year of that 19-year cycle; i.e., year 11.

We thus have a cyclical lock on leap year patterns from 5 BC to 66 AD and 69 AD based on firm historical and astronomical data. Calendar declarations using this leap year cycle for this 75 year period are therefore valid—Trumpets 5 BC was postponed by **Rule 2*** whether we wish to

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*** Rule 2:** When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

believe it or not. Trumpets was not declared by observation or by the astronomical conjunction, but rather by a molad that fell late on a Friday evening and was therefore advanced to Saturday.

There is one last thing we would like to call to your attention and then we will move along to examine the next 19-year cycle. Based on the forgoing evidence and the calculations of the Hebrew Calendar, the Tishri 22 in 5 BC was celebrated on Saturday, September 22. The entire Feast of Tabernacles season of the year of Jesus' birth was over a full two to three days before the fall equinox. Oh, by the way, Passover 5 BC was celebrated the night of March 21. The earliest date for the spring equinox at this time was March 22.

For 5 BC, the year of Jesus' birth, we can conclude the following:

5 BC was the 14th year of a 19-year cycle (it is impossible to have a luni-solar calendar without 19-year cycles).

5 BC was also intercalated—meaning a second Adar was added. It was the 5th of such years in the sequence of 3, 6, 8, 11, 14, 17 and 19 (19-year cycles must be intercalated, it is just a matter of applying the right sequence).

Nisan 1 was declared by calendric calculation of Tishri 1 and the 177 day rule—not by observation, astronomical conjunction, star charts or the barley harvest.

Tishri 1 was declared by calendric calculation, including the activation of Rule 2—not by observation, astronomical conjunction or star charts.

Atonement was advance from a Sunday to a Monday observance By the postponement of Trumpets by Rule 2 and that for Mathematical reasons based on the cycle of the 7-day week—not for liturgical reasons.

The Passover was celebrated before the spring equinox in 5 BC.

The Feast of Tabernacles and Tishri 22 were celebrated before the fall equinox in 5 BC.

## The Calendric Events of 2 BC

The astronomical conjunction occurred at 8:40 PM (18:40 UT) Jerusalem time, Saturday, August 29, 2 BC. The molad of Tishri occurred on Saturday, August 29 at 14 hours and 400 parts. Trumpets was declared for Saturday, August 29, 2 BC. Passover day fell on March 19 in 2 BC, a good 2 to 3 days before the spring equinox. The celebration of Tishri 22 in 2 BC was observed on September 19 a full 2 to 3 days before the fall equinox.

## The Calendric Events of 1 BC

The astronomical conjunction occurred at 6:12 PM (16:12 UT) Jerusalem time, Thursday, September 16, 1 BC. The molad of Tishri occurred on Friday, September 17 at 11 hours and 989 parts. Rule 1* was activated due to the fact that the molad fell on a Friday and the molad was moved to Saturday. Trumpets was declared for Saturday, September 18, 1 BC. Thus it is the postponement of 1 BC which advances the span of Trumpets 5 BC to Trumpets 1 BC from 1476 to 1477 days.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

# Chapter Sixteen

## 19-Year Cycle Two
## 2 AD to 20 AD

| Cycle Year | Civil Year | Year AD | Intercalary Year | Year Length | Nisan 14 On/Before Equinox | Tishri 22 On/Before Equinox | Rules Used |
|---|---|---|---|---|---|---|---|
| 1 | 3763 | 2 | | 354 | | | 2 |
| 2 | 3764 | 3 | | 355 | | | |
| 3 | 3765 | 4 | 1 | 385 | | 9/25 | 1 |
| 4 | 3766 | 5 | | 354 | | | 1 & 3 |
| 5 | 3767 | 6 | | 353 | | | 1 & 2 |
| 6 | 3768 | 7 | 2 | 385 | 3/21 | 9/22 | |
| 7 | 3769 | 8 | | 354 | | | |
| 8 | 3770 | 9 | 3 | 383 | | | 1 |
| 9 | 3771 | 10 | | 355 | | | |
| 10 | 3772 | 11 | | 354 | | | 1 |
| 11 | 3773 | 12 | 4 | 385 | | | |
| 12 | 3774 | 13 | | 353 | | | 1 & 2 |
| 13 | 3775 | 14 | | 354 | | | |
| 14 | 3776 | 15 | 5 | 385 | 3/22 | 9/23 | |
| 15 | 3777 | 16 | | 355 | | | 1 |
| 16 | 3778 | 17 | | 353 | | | 1 & 2 |
| 17 | 3779 | 18 | 6 | 384 | 3/19 | 9/20 | |
| 18 | 3780 | 19 | | 355 | | | |
| 19 | 3781 | 20 | 7 | 383 | | | 1 |

# The Calendric Events of 4-6 AD

The first leap year of this cycle is the year 4 AD. This leap year, civil year 3765, ended 385 days later on Elul 29, Wednesday, September 23, 5 AD. The length of this leap year automatically declares Trumpets for the next day, Thursday, September 24, 5 AD. Remember, we are now utilizing calendric mathematics and astronomy to reconstruct the Hebrew Calendar.

In looking at the astronomy of this date, the astronomical conjunction occurred at 10:19 AM (08:19 UT) Jerusalem time, Tuesday, September 22, 5 AD—two days before Trumpets was declared by calendar mathematics. The molad occurred at 9 hours and 475 parts on Tuesday, September 22, 5 AD. Again, two days before Trumpets was declared by calendar mathematics. As the molad fell on a Tuesday at the $9^{th}$ hour and 475 parts it was postponed to Wednesday by Rule 3** and then to Thursday by Rule 1*. Postponement rules given below are not listed by order of application. Basic astronomy and calendar mathematics confirm the absolute necessity for postponement rules 3 and 1.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

** Rule 3: When the Molad of Tishri of a common year falls on a Tuesday, at or after 9 hours and 204 parts, the declaration of Tishri 1 is advanced to Wednesday. The application of Rule 1 advances the declaration one more day to Thursday.

5 AD, civil year 3766, was 354 days in length. It ended on Elul 29, Sunday, September 12, 6 AD. The Feast of Trumpets was declared for Monday, September 13, 6 AD, civil year 3767. The astronomical conjunction occurred at 12:22 PM (10:22 UT) Jerusalem time, Saturday, September 11, 6 AD. The Molad of Tishri occurred on Saturday, September 11 at 18 hours and 271 parts. Yet Trumpets wasn't declared until Monday, September 13, 6 AD. Rule 2**, the eighteen-hour rule, kicked in, postponing the molad to Sunday, September 12, 6 AD. Rule 1* then kicked in postponing the molad to Monday, September 13, 6 AD. Postponement rules are listed by order of application.

Once again:

> Nisan 1, 5 AD, was declared by calendric calculation of Tishri 1 and the 177 day rule—not by observation or astronomical conjunction.
>
> Tishri 1, 6 AD, was declared by calendric calculation, including the activation of Rules 1 & 2—not by observation or astronomical conjunction.
>
> Atonement, 6 AD, was advance from a Sunday to a Monday observance by the application of postponement Rule 1.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

** Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

## The Calendric Events of 7 AD

Passover 7 AD, civil year 3767, was celebrated Sunday night, March 20 a full 3 days before the spring equinox. Tishri 22 was celebrated on September 22, 7 AD, civil year 3768, a full three days before the fall equinox. Passover 18 AD, civil year 3778, was celebrated Friday night, March 18 a full 5 days before the spring equinox! Tishri 22 was celebrated that fall on Tuesday, September 20, civil year 3779, a full 5 days before the fall equinox!

# The Calendric Events of 15-16 AD

In 15 AD, civil year 3776, was a leap year. It was the 14th year of the 19-year cycle and the 5th leap year in the current intercalary cycle. This leap year was also a year of 385 days. Elul 29, the last day of this leap year, fell on Sunday, September 1, 15 AD, civil year 3776. The Molad of Tishri fell on Monday, September 2 at 15 hours 814 parts. The Feast of Trumpets was declared for Monday, September 2, 15 AD.

Year 15 AD has another claim to fame. Passover day, Nisan 14 fell on Friday, March 22, 15 AD, civil year 3775. The spring equinox fell on Saturday, March 23, 15 AD. Passover was thus celebrated on the evening of Thursday, March 21, 15 AD a full day before the spring equinox. Furthermore, Tishri 22 was celebrated on Monday, September 23, 15 AD, civil year 3776. The fall equinox occurred on Wednesday, September 25. Thus the entire Feast of Tabernacles season was over two full days before the fall equinox.

In 16 AD, civil year 3777 was the 15th year of the 19-year cycle. 16 AD was a year of 355 days. The Molad of Tishri fell on Sunday, September 20 at 13 hours 323 parts. Rule 1* was tripped to declare Trumpets on the next day, Monday. The Feast of Trumpets was declared for Monday, September 21, 16 AD.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

## The Calendric Events of 18 AD

In 18 AD, civil year 3779, Tishri 22 was celebrated on September 20. This means that it was celebrated that fall on a Tuesday, a full 5 days before the fall equinox!

Once again:

> Nisan 1, 15 AD, was declared by calendric calculation of Tishri 1 and the 177-day rule—not by observation or astronomical conjunction.
>
> Tishri 1, 16 AD, was declared by calendric calculation, including the invocation of Rule 1—not by observation or astronomical conjunction.
>
> Atonement, 16 AD, was advance from a Sunday to a Monday observance by the postponement of Trumpets by Rule 1.
>
> The Passover, 15 AD, was celebrated before the spring equinox.
>
> The Feast of Tabernacles and Tishri 22, 16 AD, were celebrated before the fall equinox.
>
> The Feast of Tabernacles and Tishri 22, 18 AD, were celebrated before the fall equinox.

# Chapter Seventeen

## 19-Year Cycle Three
## 21 AD to 39 AD

| Cycle Year | Civil Year | Year AD | Intercalary Year | Year Length | Nisan 14 On/Before Equinox | Tishri 22 On/Before Equinox | Rules Used |
|---|---|---|---|---|---|---|---|
| 1 | 3782 | 21 | | 355 | | | |
| 2 | 3783 | 22 | | 354 | | | 2 |
| 3 | 3784 | 23 | 1 | 385 | | 9/25 | |
| 4 | 3785 | 24 | | 355 | | | 1 |
| 5 | 3786 | 25 | | 354 | | | 1 & 3 |
| 6 | 3787 | 26 | 2 | 385 | 3/21 | 9/23 | 1 & 2 |
| 7 | 3788 | 27 | | 355 | | | 1 |
| 8 | 3789 | 28 | 3 | 383 | | | 1 |
| 9 | 3790 | 29 | | 354 | | | 2 |
| 10 | 3791 | 30 | | 355 | | | |
| 11 | 3792 | 31 | 4 | 385 | | | 1 |
| 12 | 3793 | 32 | | 354 | | | 1 & 3 |
| 13 | 3794 | 33 | | 353 | | | 1 & 2 |
| 14 | 3795 | 34 | 5 | 385 | 3/22 | 9/23 | |
| 15 | 3796 | 35 | | 354 | | | 1 |
| 16 | 3797 | 36 | | 355 | | | 1 |
| 17 | 3798 | 37 | 6 | 383 | 3/20 | 9/21 | 1 &2 |
| 18 | 3799 | 38 | | 354 | | | 2 |
| 19 | 3800 | 39 | 7 | 385 | | | |

# The Calendric Events of 26-27 AD

Monumental things happened during the seven-year period beginning with 26 AD. Jesus began his ministry in the fall of 26 AD and was crucified 3½ years later in the spring of 30 AD. Let's look at the seven-year period from 26 to 32 AD.

The year 26 AD was a leap year of 383 days. It was the 6th year of the 19-year cycle and the 2nd leap year in the intercalary cycle. Elul 29, the 382nd day of this leap year, fell on Sunday, September 1, 26 AD. Trumpets was declared for Monday, September 2, 26 AD. The astronomical conjunction fell on Friday, August 30, 26 AD at 11:06 PM (21:06 UT) Jerusalem time. The Molad of Tishri fell the next day on Saturday, August 31, 26 AD at 1:38 PM (11:38 UT) Jerusalem time.

Because the molad fell after noon, Rule 2 was tripped moving the molad to Sunday, September 1, 26 AD. Because the molad now fell on a Sunday, Rule 1 was tripped and the molad was moved to Monday, September 2, 26 AD. Trumpets was declared on Monday, two full days after the conjunction and one day past the molad. Both Rules 1* and 2** were thus triggered in this year! This is a premium example of calendar research, as so many things come into play. The molad rules are given below in their order of application.

The leap year of 26 AD ended on Elul 29, Friday, September 19, 27 AD. Trumpets for this new civil year was declared for Saturday, September 20,

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

** Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

27 AD. The astronomical conjunction occurred at 12:28 AM (22:28 UT) Jerusalem time, Thursday, September 18, 27 AD. The Molad of Tishri occurred on Friday, September 19, 27 AD at 17 hours and 171 parts. Because the Molad of Tishri fell on a Friday, Rule 1 was triggered moving the molad to Saturday, September 20, 27 AD. What a phenomenal year, a year in which both the Feast of Trumpets that began civil year 3787, 26 AD, and the Feast of Trumpets that began civil year 3788, 27 AD were both postponed by **Rule 1*.** The beginning of Jesus' ministry was framed by postponement Rule 1.

Jesus began His ministry in a year in which postponement Rules 1 and 2 were both activated to declare Trumpets, 26 AD. Rules 1* was also activated to declare Trumpets, 27 AD. Thus the year Jesus began His ministry was bounded by Rule 1* as well as Rule 2**. Furthermore, the Feast of Tabernacles was history by the fall equinox that year as the fall equinox occurred on Wednesday, September 25, 26 AD. The Feast of Tabernacles began Monday, September 16 and ended on Monday, September 23—two full days before the fall equinox. The disciple Luke records in Luke 4:16 that "The spirit of the Lord was upon Him," to proclaim the acceptable year. This year, with its activations of postponement Rules 1* and 2**, was an acceptable calendar year to the Father. No objection is raised by Jesus that this was an unacceptable calendar year in which to begin His ministry.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

** Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

# The Calendric Events of 28-29 AD

The year 28 AD was the 8th year in the 19-year cycle and the 3rd year in the intercalary cycle. It consisted of 383 days which ended on Elul 29, Monday, September 26, 29 AD. The Molad of Tishri occurred on Wednesday, September 8 at 1 hour and 1047 parts. Rule 1** was tripped moving the molad to Thursday, September 9. Trumpets was declared for Thursday, September 9, 28 AD.

The astronomical conjunction occurred at 4:37 PM (14:37 UT) Jerusalem time, Monday, September 26, 29 AD. The Molad of Tishri occurred on Monday, 23 hour and 556 parts. The Feast of Trumpets was declared for the next day, Tuesday, September 27, 29 AD. Because the molad fell after noon at 23 hours, Rule 2** was activated and the molad was postponed to Tuesday, September 27, 29 AD.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

** Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

# The Calendric Events of 31 AD

The year 31 AD, civil year 3792, was the 11th year of the 19-year cycle and the 4th leap year of the intercalary cycle with a total of 385 days. The astronomical conjunction occurred at 5:51 PM (15:51 UT) Jerusalem time, Wednesday, September 5, 31 AD. The Molad of Tishri occured on a Wednesday, September 5, 31 AD at 17 hours and 148 parts, or 11:08 AM (09:98 UT) Jerusalem time. Because the molad fell on a Wednesday, Rule 1* was triggered moving the molad to Thursday. The Feast of Trumpets was declared for Thursday, September 6, 31 AD.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

# The Calendric Events of 32 AD

The year 32 AD, civil year 3793, was the 12th year of the 19-year cycle. The Feast of Trumpets was declared for Thursday, September 25, 32 AD. The astronomical conjunction occurred at 1:47 PM (11:47 UT), Jerusalem time, Tuesday, September 23, 32 AD. The Molad of Tishri occurred at 8:41 AM (06:41 UT) Jerusalem time, Tuesday, September 23, 32 AD. Because the molad fell on Tuesday, September 23, at 14 hours and 737 parts, **Rule 3**** was triggered moving the molad to Wednesday, September 24, 32 AD. This in turn triggered **Rule 1*,** moving the molad to Thursday, September 25, 32 AD.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

** Rule 3: When the Molad of Tishri of a common year falls on a Tuesday, at or after 9 hours and 204 parts, the declaration of Tishri 1 is advanced to Wednesday. The application of Rule 1 advances the declaration one more day to Thursday.

## The Calendric Events of 34 AD

In 34 AD, civil year 3795, the Passover day fell on Monday, March 22, 34 AD, civil year 3794. This means that Passover was celebrated on Sunday night, March 21, 34 AD a full day before the spring equinox. The Feast of Tabernacles began on Thursday, September 16 and ended on Thursday, September 23—two full days before the fall Equinox. The equinox occurred on Saturday, September 25 (10:42:19 UT). 34 AD was the fifth of seven leap years in the cycle.

## The Calendric Events of 37 AD

In 37 AD, civil year 3797, the Passover day fell on Wednesday, March 20, 37 AD. This means that Passover was celebrated on Tuesday night, March 19, 37 AD a full 2 days before the spring equinox. The Feast of Tabernacles began on Saturday, September 14 and ended on Saturday, September 21—three full days before the fall equinox. The fall equinox in 37 AD occurred on Wednesday, September 25 (4:13:40 UT). 37 AD was the sixth of seven leap years in the cycle.

# Chapter Eighteen

## 19-Year Cycle Four
## 40 AD to 58 AD

| Cycle Year | Civil Year | Year AD | Intercalary Year | Year Length | Nisan 14 On/Before Equinox | Tishri 22 On/Before Equinox | Rules Used |
|---|---|---|---|---|---|---|---|
| 1 | 3801 | 40 | | 353 | | | 1 |
| 2 | 3802 | 41 | | 355 | | | |
| 3 | 3803 | 42 | 1 | 384 | | 9/25 | 2 |
| 4 | 3804 | 43 | | 355 | | | 2 |
| 5 | 3805 | 44 | | 353 | | | 1 |
| 6 | 3806 | 45 | 2 | 384 | 3/20 | 9/21 | |
| 7 | 3807 | 46 | | 355 | | | |
| 8 | 3808 | 47 | 3 | 383 | | | 2 |
| 9 | 3809 | 48 | | 355 | | | |
| 10 | 3810 | 49 | | 354 | | | |
| 11 | 3811 | 50 | 4 | 385 | | | |
| 12 | 3812 | 51 | | 355 | | | 1 |
| 13 | 3813 | 52 | | 354 | | | 1 & 3 |
| 14 | 3814 | 53 | 5 | 383 | | 9/24 | 1 |
| 15 | 3815 | 54 | | 355 | | | 2 |
| 16 | 3816 | 55 | | 354 | | | 1 |
| 17 | 3817 | 56 | 6 | 383 | 3/19 | 9/20 | 1 |
| 18 | 3818 | 57 | | 355 | | | |
| 19 | 3819 | 58 | 7 | 385 | | | 2 |

# The Calendric Events of 42 AD

In 42 AD the astronomical conjunction occurred at 8:59 AM (06:59 UT) Jerusalem time, Monday, September 3, 42 AD. The Molad of Tishri occurred on a Monday, September 3, 42 AD at 20 hours and 1075 parts. Because the molad fell after the 18th hour **Rule 2*** was invoked and the molad was postponed to the next day. The Feast of Trumpets 42 AD was thus declared for a Tuesday, September 4.

In 42 AD the Feast of Tabernacles began on Tuesday, September 18 and ended on Tuesday, September 25—the day of the fall equinox. The fall equinox occurred on Tuesday, September 25 at 9:23:34 UT. 42 AD was the first of seven leap years in the cycle.

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*** Rule 2:** When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

## The Calendric Events of 45 AD

In 45 AD the astronomical conjunction occurred at 10:22 PM (20:22 UT) Jerusalem time, Monday, August 30. The Molad of Tishri occurred on a Tuesday at 12 hours and 176 parts, August 31, 45 AD. The Feast of Trumpets was declared for Tuesday, August 31, 45 AD.

In 45 AD the Feast of Tabernacles began on Saturday, September 14 and ended on Saturday, September 21—four full days before the fall equinox. The fall equinox in 45 AD occurred on Wednesday, September 25 (2:59:09 UT). 45 AD was the second of seven leap years in the cycle.

## The Calendric Events of 50 AD

In 50 AD the astronomical conjunction occurred at 4:05 AM (02:05 UT) Jerusalem time, Saturday, September 5. The Molad of Tishri occurred on a Saturday at 9 hours and 743 parts, September 5. The Feast of Trumpets was declared for Saturday, September 5, 50 AD.

## The Calendric Events of 53 AD

In 53 AD the astronomical conjunction occurred at 7:14 AM (05:13 UT) Jerusalem time, Saturday, September 1, 53 AD. The Molad of Tishri occurred on Sunday at 0 hours and 923 parts, September 2, 53 AD. Because the molad fell on a Sunday it was moved to Monday by **Rule 1***. The Feast of Trumpets was declared for Monday, September 3, 53 AD.

In 53 AD the Feast of Tabernacles began on Monday, September 17 and ended on Monday, September 24—one full day before the fall equinox. The fall equinox in 53 AD occurred on Tuesday, September 25 at 1:22:49 UT. 53 AD was the fifth of seven leap years in the cycle. Remember that the apostle Paul was taken back to Jerusalem to observe this feast season under the direct instructions of the risen Christ! Christ therefore placed His stamp of approval on the timing of this festival season.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

## The Calendric Events of 56 AD

In 56 AD the astronomical conjunction occurred at 3:01 PM (13:01 UT) Jerusalem time, Sunday, August 29. The Molad of Tishri occurred on Sunday, August 30 at 16 hours and 24 parts. Trumpets was declared for Monday, August 30, 56 AD by the activation of Rule 1. In 56 AD the Feast of Tabernacles began on Monday, September 13 and ended on Monday, September 20—four full days before the fall equinox. The fall equinox in 56 AD occurred on Saturday, September 24 at 18:47:41 UT. 56 AD was the sixth of seven leap years in the cycle.

# The Calendric Events of 58 AD

In 58 AD the astronomical conjunction occurred at (19:51 UT) Jerusalem time, Wednesday, September 6. The Molad of Tishri occurred on Wednesday, September 6, 58 AD at 22 hours and 410 parts. Because the molad fell after noon on Wednesday Rule 2* was triggered moving the molad to Thursday. The Feast of Trumpets was declared for Thursday, September 7, 58 AD.

There was a postponement because of Rule 2, as the molad fell past noon. If it had occurred before noon, then Rule 1 would have become active.

Trumpets, 58 AD was declared by the Hebrew Calendar to be Thursday, September 7. The molad fell about 4:30 PM, Wednesday, September 6, while the astronomical conjunction occurred later that evening at 7:31 PM, Jerusalem time. Hence, the molad actually fell about 3 hours before the conjunction. Obviously, no crescent was visible. This declaration makes possible the chronology of Acts 20.

It is amazing how perfectly the chronology of 58 AD matches the weekday set-up of the Troas event. This would not happen with an assumed older pattern of intercalation. You will note that Newman's program has the spring of 58 AD intercalated, which is incorrect, thus pushing Passover to Wednesday, April 26 rather than Monday March 27, as it should be. The March declaration of Passover yields a perfect chronology for "sailing away from Philippi (immediately) after the Days of Unleavened Bread." The 5$^{th}$ day was then a weekly Sabbath.

Please notice that Paul's preaching and the Wave Sheaf event on Sunday are chronologically out of order. Bullinger apparently believes this event took place in 57 AD, but this date will not work with the Hebrew Calendar.

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* Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

# Chapter Nineteen

## 19-Year Cycle Five
## 59AD to 77 AD

| Cycle Year | Civil Year | Year AD | Intercalary Year | Year Length | Nisan 14 On/Before Equinox | Tishri 22 On/Before Equinox | Rules Used |
|---|---|---|---|---|---|---|---|
| 1 | 3820 | 59 | | 354 | | | 2 & 3 |
| 2 | 3821 | 60 | | 353 | | | 1 |
| 3 | 3822 | 61 | 1 | 385 | | 9/24 | |
| 4 | 3823 | 62 | | 354 | | | 1 |
| 5 | 3824 | 63 | | 355 | | | 2 |
| 6 | 3825 | 64 | 2 | 383 | 3/21 | 9/22 | 1 |
| 7 | 3826 | 65 | | 354 | | | |
| 8 | 3827 | 66 | 3 | 385 | | | |
| 9 | 3828 | 67 | | 353 | | | 1 |
| 10 | 3829 | 68 | | 355 | | | |
| 11 | 3830 | 69 | 4 | 384 | | | |
| 12 | 3831 | 70 | | 355 | | | 2 |
| 13 | 3832 | 71 | | 353 | | | 1 |
| 14 | 3833 | 72 | 5 | 384 | 3/21 | 9/22 | |
| 15 | 3834 | 73 | | 355 | | | |
| 16 | 3835 | 74 | | 355 | | | 2 |
| 17 | 3836 | 75 | 6 | 383 | 3/20 | 9/21 | 1 |
| 18 | 3837 | 76 | | 354 | | | |
| 19 | 3838 | 77 | 7 | 385 | | | |

## The Calendric Events of 61 AD

In 61 AD the astronomical conjunction occurred at 7:19 PM (17:19 UT) Jerusalem time, Wednesday, September 2. The Molad of Tishri occurred on Thursday, September 3 at 13 hours and 591 parts. The Feast of Trumpets was declared for Thursday, September 3, 61 AD.

In 61 AD the Feast of Tabernacles began on Thursday, September 17 and ended on Thursday, September 24—one full day before the fall equinox. The fall equinox in 61 AD occurred on Friday, September 25 at 0:04:29 UT. **The year 61 AD** was the first of seven leap years in the cycle.

## The Calendric Events of 64 AD

In 64 AD the astronomical conjunction occurred at (20:56 UT) Jerusalem time, Thursday, August 30. The Molad of Tishri occurred on Friday, August 31 at 4 hours and 772 parts, 64 AD. Because the molad occurred on a Friday, Rule 1* kicked in moving the molad to Saturday, September 1, 64 AD.

In 64 AD the Feast of Tabernacles began on Saturday, September 15 and ended on Saturday, September 22—two full days before the fall equinox. The fall equinox in 64 AD occurred on Monday, September 24 at 17:17:34 UT. The year 64 AD was the second of seven leap years in the cycle.

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* Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

## The Calendric Events of 66 AD

In 66 AD the astronomical conjunction occurred at (10:15 UT) Jerusalem time, Monday, September 8. The Molad of Tishri occurred on Monday, September 8 at 11 hours and 77 parts. The Feast of Trumpets was declared for Monday, September 8, 66 AD.

## The Calendric Events of 69 AD

In 69 AD the astronomical conjunction occurred at 11:21 AM (09:21 UT) Jerusalem time, Monday, September 4. The Molad of Tishri occurred on Tuesday, September 5 at 2 hours and 258 parts. The Feast of Trumpets was declared for Tuesday, September 5, 69 AD.

## The Calendric Events of 70 AD

In 70 AD the astronomical conjunction occurred at 6:37 AM (04:37 UT) Jerusalem time, Sunday, September 23. The Molad of Tishri occurred on Sunday, September 23, 70 AD at 5:47 PM. Because the molad fell past the 18th hour on Sunday at 23 hours and 847 parts, **Rule 2*** kicked in moving the molad to Monday. The Feast of Trumpets was declared for Monday, September 24, 70 AD.

The astronomical conjunction of Tishri, 70 AD occurred at 6:37 AM (04:37 UT), Sunday, September 23, Jerusalem time. So, as we can see, the molad calculation was about 12 hours later, and the Hebrew Calendar declared Monday as Trumpets.

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* Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

## The Calendric Events of 72 AD

In 72 AD the astronomical conjunction occurred at 5:53 AM (03:53 UT) Jerusalem time, Tuesday, September 1. The Molad of Tishri occurred on Tuesday, September 1 at 17 hours and 439 parts. The Feast of Trumpets was declared for Tuesday, September 1, 72 AD. The Feast of Tabernacles began on Thursday, September 15 and ended on Thursday, September 22—two full days before the fall equinox. The fall equinox in 72 AD occurred on Thursday, September 24 at 15:59:31 UT. The year 72 AD was the fifth of seven leap years in the cycle.

## The Calendric Events of 75 AD

In 75 AD the Feast of Tabernacles began on Thursday, September 14 and ended on Thursday, September 21—four full days before the fall equinox. The fall equinox in 75 AD occurred on Monday, September 25 at 9:26:44 UT. The year 75 AD was the sixth of seven leap years in the cycle.

## The Calendric Events of 77 AD

In 77 AD the astronomical conjunction occurred at (04:11 UT) Jerusalem time, Saturday, September 6. The Molad of Tishri occurred on Saturday, September 6 at 14 hours and 1005 parts. The Feast of Trumpets was declared for Saturday, September 6, 77 AD.

# Conclusion

We can conclude with absolute assurance that the calendar of Christ and the apostles was a fixed, calculated calendar—the very same Hebrew Calendar we use today:

*that it also used the same length of months in the same month patterns used today.

*that the length and progression of years utilized by the Hebrew Calendar of today are the same.

*that it used the same intercalary sequence of 3, 6, 8, 11, 14, 17 and 19 that is used today.

*that it was postponed by the same rules of postponement that the Hebrew Calendar utilizes today.

*that the holy days were declared by calculation not observation, conjunction, the barley crop or star charts.

*that Trumpets never fell on a Wednesday, Friday or Sunday.

*that Passover commonly occurred before the spring equinox.

*and, that the entire Feast of Tabernacles season was commonly over before the fall equinox, meaning the calendar of Christ and the apostles was never directly linked to the fall equinox.

When we add the days-per-year of the Hebrew Calendar from 5 BC to 70 AD we learn that they match the number of solar days to the very day! This match was only made possible by the activation and application of postponement rules as calendar mathematics called for. Here then we have solid evidence and confirmation that postponements were an intrinsic part of

the calendar of Christ and the apostles, for without their activation, the number of lunar days between Trumpets 5 BC and Trumpets 70 AD would not even come close to matching the number of solar days for the same period as well as matching the facts of Scripture, history, astronomy mathematics.

The Hebrew Calendar is not broken! There is no need to “fix” it!

# *Appendix A*

## The Rules of Postponement

Postponements are part of the process of calculating the new moon of Tishri. After calculating the molad, the following requirements must be met before the declaration is made.

Rule 1: When the Molad of Tishri or advancement occurs on a Sunday, Wednesday, or Friday, the declaration of Tishri 1 is advanced one day to a Monday, Thursday or Saturday (Sabbath) respectively.

Rule 2: When the Molad of Tishri occurs at noon (18 hours 0 parts) or later, the declaration of Tishri 1 is advanced to the next day.

Rule 3: When the Molad of Tishri of a common year falls on a Tuesday, at or after 9 hours and 204 parts, the declaration of Tishri 1 is advanced to Wednesday. The application of Rule 1 advances the declaration one more day to Thursday.

Rule 4: When the Molad of Tishri of a common year immediately following an intercalary year occurs on a Monday, at or after 15 hours and 589 parts, the declaration of Tishri 1 is advanced to Tuesday.

# *Glossary of Terms*

## Note: All astronomical definitions are taken from Norton's 2000.0 Star Atlas and Reference Handbook.

**astronomical conjunction** the point in time during the dark phase of the moon, when the earth, moon and sun line up on the same axis. The astronomical conjunction is not the Molad.

**astronomical new moon** the moon's phase at total darkness. It is not the new moon of Scripture. See also **dark of the moon**.

**autumnal equinox** the point where the sun crosses the celestial equator moving southward, about September 23 each year

**common year** any one of three types of years in the Hebrew Calendar; a deficient common year contains 353 days, a regular common year contains 354 days and a perfect common year contains 355 days. See also **leap year**.

**conjunction** See **astronomical conjunction**.

**dark of the moon** the totally dark phase of the moon. It is not the new moon of Scripture. Referred to by astronomers as the "new moon."

**equinox** the time when the sun crosses the equator, making the length of day and night equal.

**fall equinox** See **autumnal equinox**.

**Greenwich Mean Time (GMT)** the mean solar time at the longitude of Greenwich, counting from midnight. See also **Universal Time (UT)**.

**Jerusalem time (JT)** the mean solar time at the longitude of Jerusalem, counting from midnight. Expressed in hours and minutes; (i.e., 7:45 PM). Expressed in Hebrew Calendar time (19:35, that is, 12:00 plus 7:35 hours equals 19:35).

**Julian Date (JD)** a system of dates used by astronomers that counts the number of days that have elapsed since a given starting date; Julian dates are reckoned from Greenwich noon and are given in decimal form. (For example, 2000 January 1 at Greenwich noon is JD 2451545.0.) Not the same as Julian Calendar.

**intercalary year** a year with a thirteenth month, specifically, years 3, 6, 8, 11, 14, 17, 19 of each 19-year cycle. See also **leap year**.

**latitude** the angular distance, measured in degrees, north or south of the equator
**leap year** any of three types of years in the Hebrew Calendar; a deficient leap year contains 383 days, a regular leap year contains 384 days and a perfect leap year contains 385 days. See also **common year**.

**longitude** the angular distance, measured in degrees, east or west of the prime meridian of Greenwich.

**lunation** the time taken by a complete cycle of phases of the moon, such as from one full moon to the next. A lunation lasts 29.53 days; it is the same as a synodic month.

**new moon** in Scripture, the visible crescent as seen from Jerusalem. Not the same as the astronomical new moon, which is not visible.

**Metonic cycle** the period of 19 calendar years (6939.6 days) after which the moon's phases recur on the same day of the year. Known by ancient astronomers around the world long before the Greek Meton. There are 235 lunations in a Metonic cycle.

Molad the mean or average conjunction of the earth, moon and sun; its mean or average length is 29.53059 days. The Molad is not the same as the astronomical conjunction. See also **synodic month**.

**part** a measurement of time in the Hebrew Calendar equating to $3^{1/3}$ seconds. There are 18 parts to a minute and 1040 parts to an hour.

**postponement** a one or two day adjustment to the calculation of the Molad of Tishri. The Rules of Postponement enable the process of calculating the declaration of the new moon of Tishri to achieve the greatest degree of accuracy in relationship to the lunar cycle.

**spring equinox** See **vernal equinox**.

**synodic month** the interval between successive new moons. It is also known as a lunation. Its mean or average length is 29.53059 days, but the actual value can vary between 29¼ and 29¾ days.

**time zones** the 24 divisions of the earth, each 15 degrees broad, with the prime zone centered on the Greenwich meridian. Time in the zones to the east of Greenwich is ahead of GMT, while zones to the west of Greenwich are behind GMT. Jerusalem is east of Greenwich and ahead of Greenwich time by two hours.

**Universal Time (UT)** the name given to Greenwich Mean Time (GMT) in 1928 for scientific purposes.

**vernal equinox** the point where the sun crosses the celestial equator moving northward, about March 21 each year.