

- [1] Biblical Key to the Calendar is Gen 1:14-18
- [2] Uses of Appointed-times [4150 *moed*]
- [3] Stars in Genesis 1:16
- [4] The Sun, Stars, and Years
- [5] The Zodiac Defined
- [6] Reasons that the Zodiac is not what the Stars mean in Gen 1:16
- [7] When does the Sign of Aries begin each Year?
- [8] Hellenism and the use of the signs of the Zodiac among Jews
- [9] The Sun is involved for Biblical Years
- [10] Light Triggers and the Vernal Equinox
- [11] Starting with the Nearest New Crescent to the Vernal Equinox has problems
- [12] What is the Biblical Vernal Equinox?
- [13] Adoption of the Babylonian Month Names in Jerusalem
- [14] The Passover Letter shows the Jerusalem Nisan was the Babylonian Nisanu
- [15] Philo explains when the First Month of the Biblical Year begins
- [16] Summary of Evidence that favors Specific use of the Vernal Equinox
- [17] Astronomy and *tkufah*: its Meaning as Season and Ex 34:22
- [18] Introduction to Anatolius and the Easter Rule
- [19] Authority in Israel Distorted by Josephus
- [20] Josephus and his Aries Approximation
- [21] Destruction of the Temple and Nisan 1 moves into the Winter
- [22] Cessation of the Babylonian Calendar shortly after 75
- [23] Hippolytus Promotes Abandoning the Jewish Calendar c. 222
- [24] Origen and the Jewish Calendar
- [25] Eusebius Reports on Anatolius who wrote c. 277
- [26] Scholars Judge the Credibility of Anatolius
- [27] Summary Concerning Anatolius
- [28] W. Robertson Smith's Commentary on Barley in Exodus 9:31-32
- [29] Historical Aspects of Barley and the First Month
  - (A) The Tosefta c. 250 CE
  - (B) The Early Church and the First Month
  - (C) History of the Viewpoint that Barley alone points to the First Month
- [30] Abandonment of the word *aviv* to indicate the First Month
- [31] The Problem of a Biblical Test to Perform on the Barley
- [32] The Time and Geographical Context of Exodus 12:1-2
- [33] Septuagint's Translation of *aviv*
- [34] The Meaning of Sheaf [*omer*] in the Wave Sheaf Offering
- [35] Wave Sheaf Offering and the Harvest / Crop (Hebrew *ketseer*)

- [36] The Lack of firstfruits [*bikurim*] in the Wave Sheaf Offering
- [37] Month of the Sheaf?
- [38] Is there a command to search for *aviv*?
- [39] Meaning of Lev 2:14-16 which contains *aviv*
- [40] Smith's Commentary on Exodus 9:31-32
- [41] Bibliography

[1] Biblical Key to the Calendar is Gen 1:14-18

The overall goal of this study is to shed light on the biblical calendar. More specifically it is to focus on how the new year begins, which translates into which new moon is the first new moon of the year.

Gen 1:14, “And the Almighty said: Let there be lights in the expanse of the heavens to separate between the daytime and the night, and let them be for signs, and for appointed-times [4150 *moed* (the Hebrew has the plural)], and for days and years.”

Gen 1:15, “And let them be for lights in the expanse of the heavens to give light on the earth, and it was so.”

Gen 1:16, “And the Almighty made the two great lights, the greater light to rule the daytime and the lesser light to rule the night, and [He made] the stars.”

Gen 1:17, “And the Almighty set them in the expanse of the heavens to give light upon the earth”

Gen 1:18, “and to rule by daytime and by night, and to separate between the light and the darkness.”

In verse 14 the word *moed* appears, and all 222 occurrences of this word are shown separated into nine categories below. From these categories we note that the only ones that make sense in the context of periodically occurring events based on the heavenly lights are the annual festival(s), the seventh day Sabbath, the Day of Atonements, and bird migrations. Since the latter only occurs once and the former occurs 40 times, it only seems sensible to understand the appointed-times in Gen 1:14 to refer to the annual festivals, the Sabbath, and the Day of Atonements. Lev 23 is the festival chapter and *moed* occurs six times in that chapter.

**Since the annual festivals are determined by the calendar, Gen 1:14-18 makes the calendar dependent on the lights in the heavens.**

In verse 15 the word “them” refers back to the subject in verse 14, namely the lights. Thus verse 15 is saying in essence, “let the lights be for lights... **to give light** on the earth”. Even the names of the heavenly bodies are absent to put emphasis on the “light bringing” purpose and mission of these heavenly light bodies to fulfill the need to determine “signs, appointed-times, days, and years”. The triply emphasized mission of light from the heavenly bodies (in verses 14-15) **to give light** to determine appointed-times and years must be given its appropriate place in thought and use. **Specifically verse 15 states “to give light”, and thus it is the giving of light by the lights that is the key principle for the calendar.**

[2] Uses of Appointed-times [4150 *moed*]

9 Usages, 222 Occurrences

Appointed Meeting (Tent of Meeting) - 146 Occurrences

Ex 27:21 Ex 28:43 Ex 29:4 Ex 29:10 Ex 29:11  
Ex 29:30 Ex 29:32 Ex 29:42 Ex 29:44 Ex 30:16  
Ex 30:18 Ex 30:20 Ex 30:26 Ex 30:36 Ex 31:7  
Ex 33:7 Ex 33:7 Ex 35:21 Ex 38:8 Ex 38:30  
Ex 39:32 Ex 39:40 Ex 40:2 Ex 40:6 Ex 40:7  
Ex 40:12 Ex 40:22 Ex 40:24 Ex 40:26 Ex 40:29  
Ex 40:30 Ex 40:32 Ex 40:34 Ex 40:35 Lev 1:1  
Lev 1:3 Lev 1:5 Lev 3:2 Lev 3:8 Lev 3:13  
Lev 4:4 Lev 4:5 Lev 4:7 Lev 4:7 Lev 4:14  
Lev 4:16 Lev 4:18 Lev 4:18 Lev 6:16 Lev 6:26  
Lev 6:30 Lev 8:3 Lev 8:4 Lev 8:31 Lev 8:33  
Lev 8:35 Lev 9:5 Lev 9:23 Lev 10:7 Lev 10:9  
Lev 12:6 Lev 14:11 Lev 14:23 Lev 15:14 Lev 15:29  
Lev 16:7 Lev 16:16 Lev 16:17 Lev 16:20 Lev 16:23  
Lev 16:33 Lev 17:4 Lev 17:5 Lev 17:6 Lev 17:9  
Lev 19:21 Lev 24:3 Num 1:1 Num 2:2 Num 2:17  
Num 3:7 Num 3:8 Num 3:25 Num 3:25 Num 3:38  
Num 4:3 Num 4:4 Num 4:15 Num 4:23 Num 4:25  
Num 4:25 Num 4:28 Num 4:30 Num 4:31 Num 4:33  
Num 4:35 Num 4:37 Num 4:39 Num 4:41 Num 4:43  
Num 4:47 Num 6:10 Num 6:13 Num 6:18 Num 7:5  
Num 7:89 Num 8:9 Num 8:15 Num 8:19 Num 8:22  
Num 8:24 Num 8:26 Num 10:3 Num 11:16 Num 12:4  
Num 14:10 Num 16:18 Num 16:19 Num 16:42 Num 16:43  
Num 16:50 Num 17:4 Num 18:4 Num 18:6 Num 18:21  
Num 18:22 Num 18:23 Num 18:31 Num 19:4 Num 20:6  
Num 25:6 Num 27:2 Num 31:54 Deut 31:14 Deut 31:14  
Josh 18:1 Josh 19:51 I Sam 2:22 I Ki 8:4 I Chr 6:32  
I Chr 9:21 I Chr 23:32 II Chr 1:3 II Chr 1:6 II Chr 1:13

II Chr 5:5

Periodic Dated Festival / Festivals / Sabbath - 40 Occurrences

(In the context of Lev 23:2, 4 mentioned below, the seventh day Sabbath is included with the festivals in the use of *moed*. Hence, as a periodic time, the Sabbath is included with the festivals under the use of *moed*. This indicates that the Sabbath is also a festival, but there is no biblical evidence that an annual festival is also a Sabbath (= specific Hebrew word *shabat*), except for the Day of Atonement – see Lev 16:31; 23:32.

Gen 1:14    Ex 13:10    Ex 23:15    Ex 34:18    Lev 23:2  
Lev 23:2    Lev 23:4    Lev 23:4    Lev 23:37    Lev 23:44  
Num 9:2    Num 9:3    Num 9:7    Num 9:13    Num 10:10  
Num 15:3    Num 29:39    Deut 16:6    Deut 31:10    I Chr 23:31  
II Chr 2:4    II Chr 30:22    II Chr 31:3    Ezr 3:5    Neh 10:33  
Ps 104:19    Isa 1:14    Isa 33:20    Lam 1:4    Lam 2:6B  
Lam 2:7    Lam 2:22    Ezek 36:38    Ezek 44:24    Ezek 45:17  
Ezek 46:9    Ezek 46:11    Hos 2:11    Hos 9:5    Hos 12:9

Appointed Time - 22 Occurrences

Gen 17:21    Gen 18:14    Gen 21:2    Ex 9:5    Num 28:2  
I Sam 9:24    I Sam 13:8    I Sam 13:11    I Sam 20:35    II Sam 20:5  
II Sam 24:15    II Ki 4:16    II KI 4:17    Ps 75:2    Ps 102:13  
Jer 46:17    Dan 8:19    Dan 11:27    Dan 11:29    Dan 11:35  
Hab 2:3    Zech 8:19

Appointed Place - 7 Occurrences

Josh 8:14    Job 30:23    Ps 74:4    Ps 74:8    Isa 14:13  
Lam 2:6A    Zeph 3:18

Appointed People - 2 Occurrences    Num 16:2; Lam 1:15

Appointed Prophetic Time Interval - 2 Occurrences    Dan 12:7; 12:7

Appointed Sign - 1 Occurrence    Judg 20:38

Bird Migration - 1 Occurrence    Jer 8:7

General Season - 1 Occurrence    Hos 2:9

[3] Stars in Genesis 1:16

Gen 1:14-18 mentions the word “stars” at the end of Gen 1:16. We now seek to

understand the role of the stars. This is important to arrive at an understanding of the role of the sun as well as to understand both Philo of Alexandria and Josephus. The use of the word *stars* in Gen 1:16 may be seen through comments elsewhere in Scripture.

Ps 136:7, “To Him who made the great lights [216 *ohr*] ...”

Ps 136:8, “The sun to rule in [the] daytime ...”

Ps 136:9, “The moon and the stars to rule in [the] night ...”

Jer 31:35, “Thus says YHWH who gives [the] sun for a light by day [and the] fixed-order of [the] moon and stars for a light [by] night, who moves [the] sea so that its waves roar. YHWH of hosts [is] His name.”

From the above we can see that Ps 136:9 and Jer 31:35 mention that the stars help to define the daily time period known as *night*. The stars rule the night according to Ps 136:9. This ruling authority by the stars in the night is understood to be known through the **visibility** of the stars from observers on the earth. **The concept of visibility is neither a prediction nor a calculation.**

The question that is now to be considered is whether the stars have a role in the biblical calendar other than its use in ruling the night through its visibility during the night.

#### [4] The Sun, Stars, and Years

The last word in Gen 1:14 is years. According to Ex 34:22 the Feast of Weeks occurs when the firstfruits of the wheat harvest should be available for offering. This pertains to the approximately stable agricultural year, which has a long-term average equal to the “tropical year” commonly called *the year* in modern society. **Hence the biblical year must have a long-term average length that is equal to the modern year of about 365.2422 days.** This cycle is based upon the earth's orbit around the sun, but are the stars excluded from consideration?

Now consider the possibility that the visible stars (or visible constellations) may determine the beginning of the biblical year. Each year there is a time of first visibility of each constellation. In modern astronomy books concerning the solar system there is almost always a discussion of the concept called the “precession of the equinoxes” which is caused by the gravitational pull of the moon upon the center of mass of the earth, and the earth is pear-shaped rather than an exact sphere. **This lack of symmetry causes the axis of the earth to make one complete cone-shaped cycle each 25,800 years, called precession of the equinoxes.** According to our present knowledge of the history of astronomy, precession was first discovered by the ancient Greek astronomer Hipparchus (c. 190- c. 120 BCE) toward the creative ending of his life perhaps c. 140 BCE. The stars gradually shift in their annual time of visibility based upon this 25,800 year cycle. Hence every 1000 years the stars shift about 14.157 days further away from the vernal equinox. This means that from the time of Moses (about 1450 BCE) until

today there would be a shift of when the stars are seen of about 49 days in the yearly cycle. This shift would destroy the required long-term harmony between the agricultural year and the biblical year. Therefore the visible stars cannot be used to determine the start of the biblical year.

How long would it take for precession of the equinoxes to shift the sighting of the constellations by only one day? This is  $25,800 / 365.2422 = 70.6$  years. This is too slow for a person to notice from year to year. Generally speaking, a person would not suspect that precession is a reality so a person would not even want to start keeping records to see if there was a shift at some time in the future.

#### [5] The Zodiac Defined

Ancient peoples noticed that some clusters of visible stars formed a recognizable pattern, and they gave names to these patterns which are called constellations. In the biblical Hebrew language the word *mazalot* (Strong's number 4208, only found in II Ki 23:5) and *mazarot* (Strong's number 4216, only found in Job 38:32) are typically translated “constellations”. Some authors of biblical Hebrew lexicons that discuss these two words give the meaning “constellations”, but also add “perhaps signs of the zodiac”. Note this “perhaps” on p. 561 in BDB. We now devote space for discussion of the latter suggestion and define the word zodiac. An additional reason to discuss the zodiac is that it is mentioned by both Philo of Alexandria and Josephus.

Many aspects of history have become available in more recent times because a knowledge of ancient languages has increased. In particular, the common language spoken in ancient Assyria and then later in ancient Babylon before c. 700 BCE was the Akkadian language. Gradually the Aramaic language replaced Akkadian in Babylon, yet the ancient Babylonian scholars who were involved in Babylonian astronomy and astrology continued to use the Akkadian language so that their secret methods would not be discovered by others. Tens of thousands of clay tablets written in the Akkadian cuneiform script remained untranslated until after c. 1840 to c. 1870 during which several European scholars gradually deciphered this difficult language with about 500 symbols. The Babylonian astronomical writings in Akkadian were primarily first deciphered in the years leading up to 1900. Before those years there was much incorrect speculation about some aspects of the history of the zodiac. BDB is an example of the speculation.

On page 31 of the book by Koch-Westenholz 1995 the term *zodiac* is defined. Her definition uses the word *ecliptic*, which is the apparent path of the sun in the sky during a complete tropical year as observed from the earth. Constellations appear in the sky at or close to the ecliptic. Her definition of the *zodiac* is: “The ecliptic is divided into twelve equal parts, [called] the signs of the zodiac. The zodiacal *signs* are a mathematical construction and do no longer correspond to the portion of the sky

occupied by the zodiacal *constellations* whose name they bear. The zodiacal signs are: Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius, and Pisces.”

In the above quote, the reason that they “**do no longer correspond to the portion of the sky**” is precession of the equinoxes. The visible constellations have shifted away from the time that the zodiac was originally defined. Since the zodiac is a mathematical construct whose boundaries are artificial rather than visible and the originally seen constellations did not occupy the full one-twelfth of the year that is their whole sign, the zodiac is theoretical rather than visibly seen. However, at the time of the origin of the zodiac, the zodiac was partially visible from the visible constellations.

[6] Reasons that the Zodiac is not what the Stars mean in Gen 1:16

**Since Gen 1:14-18 as translated and discussed above is shown to base the use of *moed* (festivals and thus the calendar) from visible lights in the heavens in contrast to the zodiac as a theoretical construct rather than a visible construct, the zodiac cannot be what was originally intended by the word “stars” in Gen 1:16.**

**It will soon be shown that the time of the origin of the definition of the zodiac is roughly 1000 years after the time Moses, so that is a second reason that the word “stars” in Gen 1:16 cannot be a reference to the zodiac. In fact this will also show that the suggestion in BDB that *mazalot* and *mazarot* might be a reference to the zodiac is incorrect.**

These 12 signs are used in horoscopes which are part of astrology, which attempts to predict the future of a person based upon the sign under which that person was born.

Concerning the origin of the zodiac, which refers to the division of the year into 12 equal parts, each originally containing one designated constellation, but no longer tied to the current location of that constellation, here is a comment by John Britton, a specialist in ancient mathematical astronomy, especially Babylonian astronomy. On p. 244 Britton 1999 wrote, “Obviously the [Babylonian System A] theory [of lunar anomaly] was invented earlier, but it [this mathematical theory of astronomy] seems unlikely to have materially predated the zodiac, which seems to have appeared between -463 and -453. On balance, if we assign its [this theory of lunar anomaly's] invention to -440 +/- 15 years, we should not be too far off.”

Here Britton estimates the origin of the zodiac as 12 equally divided signs of the year between 464 and 454 BCE. On page x of Rochberg 1998, we note the following concerning the origin of horoscopes: “The appearance of horoscopes in Babylonia at the end of the fifth century B.C. [= c. 400 BCE] marks the point when the situation of the heavens at the time of a [person's] birth came to be regarded as significant for the future of an individual.” On pages 20 and 25 Rochberg gives the year 410 BCE as the earliest

known text of a horoscope. Horoscopes are based on the zodiac. Thus we may roughly say that the zodiac was invented by the Babylonians c. 460 BCE. The origin of both the zodiac and horoscopes is ancient Babylon as will be further referenced next.

An important and frequently referenced paper on the history of the zodiac is that of van der Waerden 1952-1953. On p. 217 he wrote, “Babylonian observational astronomy had nothing to learn from the Greeks: it was far ahead of them. The Babylonians had observed and recorded planetary positions for centuries, the Greeks had not.” Later on the same page he continued, “The conclusive proof of the Babylonian origin of the 12 signs can be given by penetrating into the motives, why they were introduced and considered as important.” P. 218 explains the primary motives. The Babylonians (and Greeks) used lunar months in their calendar, but these calendric lunar months shifted widely from year to year with respect to the stars, so that it was very inconvenient to record star positions and also to both record and predict planetary positions using terminology of calendric lunar months.

This recording problem was solved by inventing a *schematic year*, which is an artificial (non-observable) year. This schematic year was divided into 12 equal parts with a name attached to each part, called a sign. **To avoid confusion with calendric month names, these sign names had to be different despite the fact that there was some close time association of a few weeks difference between calendric lunar months and the sign names of this schematic year that later became called the zodiac.**

For each day of the zodiacal schematic year it was possible to select which visible constellations would appear each two hours of the night. Hence by examining the visible constellations during the night, it was possible to determine the approximate time of the night. This was very useful for those Babylonian astronomers who observed the heavenly bodies during the night and looked for planetary positions, lunar positions, and star positions. It enabled them to easily record the approximate time of events without going to the extra trouble of using water clocks which they could and did use for the time of some lunar eclipses and some other events that they deemed important.

**According to van der Waerden in this journal article (p.218), the ability to easily determine the approximate time of the night by examining the visible constellations was the more important reason to create this zodiacal schematic year.** In other words, the zodiac promoted their ability to increase their knowledge of mathematical astronomy. The Babylonian astronomers were diligent to examine the sky every night that weather permitted.

Soon the Babylonian astrologers also used the zodiac to earn income by means of developing horoscopes for wealthy people who were willing to pay for this supposed knowledge about themselves. People believed that if the astronomer-astrologers could predict eclipses, then they could also predict their personal future.

On p.225 van der Waerden wrote, “The Greek zodiac with its 12 signs was not, like the Babylonian zodiac, the result of a gradual development, starting with long and careful observations of planets and zodiacal constellations, but it apparently was introduced all at once by Cleostratus, after Anaximander had discovered its obliquity.” Later on p. 225 we quote, “Hence the conclusion is unavoidable that *the whole Greek zodiac with its 12 signs is of Babylonian origin.*”

On p. 227 we note that the Greek astronomers (in chronological order) Hypsicles, Hipparchus, Geminus, Ptolemy, and Theon began the sign of Aries with the vernal equinox.

At the top of p. 229 van der Waerden wrote, “The only thing that remains really and genuinely Egyptian, is the doctrine of the 36 'Decans' or Calendar Stars, which were supposed to rise and set at intervals of 10 days throughout the year, and to culminate at intervals of 1 hour throughout the night.” Later, on the same page after some further discussion, he wrote, “Obviously the Egyptians had no better method of determining time during the night than the rising, culmination and setting of decans. This means: they knew nothing about the zodiac [at that time before Alexander the Great].” In the next paragraph he wrote, “This conclusion is confirmed by the total absence of texts concerning the zodiac or related topics, before Hellenistic times [beginning c. 330 BCE]. Serious [= mathematically trained] Greek authors (Geminus, Hypsicles, Ptolemy) often use Babylonian methods and observations, but never Egyptian ones.”

In an email sent by professor Lester Ness to the internet group HASTRO-L (history of astronomy discussion group) on June 17, 2004 he translated from the French on p. 53 of the book by Auguste Bouche-Leclercq 1899 as follows, “However, it has been proven beyond doubt that the Egyptian zodiacs are all from the Roman period and freely imitate the Greek zodiac. At one blow, all the extravagant suppositions based upon their [the Egyptian’s] supposed antiquity are destroyed.” This was written to combat the erroneous claims that the zodiac originated in ancient Egypt before the Babylonians.

**Since the zodiac was invented by the Babylonians c. 460 BCE, which is about 1000 years after Moses, the stars in Gen 1:16 cannot refer to the signs of the zodiac.**

The constellation of Orion (Hebrew *keseel*, Strong's number 3685) is mentioned in the singular in Job 9:9; 38:31; Amos 5:8. This word is also mentioned in the plural in Isa 13:10. On page 493 of BDB it states, concerning its use in Isa 13:10 “Orion and other constellations of the same brilliancy”. This constellation covered nearly two-thirds of the sign of Gemini in the zodiac, but that sign is not named after Orion. Hence the Tanak's usage of constellations does step outside of the names of the signs of the zodiac.

**The constellations named in Scripture are not signs of the zodiac, but visible constellations because of the Babylonian origin of the zodiac c. 460 BCE.** Due to precession of the equinoxes, the constellations (stars) cannot be part of the biblical

calendar because the long-term average biblical year must approximate the tropical year of 365.2422 days as explained above. There is no Scripture that has an association between a constellation and a biblical festival.

[7] When does the Sign of Aries begin each Year?

Aries is the Latin word that means “ram”. Aries is the name of the first of the 12 signs of the zodiac. However, it did not become the name of the first sign until after the Greeks adopted the zodiac from the Babylonians. The Babylonians named the first sign of the zodiac “Hired Man” (hireling). The word “zodiac” is a Greek word that means circle of animals.

The zodiac is divided up into 360 equal parts, each of which is called a degree. This shows that each degree is slightly longer than one day because there are about 365.2422 days per year. Each of the 12 signs is 30 degrees, so that each sign averages almost 30.5 days.

The constellation of Aries is not the sign of Aries. The constellation shifts, but the sign does not shift. When writers are discussing time and they mention the name of a sign of the zodiac, they are never referring to the visible constellation.

When does the sign of Aries begin each year? The answer is not as simple as one may think, because it depends upon the time in history, the location, and sometimes the person who is writing!!

The Roman author named Columella wrote a series of 12 books titled *On Agriculture* in Latin c. 50 CE, which is about the time that Philo of Alexandria died and Josephus was 13 years old. On page 481 of Columella in 9:14:1, he wrote, “From the first equinox, which takes place about the twenty-fourth of March in the eighth degree of the Ram ...” He was using the Julian calendar, and in the first century the vernal equinox in the Julian calendar fell on March 22 or 23, so he was close in writing March 24. He wrote that the vernal equinox occurred in the 8th degree of the sign of Aries. This means that the first day of Aries was seven days before the vernal equinox for Columella. If we take the vernal equinox to be Julian March 23 in the first century, then the first day of Aries is on March 16.

On pages 487, 489 of Columella in 9:14:12, he wrote, “I am well acquainted with the reckoning of Hipparchus, which declares that the solstices and equinoxes occur not in the eighth but in the first degrees of the signs of the Zodiac; however, in these rural instructions I am now following the calendar of Eudoxus and Meton and the old astronomers, which are adapted to the public festivals, because this view, accepted in old times, is more familiar to farmers and, on the other hand, the authority of Hipparchus is not necessary for rustics of less refined education.”

The Roman author Columella informs us here that the Greek astronomer Hipparchus

began the sign of Aries on the vernal equinox, but he is beginning it seven days earlier.

The Roman architect Vitruvius wrote a series of 10 books titled *On Architecture* after 27 BCE. On page 233 of Vitruvius (translated by Granger) in 9:100:3, he wrote, “When he [the sun] enters the sign of the Ram and traverses the eighth degree, he makes the vernal equinox.” Vitruvius is in perfect agreement with Columella.

The Roman writer Pliny the Elder (23-79) wrote his encyclopedia *Natural History* c. 50-77 in Latin. This encompassed a vast array of ancient knowledge in 37 books, and it was highly esteemed for hundreds of years after his death. Vespasian, the Emperor of the Roman Empire, granted him a tract of land in Rome for his later years, just as Vespasian granted to Josephus in 70. During Pliny’s last nine years of life, from 70 to 79, it is likely that Pliny and Josephus met since they had the same patron and lived in the same environs. However, Pliny was a traveler by nature, so they may not have met frequently. The nobility in Rome for which Josephus wrote would have been familiar with Pliny's works, so Josephus would have used Pliny's terminology knowing it was familiar to the nobles. On page 225 of Pliny\_1 in 2:16:81, he wrote, “The sun itself has four differences, as there are two equinoxes, in spring and autumn, when it coincides with the center of the earth at the eighth degree of Aries and Libra ...” On page 329 of Pliny\_5 in 18:59:221, he wrote, “... all these changes occur at the eighth degree of the signs of the zodiac, midwinter at the eighth degree of Capricorn, about December 26, the equinox at the eighth of the Ram, the summer solstice at the eighth of the Crab and the other equinox at the eighth of the scales ...” From these selections from Pliny we note that he agreed perfectly with Vitruvius and Columella.

The ancient Babylonians had two systems of mathematical astronomy for the moon, the earlier one called System A and the later one called System B. System A had the vernal equinox occur in the tenth degree of Aries and System B had the vernal equinox occur in the eighth degree of Aries. This is explained by Neugebauer on pages 594 and 596 of volume 2 of HAMA. Although the historical trail is not known, most of the Roman Empire in the first century followed the practice of Babylonian System B in placing the vernal equinox in the eighth degree of Aries. Page 600 of HAMA mentions that Hipparchus (c. 140 BCE), Ptolemy (c. 150 CE), and other earlier Greek astronomers placed the first day of Aries on the vernal equinox.

The Greek astronomer Geminus wrote an elementary book on astronomy translated with commentary by James Evans and J. Lennart Berggren. They date Geminus c. 90-35 BCE (p. 19). In this work, at 1:19 (p. 114), Geminus wrote, “Spring equinox occurs around the height of flowering time, [when the Sun is] in the first degree of Aries.” (The bracketed addition is by those translators.) The survival of this elementary Greek textbook of astronomy that avoided mathematics makes it reasonable to suppose that in the first century in Alexandria where the Greek astronomers were famous in their most

significant city, the educated people placed the first day of Aries on the vernal equinox. The sign of Aries in Alexandria no doubt began exactly where modern astronomers place it, at the vernal equinox, which is seven days later than in most of the Roman Empire in the first century. The famous work of mathematical astronomy known as the *Almagest* by Ptolemy, c. 150, had such a strong influence that its use of the vernal equinox at the beginning of Aries prevailed in the Mediterranean region after several centuries, but it was a slow process. On page 90 of Toomer's translation of the *Almagest*, we note, "We shall use the names of the signs of the zodiac for the twelve [30 degree-] divisions of the ecliptic, according to the system in which the divisions begin at the solstitial and equinoctial points. We call the first division, beginning at the spring equinox and going towards the rear with respect to the motion of the universe, 'Aries', the second 'Taurus', and so on for the rest, in the traditional order of the 12 signs." (The addition in brackets is by Toomer.)

In summary, the tradition of the skilled Greek astronomers including Hipparchus, Geminus, and Ptolemy, and from above, van der Waerden also included Hypsicles and Theon, was to place the vernal equinox at the start of Aries. On the other hand, the non-astronomers Pliny, Vitruvius, and Columella, wrote that the vernal equinox begins at the eighth degree of Aries. The city of Alexandria, islands near it, and possibly parts of Asia Minor promoted the terminology for Aries of the Greek mathematical astronomers, putting the vernal equinox at the beginning of the sign of Aries, but elsewhere in the Roman Empire, the terminology of Pliny was promoted in the first century, which put the vernal equinox on the eight day of the sign of Aries. Thus Pliny put the sign of Aries seven days earlier than the Greek astronomers.

Could Pliny be regarded as an astronomer? Books 2 and 18 of Pliny's *Natural History* contain astronomical matters. Olaf Pedersen 1986 surveyed Pliny's astronomical accomplishments. On page 189 Pedersen wrote, "The conclusion to be drawn from the preceding sketch of Pliny's astronomy must be that he was no astronomer, but a rather incompetent compiler of astronomical lore culled from a variety of sources, some of which were not of the purest water. Thus it is impossible to give him any place at all in the development of astronomy." Alexander Jones 1991 also commented on Pliny. On page 148 he wrote of Pliny, "He consulted and took notes on numerous writings on astronomy that have not otherwise come down to us, but he possessed neither the scientific competence necessary to understand the texts nor an adequate Latin technical vocabulary to make them intelligible to his reader." This will be important to understand Josephus later.

#### [8] Hellenism and the use of the signs of the Zodiac among Jews

The Greek language and its literature was spread into much of the Mediterranean region due to the settlements of Greek peoples in many parts of those lands over several

centuries. The Greeks so loved their language that they became bilingual in various places, thus refusing to give up their use of Greek. Apart from that, Alexander the Great promoted the use of the Greek language and Greek culture in his empire, which was soon split into four parts due to his early death. Without any influence from Alexander, Roman nobles in the capital city of Rome admired the Greek classics that primarily originated from Athens. Hence the Roman Empire also promoted the Greek language and Greek culture. Greek language and Greek culture was known as Hellenism.

The tiny town that Alexander commanded to be established as a great city to be named after him became Alexandria, soon the second largest city in the Roman Empire. Alexandria became a leading center for Hellenism. The Jewish philosopher Philo of Alexandria was well educated and Hellenism was part of his education. When the Greeks accepted the zodiac from the Babylonians, the Greeks promoted its use and thus the zodiac became part of Hellenism. The spread of Hellenism also penetrated to the Jews in Judea, but not as intensely as it did in Alexandria. Thus the zodiac also spread to the Jews generally. The zodiac was a division of the year that was part of Hellenism, but it was not a calendar. The signs of the zodiac were never called months.

Nevertheless it was possible to approximate the Jewish months with the time of the signs of the zodiac, and Philo did occasionally do this as part of his educational ingestion of Hellenism. When Philo does this, he needs to be understood in an approximate allegorical way. There are also some few writings among the Dead Sea Scrolls that use the names of the signs of the zodiac because of the influence of Hellenism. There are several different kinds of calendars found among the Dead Sea Scrolls, showing that Jews tolerated a wide variety of beliefs among themselves. Some of those calendars did not use the cycle of the moon for months, and these included the calendar promoted in the Book of Enoch and the Book of Jubilees (both rejected by Judaism into their Tanak).

The Kabbalah is Jewish mysticism that is claimed to have originated c. 165, long after the Temple was destroyed in 70 and the Jewish calendar had become corrupted through its acceptance of several divergent conditions to determine the first month. The Kabbalah mentions the zodiac, and this proves nothing about the biblical calendar. Also, some excavated synagogues show designs of the zodiac, which proves nothing about the biblical calendar, which was in place about 1000 years before the zodiac was invented by the Babylonians.

Rabbinic literature began with the Mishnah c. 200, and this was the first part of the two Talmuds (Palestinian Talmud c. 400 and Babylonian Talmud between 500 and 600). The adoption of some aspects of Hellenism with its zodiac among Jews also infiltrated the rabbinic writings, so that even those writings include reference to the signs of the zodiac. This also proves nothing about the original calendar in regard to the zodiac. Interested readers may examine the document [RL.pdf](#) for a discussion concerning the lack of

reliability of rabbinic literature for history and for its invented concept of the Oral Law and its occasional incorrect interpretations of the Torah as presented in the Pentateuch.

#### [9] The Sun is involved for Biblical Years

The lights seen in the sky are the sun, the moon, the stars, the planets, and comets. The comets do return periodically at a long time interval. For example Halley's Comet returns at a period of 75 years. Each planet has its own time period for circling the sun and it is different from the earth year. The stars have already been discussed, showing that due to precession of the equinoxes their appearance gradually shifts away from their annual stability so that the stars fail to qualify for the required long-term average of 365.2422 days. The moon cycle that averages 29.53 days has no light indicator to show how one particular month could be known to be the first month yet still adhere to the long-term required average. Only the sun remains to consider, so that the sun must be involved to determine biblical years.

#### [10] Light Triggers and the Vernal Equinox

In order to understand what is intended from Gen 1:14 for *years*, we should look for a consistent pattern in what we already know about the beginning of *days* and *months*. Light from the heavenly bodies is a trigger for the events described. The light trigger for distinguishing a new day is the transition from light to dark of the sun. The light trigger for beginning a new month is the new crescent in the western sky. Gen 1:14 declares that the lights themselves determine these matters, not a prediction of these lights, and not an approximate calculation of these lights.

For these two events (start of a day and start of a month):

- (1) The light trigger occurs at the beginning of the event; and
- (2) Only the lights themselves, no advance prediction or calculation is present. We should expect these two characteristics of a light trigger to apply to the determination of *years*. This continues the pattern.

To continue this biblical pattern we should expect these two characteristics of a light trigger to apply to the determination of each new year. Deut 11:12 has the expression "*from the beginning of the year*", showing that a biblical year has a definite beginning. Num 28:14 has the expression "*each month throughout the months of the year*". Hence a year consists of whole months, and the months are numbered as seen in Lev 23. We need to consider a light trigger that determines the first month. To be consistent with the pattern having the two characteristics described, we should seek a light trigger that identifies which new crescent is the first in the year, it should occur at or shortly before that event, and the trigger should not require advance prediction.

As already mentioned, the sun must be involved. There are only four repeatable signs of the sun that recur in an annual pattern: the two equinoxes and the two solstices. Among

these four, only the vernal equinox fits the time of the year that the Israelites left Egypt for the following reason.

Jer 36:22, “Now the king was sitting in the winter house in the ninth month, with [a fire] burning in the hearth before him.”

This shows that the ninth month occurs in the winter. Since there are roughly three months per season, this would imply that the sixth month occurs in the autumn, the third month occurs in the summer, and the first month occurs in the spring. Of course the spring begins with the vernal equinox. Another Scripture that corroborates the involvement of the vernal equinox is Ex 34:22, which calls the Feast of Weeks the “*firstfruits of the harvest of wheat*”. This occurs in Israel from about mid-May through early July. If you back up from this 50 days plus about another 20 with consideration for the count to the Feast of Weeks, that is about two months and 10 days. This also approximates the time of the vernal equinox. Hence two separate biblical identifiers lead to the vernal equinox. The other three signs of the sun are too far away in time to be candidates. Thus Scriptural descriptive approximations are used to point to the vernal equinox as the only candidate for Gen 1:14.

Therefore, from Gen 1:14 (along with some helping Scriptures) we note that the vernal equinox is the trigger of light from the sun that points to the new crescent that begins the first month on the day of the vernal equinox or afterward. This conclusion stems from the two above principles for the light triggers for the calendar. It avoids prediction and calculation.

[11] Starting with the Nearest New Crescent to the Vernal Equinox has problems

To keep matters simplest, let us suppose that the nearest new crescent to the vernal equinox is defined to be the new crescent whose 15th day of the month is on or after the vernal equinox.

This would mean when the new crescent for that month is seen, one would have to know in advance that when the 15th day arrives, it will be on or after the vernal equinox. Someone may argue why it should matter whether we know in advance. Why can't people merely wait until the 15th day arrives and compare that with the vernal equinox? In other words, why is it necessary to know at the beginning of the month whether it is the first month or the 13th? Consider the people in ancient Israel and what they were expected to do for the first month.

When people are expected to leave their homes to attend the Passover festival in one central location (Deut 12:5-7) throughout all Israel, they need to know at the beginning of the month whether it is the first month or the 13th month so they can make preparations of clothing, food, exchange of goods for silver, wagon repair, and long distance travel over hilly land (Deut 11:11, and most of Jerusalem is about 2500 feet

above sea level with Mt, Zion a few hundred feet higher). The whole family was ideally expected to go (Ex 12:25-27), so that travel was not rapid. They must prepare and leave in advance in order to arrive for the Passover. Once they arrive, it makes no sense for them to be told that the vernal equinox is one day later so that they need to go home and return one month later. Gen 1:14 literally speaks of the lights in the heavens, not predicted lights in the heaven.

The conclusion is that the new crescent that occurs on or after the vernal equinox begins the first month. This definition for the first month is a natural result from Gen 1:14 and a few other Scriptures that relate to the year, such as Deut 12:5-7.

This is not the only problem with using the nearest new crescent to the vernal equinox. In chapters soon to come, other evidence will be presented to show that the new crescent needs on or after the vernal equinox to begin the first month.

[12] What is the Biblical Vernal Equinox?

In this modern age astronomers define some astronomical terms in a way that would have been impossible for ancient people. This is primarily due to the fact that modern science has a three dimensional view of the solar system that ancient people did not have, and modern science recognizes that the sun is the body around which the other heavenly bodies of the solar system revolve compared to the ancient view that the sun and stars circled the earth (except for two known ancient astronomers whose views were not accepted). Another reason for differences in ancient definitions is that ancient people sometimes made incorrect assumptions besides the assumption that the sun and planets circled the earth. Comparatively few people among today's laymen have examined the ancient meaning of the vernal equinox, and hence there is much confusion over the meaning of the vernal equinox.

**The ancient meaning of the vernal equinox must be what ancient people could determine for themselves with ancient technology, and it must agree with the light principle of Gen 1:14.**

What is the meaning of the vernal equinox from the biblical viewpoint?

Is the vernal equinox when the daytime and the night are equal in length? The concept of equal daytime and night is really not part of what is implied in Gen 1:14 for lights in the heavens for ancient peoples. Equal daytime and night is not a light marker when you stop to think about it!! Instead, this concept of equal daytime and night involves an accurate *measure of time*, which is not a light marker. Night is not a light. The abstract concept of equal daytime and night requires a measure of night compared with a measure of daytime. This requires the existence of some instrument that can accurately measure time to almost one minute of accuracy in a day. During the days near the equinoxes, the length of daylight changes by two minutes per day, so that some

instrument that can accurately measure time to a resolution less than this would be required to make a true judgment of equal daytime and night. A measure of time for a night is not a light. The concept of equal daytime and night is really foreign to Gen 1:14.

The ancient Babylonians used a water clock to record and preserve the time of their eclipse observations. Modern computers with astronomy programs have compared their recorded eclipse times with computer generated accurate times for the lunar eclipses. The result is that the average error of their eclipse times is eight minutes, which is far in excess of the accuracy required to determine the time of equal daytime and night. The rate of water dropping varies according to the temperature. It is colder at night. From one night to the next night, the temperature will vary.

Until the year 1656 when Christiaan Huygens invented the pendulum clock, there were no known clocks accurate enough to determine when daytime and night were equal.

From page 353 of Ruggles 2005 we note the following about the three greatest pyramids in Egypt, all from Giza, “The sides of each of the Giza pyramids were carefully aligned upon the cardinal directions (north-south or east-west). This alignment followed established practice, but the accuracy with which it was achieved at Giza is truly impressive, particularly in the case of Khufu's pyramid [the greatest one]. Each of its sides is cardinally aligned to within six arc minutes, or one-tenth of a degree. This is equivalent to no more than one-fifth of the apparent diameter of the sun or moon. The other pyramids are only slightly less well aligned. Khafre's to within about eight arc minutes and Menkaure's to within sixteen.”

Estimates are that these pyramids were built before the time of Moses. In fact, radiocarbon dating, which makes some assumptions for its accuracy, dates these three pyramids to about 4500 BCE, near the time of the flood. The earth's axis and tilt has remained virtually constant for those years despite all the earthquakes and other upheavals this planet experienced because those pyramids have kept their east-west line in agreement with the equinoxes. When Ruggles used the term *equinox* in the above quote without any qualification, as a modern scientist he used it in a sense that agrees *in time* with the modern definition of equinox.

Certainly Moses was aware of the equinoxes from the knowledge he gained in his upbringing in Egypt (Acts 7:22), and the fact that the greatest pyramids had one wall aligned exactly east-west. Acts 7:22 reads [NKJV], “And Moses was learned in all the wisdom of the Egyptians, and was mighty in words and deeds.”

In Neugebauer 1980 a method was described that showed how ancient people could determine the day of the vernal equinox accurately. Here is a description of the method.

Set up a vertical pole in the ground with a pointed tip at the top so that the pole will not move in a wind. This should be set up on level ground where there are no shadow

obstructions such as nearby trees or tall buildings. The pole should be at least a yard tall for good results. About five feet would be more ideal.

During the days approaching the equinox and then for the two days following it, do the following.

From 9:00 am to 3:00 pm at half hour intervals do the following.

Put a thin vertical stick in the ground (like a thin ice cream pop stick) at the point on the ground where the tip of the pole casts a shadow on the ground. It only needs to stick up about 3 inches from the ground and sink enough so that a wind will not blow it over.

Then in the afternoon after 3:00 pm notice that for that one daytime the sticks trace out a curve on the ground.

Each day as you get closer to the equinox, the curve traced out by those sticks gets more like a straight line.

On the day of the equinox it becomes a straight line.

On the day following the equinox it becomes less like a straight line.

The vernal equinox is the day of the equinox when the weather is changing from cold toward hot in the northern hemisphere where Israel lies. This definition holds true for all areas except near the poles of the earth, although an obvious modification is needed for the southern hemisphere.

There is a spiritual significance to this straight line meaning of the vernal equinox. The straight line of the sun's shadow relates to the straight path of your behavior that does not go to the right or the left.

The spiritual meaning of the straight line as righteousness is seen in the following: Deut 5:32; 28:14; Josh 1:7; Ps 5:8; Isa 40:3; 42:16; Jer 31:9; Mat 3:3 etc.

Deut 5:32, "And you shall be careful to do as YHWH your Almighty commanded you. You shall not turn aside to the right or the left."

Mal 4:2, "But for you who fear My name the *sun* of righteousness will rise with healing in its wings, and you will go forth and skip about like calves from the stall."

This indicates sinless and perfect, and the authority to make a person righteous and healthy. Specifically the vernal equinox shows the perfect time to await the first month. Any other clock for this purpose is a counterfeit.

The modern definition of the equinox is equivalent to the ancient method of seeking the day on which the sun's shadow makes a straight line.

The biblical equinox is the straight line path, not equal daytime with night. Many ancient peoples made the **assumption that daytime and night were equal on the days of the equinoxes**, but this assumption was not capable of being verified in practice in ancient

times.

**This incorrect ancient assumption should be rejected as the biblical meaning of the equinox because the Almighty could not expect His ancient people to use a definition for which no instrument existed, and such an instrument is not a light in the heavens.**

Only the practical meaning that could be physically determined should be accepted, and this is the straight line path of the sun. The day of equal daytime and night varies by as much as several days depending on the latitude of the observer on the earth because the refraction of the sun's light rays differs according to the latitude, and refraction will alter the length of daytime.

It is unfortunate that the Latin word “equinox” literally means “equal night” according to its compositional parts. This word reflects the false assumption of the Romans who used this Latin word. We are saddled with this word, but it does not really define the ancient practical meaning of equinox.

[13] Adoption of the Babylonian Month Names in Jerusalem

In the year 539 BCE Persia defeated the Babylonian Empire and adopted the Babylonian calendar, although they did not prevent local calendars from continuing to exist. For example, the local Persian calendar (the Zoroastrian religious calendar) still continued and the Egyptian civil calendar still continued. In fact the Persians dated legal documents in both the Babylonian calendar and the Egyptian civil calendar, thus using two calendars simultaneously.

**One similarity between the Babylonian calendar and the ancient Jewish calendar is that both began their months with the sighting of the new crescent in the western sky near sunset.** The city of Babylon was at the Euphrates River and this was the primary place at which the Babylonian calendar and astronomical work was directed until the city was destroyed by the Romans in the first century. It was sometimes cloudy and rainy at this location, so that would sometimes prevent the sighting of the new crescent and thus cause some months to have the maximum of 30 days if there were successive days when the moon was not visible at the end of the old month. This put pressure on the Babylonians to try to predict the sighting of the new crescent. Not very long before the time of Alexander the Great, the Babylonians were quite successful at predicting the sighting of the new crescent, but this was kept a secret, and it was not until 1997 that a book was published on how they probably did this.

The Egyptian civil calendar had 12 months of 30 days each, plus five additional days, so that each year had exactly 365 days. In the ancient Persian capital city of Persepolis, ancient documents have been found with events dated in both the Persian version of the ancient Egyptian civil calendar and the Babylonian calendar. The Persian version of the

ancient Egyptian civil calendar also had 12 months of 30 days each, plus five additional days. However, the names of the months were different and the placement of the five additional days was different. A simple chart could be used to convert any date from the Egyptian civil calendar into its Persian version. All this illustrates that the Persian Empire did not demand uniformity in calendar usage within its empire.

Neh 5:14 shows that Nehemiah was appointed governor of Judah under the Persian King Artaxerxes. This shows that Judah was part of the Persian Empire, not a fully independent nation. Note the following words of Nehemiah in the context of Jerusalem and also recognizing that in Neh 13:17-21 the Sabbath was enforced by Nehemiah's command.

**Neh 13:30 “Thus I cleansed them [the people according to the law] from everything foreign and appointed duties for [the] priests and for [the] Levites each in his task.”**

Nehemiah had the authority to keep the religion pure even though Judah was part of the Persian Empire. Persia allowed the different peoples within its empire to keep their own religion.

Neh 8:2, “And Ezra the priest brought the law before the assembly of men and women and all who could hear with understanding on the first day of the seventh month [2320 *chodesh*].”

Neh 8:9, “And Nehemiah who [was] the governor, and Ezra the priest the scribe, and the Levites who taught the people, said to all the people: Today is holy to YHWH your Almighty.”

Since the day that is stated to be the first day of the seventh month is definitely declared to be holy by the Tanak, it must have been determined correctly, and this was after the return from the captivity under Ezra and Nehemiah. This, along with Neh 13:30 shows that the restored religion in Jerusalem included the correct calendar. The priesthood that was restored at the Temple kept the calendar correctly from the days of Ezra and Nehemiah until the first century as indicated in Luke 2:41-42.

In the context of Jerusalem in Ezra 6:15 there is mention of the month named Adar without mentioning that it is the twelfth month using the Babylonian month name.

In the context of Jerusalem in Neh 6:15 there is mention of the month named Elul without mentioning that it is the sixth month using the Babylonian month name.

In the context of Persia in Neh 1:1 there is mention of the month named Chislew without mentioning that it is the ninth month using the Babylonian month name.

In the context of Persia in Neh 2:1 there is mention of the month named Nisan without mentioning that it is the first month using the Babylonian month name.

We see that in Nehemiah, both in the context of Persia as well as in the context of

Jerusalem that Babylonian month names are used without mentioning the number of the month.

**We understand how the ancient Babylonian calendar worked because their eclipse records agree with modern computer simulation data for those eclipses. There are hundreds of eclipse records from ancient Babylon preserved on clay tablets between 747 BCE and the first century. A little less than 200 of them also have the time of day based on their water clocks. Using computers and the formulas of astronomy to compute the time of those eclipses that were time-stamped by the ancient astronomers, we know how the ancient Babylonian calendar worked.**

**From 499 BCE until the Babylonian calendar's last recorded year of 75 CE, its first day of the first month did not begin before the vernal equinox.** During the century from 499 to 400 BCE Nisan 1 fell on the day of the vernal equinox five times based upon the clay tablet evidence. Prior to the year 499 BCE the Babylonian calendar did allow the **beginning** of its first month Nisan to swing erratically on both sides of the vernal equinox. Ezra returned to Jerusalem in 457 (Ezra 7:7-9). Nehemiah returned in 444 BCE (Neh 2:1 and further). Neh 13:6-7 shows that Nehemiah was still active in Jerusalem in 432 BCE.

The very obvious fact that in Nehemiah above where the Babylonian month names appear both outside and inside Jerusalem without any month numbers yet there is no attempt to make any distinction in the use of the calendar of these month names based upon location is significant evidence that there would rarely be a difference between Nisan in the Babylonian calendar and Nisan in the Jewish calendar after 499 BCE.

**Based upon what the Jews would be able to notice in their environment in Babylon and Nehemiah's use of the same month names in Jerusalem, the Jewish calendar would use the rule that their first month would be the one whose new crescent would be seen on or first after the vernal equinox.** There is no simpler rule. **If there would often be a difference by one month, then it would cause confusion to use the same month name for different months within the same empire.**

The Babylonians were very secretive about their work in astronomy and the calendar. Their writings in this field were written in the Akkadian language with its nearly 500 symbols. We have no surviving record of their own explanation of their calendar. Whatever we know about it comes from examining the dates from their clay tablets written in the Akkadian language matched with eclipse records. The Aramaic language gradually replaced the Akkadian language so that by c. 700 BCE the Akkadian language was nearly a dead language. We have no knowledge about what the Jews knew about the Babylonian calendar from the time it was synchronized to the vernal equinox beginning in 499 BCE. Multitudes of Jews were living in Babylon, so they had constant opportunity to witness its operation, but whether they knew more of its theoretical

details is not known.

If the leadership of the Jews did know more about the theoretical operation of the Babylonian calendar, they may have kept it a secret.

**If the Jews had used the nearest new crescent to the vernal equinox to begin the first month instead of the new crescent that was on or after the vernal equinox, then half the time the first month would have been different, causing much confusion in society half the years.**

**If barley were used to determine the first month in some way, then that would also have caused confusion in many years because there would be two different months called Nisan and all months would be different that year.**

[14] The Passover Letter shows the Jerusalem Nisan was the Babylonian Nisanu

**A unique document written in Aramaic has survived from the year 419 / 418 BCE written on papyrus. This document is called the Passover Letter, and it is an exceptional witness to the use of the name Nisan for the first month in that year when the calendar of the Jews was correct in Jerusalem.**

About 500 miles south of the Mediterranean Sea in the Nile River, there was an island named Elephantine serving as the southern defensive base of Egypt to prevent an invasion from Sudan to the south. On that island the Persian Empire established a military base with mercenaries, many of whom were Jews.

In southern Egypt, the Persian Empire controlled the region that surrounds the city of Scyene and the island of Elephantine where ancient documents have been discovered with events dated in both the Egyptian civil calendar (exactly 365 days per year) and a long distance version of the Babylonian calendar. Both dates were used on most documents, and that was called double dating. Before 1990 there was a debate within the scholarly community concerning whether these documents were dated using the Jewish calendar or the Babylonian calendar, but since the 1990 paper by Bezalel Porten was published, we have solid grounds for the scholarly acceptance that a long distance version of the Babylonian calendar was used there.

Because the Babylonians kept their astronomy and their calendar secret in their details and the distance from the city of Babylon to the provincial administrative headquarters in Scyene is about 1000 miles, one may expect that on occasion there would be some discrepancy between the normal Babylonian calendar and its implementation in the region of Scyene that included the island of Elephantine close to Scyene. One kind of discrepancy is that the Babylonians began each month with the new crescent while the Egyptians began each month with the morning that followed the last seen old crescent in the eastern sky. Some scribes in that region used the Egyptian method to begin the month and some did not, yet they used the standard Babylonian month names. This

difference in how to begin the month could cause some month to begin one day before the Babylonian month. Travel from the city of Babylon to Scyene was not frequent so that on rare occasions a thirteenth month might be added in Babylon, but not added in the region of Scyene. Over 30 double dated documents have been found in the region and two of these show that a thirteenth month should have been added to make them agree with the Babylonian calendar in those two years, but a thirteenth month was neglected to be added. Jews in Jerusalem would generally not be aware of these unusual discrepancies between the Babylonian calendar and its long distance implementation in the region of Scyene.

**In the Passover Letter found buried on Elephantine, the Hebrew-Aramaic alphabetic characters in this letter along with an English translation are found on pages 56-57 of Lindenberger. In the following quotations from the letter, the square brackets and the contents within them appear on page 57 of Lindenberger. The letter contains “This year, year five of King Darius”, which dates the letter in 419/418 BCE. There are gaps in the letter because it is poorly preserved. The addressing of the letter says “[To] my brothers Yedanyah and his colleagues, the Jewish garrison, from your brother Hananyah”. It was written from one Jew in friendship to the Jews on the island with whom the author had familiarity. Part of the preserved text of the letter says, “Be scrupulously pure. Do not [do] any work [...]. Do not drink any [...] nor [eat] anything leavened [... at] sunset until the twenty-first day of Nisan [...]”.**

Another translation of this same segment of this letter is on page 283 of Whitters where he adds in square brackets some guesses in gaps in the text as follows, “be pure and take heed. [Do n]o work [on the 15th and the 21st day, no]r drink [fermented drink, nor eat] anything [in] which the[re] is leaven [from the 14th at] sundown until the 21st of Nis”.

Note that the final letter of Nisan is missing in the poorly preserved papyrus so only “Nis” is shown. This provides historical evidence that after the return from exile under Ezra and Nehemiah, Jews named the first month Nisan as a substitute for the word *aviv*. On page 283 Whitters comments, “The letter came from one Hananiah, who apparently wanted the Jews in Egypt to celebrate Passover and Unleavened Bread appropriately. The address and greeting rule out a local Egyptian official or Persian overlord.” If the name Nisan was not significant for the first month to Jews, the letter could simply have said the first month or used an expression with Abib (Hebrew *aviv*) to signify the first month. This should be accepted as ancient historical evidence outside the Tanak that Jews of the fifth century BCE considered the Babylonian month name Nisanu as equivalent to the first month of their year.

**There was a distance of over 500 miles from Jerusalem to the island of Elephantine ignoring the curves in the Nile River that would make the distance longer, and it**

**was all uphill from the mouth of the Nile River on the northern coast to Elephantine. It would not be feasible that this letter would get from Jerusalem to Elephantine in time for any report about the condition of barley in Israel, and nothing in the letter mentions barley or *aviv*. The fact that the name of the first month was changed from *aviv* to Nisan is also a strong indication that barley was not involved in the calendar.**

**This letter shows that the Jews in Jerusalem expected that Nisan in the Babylonian calendar used by Jews in Elephantine would be equivalent to Nisan in Jerusalem.**

[15] Philo explains when the First Month of the Biblical Year begins

In the writings of the Jew, Philo of Alexandria (c. 20 BCE– c. 50 CE), he urged his fellow Jews to regularly go to the Temple in Jerusalem to keep the festivals. He also wrote that the Jewish month begins with the sighting of the new crescent that appears *after* the conjunction (= astronomical new moon). This indicates that the priests who officiated at the Temple did use this cycle of the moon in the calendar they followed when Luke 2:41-42 prevailed. This is also evidence that the biblical calendar's months were based on a cycle of the moon and that a month did not begin with the conjunction.

There are several places in the writings of Josephus where he mentions the Macedonian name of a month and says that it is a lunar month, and finally mentions the Jewish month name (the Babylonian name) for this month. He does this for the sake of his primary audience, which is the Roman nobles who knew Greek and who may have known the month names in Greek. This also implies that the calendar used by Judaism in the Temple environment of Jerusalem was based on a cycle of the moon according to Josephus.

Hence both Philo and Josephus are witnesses that the calendar used in the Temple environment in Jerusalem had lunar months so that a cycle of the moon was used for a month. Luke 2:41-42 is evidence that this was the correct calendar. Acts also shows that Paul wanted to be in Jerusalem for some festivals, thus also showing approval to the calendar used in the Temple in Jerusalem.

It is necessary to establish some relationship between the calendar of Judaism at the Temple and Philo's thinking in order for Philo's comments on Gen 1:14 and Ex 12:2 to be relevant.

In Gen 1:14 where the Hebrew text has the plural of *moed*, which is typically translated seasons, or festivals, or appointed times, the Greek translation of the Tanak known as the Septuagint has the Greek word *kairos* (Strong's number 2540). The various versions of the Jewish Aramaic paraphrased translations of the Tanak known as the Aramaic Targums all interpret *moed* to include the meaning “festivals”. The Jewish commentaries of the middle ages also agree with this understanding of *moed*. In Lev 23 the Hebrew

*moed* occurs six times: Lev 23:2, 2, 4, 4, 37, 44. The association of *moed* with festivals is clear from its use in Lev 23 as well as in Ps 104:19 and elsewhere. In contrast to this, *kairos* occurs in Lev 23:4, but nowhere else in the Septuagint of Lev 23. In Greek, *kairos* is a very general word for time, and it is not noted for being associated with the festivals or any other regular repetitive time. Thus one would not particularly expect Philo to interpret *kairos* as festivals, and indeed Philo does not interpret it that way. However, he does use the word *kairos* in discussing this portion of Gen 1:14, indicating that in his version of the Septuagint Gen 1:14 is similar to the one that is commonly available to us.

Philo discusses Gen 1:14-16 on pages 34-47 of Philo\_1 (*On the Creation* 45-61). On pages 44-45 (paragraph 59) Philo wrote, “By ‘appointed times’ [*kairos*] Moses understood the four seasons of the year, and surely with good reason.”

It is a little humorous that he puts this interpretation in Moses’ mind as if to say this is what Moses knew it to mean rather than this is Philo's interpretation. Since the four seasons are bounded by the equinoxes and the solstices, he certainly believes that Gen 1:14 includes these astronomical events. On pages 46-47 (paragraph 60) Philo continues, “The heavenly bodies were created also to furnish measures of time: for it is by regular revolutions of sun, moon, and the other bodies that days, and months, and years were constituted.” Since the calendar is based on these units and he declares these units to be based on measures of time of the heavenly bodies, he leaves no place for the barley to be the determining factor for the first month. The reader might be curious about why Philo wrote here “and the other bodies”. While we know that the Greek astronomer Hipparchus proved that the stars shift very slowly from the equinoxes, and he discovered this about 100 years before Philo was born, this knowledge had not been popularized and accepted, so that Philo does not know about precession. Thus Philo implies the thought that the cycle of the appearance of stars agrees with the sun’s signs of the equinoxes and solstices that make the seasons. If Philo had been familiar with the Hebrew text of Gen 1:14, he would have made the association of the Greek *kairos* with the Hebrew *moed*, and then would have linked this to the festivals using the contexts of *moed* in Lev 23. Instead of linking *kairos* to the festivals, he links it to the four seasons, indicating the equinoxes and solstices.

Philo wrote on page 151 of Philo\_7 (Special Laws I.90), “Who else could have shewn us nights and days and months and years and time in general except the revolutions, harmonious and grand beyond all description, of the sun and the moon and the other stars?” ***Notice that the way Philo asks this question emphatically shows that agriculture is not the way to determine years and the first month.*** Again Philo leaves no place for the use of barley in calendric determinations. If, on an annual basis, the Jews in Alexandria had to wait for a report on the state of the barley from the priests in Judea in order to know when to leave for a journey to keep the feast of unleavened bread

at the Temple in Jerusalem, Philo would not neglect such an important annual event in its role to determine the time of the first month. In this matter the Septuagint has no distortion that would give Philo a reason to have a prejudice against the use of barley, but he surely knows nothing of the role of barley in the early first century to determine the first month.

Having examined Gen 1:14 in Philo's writings, the next step is to consider his comments on Ex 12:2.

Philo was well educated, but not in the area of mathematical astronomy. Nevertheless it is almost certain that he would understand that the first day of Aries was the day of the vernal equinox as taught by the astronomers in Alexandria, which was unlike most of the Roman Empire in the first century where the eighth day of Aries was taken as the vernal equinox. Secular society outside of Alexandria also considered the autumnal equinox to occur on the eighth day of the sign of the zodiac called the Scales.

Philo discusses Ex 12:2 on pages 2-5 of Philo\_QE (Exodus, Book 1.1). On page 2 he wrote, “‘This month (shall be) for you the beginning of months; it is the first in the months of the year.’ (Scripture) thinks it proper to reckon the cycle of months from the vernal equinox. Moreover, (this month) is said to be the ‘first’ and the ‘beginning’ by synonymy, since these (terms) are explained by each other, for it is said to be the first in order and in power; similarly that time which proceeds from the vernal equinox also appears (as) the beginning both in order and in power, in the same way as the head (is the beginning) of a living creature. And thus those who are learned in astronomy have given this name [the Ram] to the before-mentioned time [the vernal equinox]. For they [astronomers] call the Ram the head of the zodiac since in it the sun appears to produce the vernal equinox.” Then on page 3 he writes, “And that (Scripture) presupposes the vernal equinox to be the beginning of the cycle of months is clear from the notions of time held in the ordinances and traditions of various nations.”

My commentary to this last sentence is based on page 391 of Samuel 1988, which states, “In the areas of Syria and the East controlled by the Seleucid kings, the Macedonian calendar was adjusted to make its months coincide with the months of the Babylonian calendar, which was in turn regulated locally by a nineteen-year cycle. The system was in general use in the East, and persisted in an adjusted form in cities all over the eastern regions well into the period of Roman domination.” The first day of Nisan in the Babylonian calendar since 499 BCE fell on or after the vernal equinox. Although Parker and Dubberstein show an exception to this in the year 384 (page 34), this alleged exception should be corrected because it is now regarded to be a faulty examination of a cuneiform text; see pp. 14 and 16 in Aaboe and others 1991.

When Philo speaks of the “traditions of various nations”, from Samuel’s statement he is referring to the continuation of the Babylonian calendar whose first month did not begin

before the day of the vernal equinox. This is the only place where Philo makes a statement about the first month that is capable of some explicit comparison with the vernal equinox.

[16] Summary of Evidence that favors Specific use of the Vernal Equinox

(1) Gen 1:14-18; Ex 34:22; Jer 36:22 were explained to show that a light trigger from a heavenly light determines the beginning of the year, and specifically the light trigger is the vernal equinox. The new crescent on or after the day of the vernal equinox begins the first month of the year, using Deut 12:5-7 ("one place" and the needed time to arrive).

(2) The Babylonian calendar's first month was named Nisanu, which the Jews transliterated into Hebrew as Nisan. From 499 BCE onward the Babylonian calendar did not permit Nisan to begin before the vernal equinox. Ezra 6:15; Neh 6:15 show the use of Babylonian month names in Jerusalem, yet with Jews using these names throughout the Persian Empire.

(3) The Passover Letter in 419/418 BCE, written from a Jew in Judea to Jews on the island of Elephantine near the southern border of Egypt where Persians administered the Babylonian calendar, explained that Nisan was the month of Passover. This shows that the Jew who wrote the letter from Judea expected that Nisan in the Babylonian calendar would be the same as Nisan in Judea, since that was the month of Passover. Thus this letter that has survived in the very dry desert from over 2400 years ago on this island is primary historical evidence that the month names in Jerusalem were expected to agree in time with the same month names in Persia.

(4) Philo of Alexandria in the first century states that the vernal equinox begins the first month as in other nations (those toward the east still used the Babylonian calendar).

[17] Astronomy and *tkufah*: its Meaning as Season and Ex 34:22

It is natural for the reader to request explicit biblical evidence that the vernal equinox is mentioned in the Bible. Plausible evidence that it was part of the culture of ancient Israel has been given above, based upon Gen 1:14 and several other Scriptures that relate to attending the Days of Unleavened Bread at one central location within Israel and the need to know that it is time to prepare to leave for that festival at the beginning of that month. Hence comparison of the start of that month with the vernal equinox becomes a requirement, without a future prediction of the vernal equinox that may later prove to be incorrect.

Ps 19:1-6 is most certainly an astronomical context that has the Hebrew word *tkufah*, which is Strong's number 8622 in verse 6. The end of verse 6 states "nothing is covered from its [the sun's] heat". The heat of the sun is noteworthy in the summer, and the summer begins with the summer solstice. The summer solstice introduces the approximate time of the beginning of heat, although it is hotter later in the summer.

Many Hebrew words have multiple meanings, and in the poetic language of the psalms, the originally intended meaning of some words is certainly debatable. My literal version of translating verses 4-6 is presented next. **Two translations of verse 6 are shown below** and this is not easy to translate in a fashion that makes all of its words clear because of what the reader is expected to understand about astronomy in the context. The only difference in these two translations is for the word *tkufah*.

Jewish scholars who have placed verse numberings in their Hebrew text, have labeled verse 1 only for the title “To the chief musician. A psalm of David”. Hence the Hebrew text labels verses 4-6 as verses 5-7, and the latter numbering is often used in the reference BDB. The most significant key to understanding the context of verse 6 is the use of the Hebrew word *katseh* in verse 4 and also at the start of verse 6, and the related word *katsah* beyond the middle of verse 6. The use of these three places is highlighted in square brackets in the literal translation below and the location in BDB is also shown.

Ps 19:4, “Their [= the heavenly bodies] trail has gone through all the earth, and into [the] end [7097 *katseh* BDB p. 892 left middle] of [the] world. Their-decrees [4405 *meelah* BDB p. 576 left bottom] for [the] sun have established a tent [= boundaries of travel during the course of a full year] in them [= in the decrees].

Ps 19:5, And he [= the sun] goes out from his chamber as a bridegroom. He rejoices like a mighty [man] to run its path [734 *orach* BDB p. 73 left middle].

Ps 19:6, He [= the sun] goes forth [4161 *motsa* BDB p. 425 right middle] from [the] end [7097 *katseh* BDB p. 892 left middle] of the heavens and his summer-solstice [8622 *tkufah* BDB p. 880 right bottom] in-accordance-with [the] ends-of-them [7098 *katsah* BDB p. 892 right top], and nothing is covered from its heat.

Ps 19:6, He [= the sun] goes forth [4161 *motsa* BDB p. 425 right middle] from [the] end [7097 *katseh* BDB p. 892 left middle] of the heavens and his [summer] season [8622 *tkufah* BDB p. 880 right bottom] in-accordance-with [the] ends-of-them [7098 *katsah* BDB p. 892 right top], and nothing is covered from its heat.”

The sun reaches its most northern daily path at the summer solstice when the amount of daylight is the longest in the northern hemisphere. This most northern path is in fact an “end” of all the daily paths during the year and relates to 7097 in verse 6. The forms of 7097 in both verses 4 and 6 are in the singular, translated “end”. In verse 6 the use of 7098 is in the plural form ending *-ot* and with a final letter *mem* at its termination. The reference AKOT in Ps 19:7 states “p” for the plural form at this Hebrew expression. Kohlenberger's interlinear for this expression correctly shows “ends-of-them” where the final *mem* means “of them”. Although AKOT is strict in its statement of the grammatical form of the word as “p” for plural, their interlinear translation is sometimes sloppy if it appears to be difficult to translate in a way that makes common sense, and hence AKOT wrote “end of them” instead of the literal “ends of them”.

Now the question arises concerning the meaning of the plural “ends”. In verse 4 we note the use of “tent” that was established by decrees, the laws of physics spoken by the Almighty, that keep the position of the sun within its bounds of travel. This tent is the visible boundaries of travel of the sun during the course of a full year. There are two annual ends of travel. The northern end is defined by the path of the sun at the summer solstice and the southern end is defined by the path of the sun at the winter solstice. Verse 6 looks at the totality of paths of the sun as those paths appear from one place in the northern hemisphere (rather than to what occurs on any single day).

In both translations of verse 6 above there is the expression “in-accordance-with” that is found on p. 754 (left upper) in BDB for the Hebrew preposition *al*, which is Strong's numbers 5920-5921. On line 10 BDB has “*in accordance with* a law”. Here this refers to the decrees from verse 4 (spoken words of the Almighty that established the laws of physics that govern the movement of the sun). Verse 4 calls this the tent of the sun's movement. The northern boundary of the tent is the summer solstice and the southern boundary of the tent is the winter solstice.

Since the greater part of the heat of the sun is felt during the middle of the summer, it seems more appropriate to accept the meaning of “summer-season” rather than “summer-solstice” for *tkufah* in Ps 19:6. Here is a paraphrase of Ps 19:6 based on the whole context.

Ps 19:6, “The sun goes forth from the [northern] end of the heavens and its summer season in accordance with the boundaries of its decrees, and nothing is covered from its heat.”

In the book chapter by Johann Maier one of the Dead Sea Scrolls is discussed that contains the Hebrew word *tkufah*. On p. 146 Maier wrote, “The Songs themselves are attached to the thirteen Sabbaths of one quarter or season (*tqufah*) of a year, according to the editor the first quarter (the Nisan season) only.” Here we see the Hebrew word *tkufah* used for the season of spring, which begins with the vernal equinox and ends with the summer solstice. This shows that in the culture of the first century in Judea the word *tkufah* was used for the season that began with the vernal equinox and ended with the summer solstice.

In the lexicon LVTL *tkufah* appears on p. 1039 where the meaning “solstitial point” is given in Ps 19:6, and for Ex 34:22 it gives the German word that means “equinox”. (LVTL gives meanings in a mixture of English and German.) The same meanings are given for these verses on p. 394 in the lexicon by Holladay 1971.

In BDB on p. 880 at the bottom right, the meaning for *tkufah* is “coming round, circuit”. This guess for its meaning will also lead to BDB's subjective meaning for the preposition *lh* (the single letter *lamed*) that is prefixed to *tkufah* in both I Sam 1:20 and II Chr 24:23 to be discussed next. This prepositional prefix is discussed on pp. 510-518

of BDB. Meaning 6 concerns the context “of time”, and this is discussed with categories and examples from p. 516 right bottom to p. 517 left middle. In this section, the following meanings for this preposition are seen: (a) “at”; (b) “on”; (c) “against”; (d) “for”; (e) “before”; (f) “hereafter”; (g) “when”; (h) “to denote the *close* of a period [of time]”; (i) “towards”; (j) “to”; (k) “for”; and (l) “during”.

Since the meaning of “[summer] season” for *tkufah* was indicated from the context of Ps 19:6, this concept of season will be kept in mind for the sake of consistency, if possible, in other examples. A meaning for the prepositional prefix *lh* will be selected from those given above by BDB.

II Chr 24:23, “And it came to be during [the spring] season [= *tkufah*] of the year [the] army of Aram marched against him.”

Here the word “during” was used for the prepositional prefix *lh*.

I Sam 1:20 is an interesting challenge to translate, but there is a very plausible explanation that leads to consistency with the above. First a translation will be given, and then an explanation will follow.

I Sam 1:20, “And it came to be at-the-close-of [two] full seasons [= *tkufah* in the plural form] Hannah conceived and she gave birth to a son.”

Here the expression “at-the-close-of” was used for the prepositional prefix *lh*. The expression with *tkufah* in the plural in the Hebrew is literally “seasons of the days”. This is a parallel to the biblical idiom “month of days” where the word “month” is *chodesh* in Gen 29:14; Num 11:20, 21 and the word “month” is *yerach* in Deut 21:13; II Ki 15:13. Virtually all translations take the expression “month of days” to mean “full month”. Through parallelism with the concept of “days”, “seasons of the days” would mean “full seasons”. In Dan 7:25 we find “for time, times, and half a time”. Here the plural “times” without any qualifier is taken by commentaries to mean “two”. Parallelism with this example would imply that the meaning is “two full seasons” as in the above translation.

From the above, it is sensible that *tkufah* means “season” in Ps 19:6; I Sam 1:20; II Chr 24:23. The only other example with *tkufah* is in Ex 34:22 to be discussed next.

A literal translation of Ex 34:22 is, “And you shall observe [the] Feast of Weeks, [the] firstfruits of [the] harvest of wheat, and [the] Feast of the Ingathering [during the autumn] season [= *tkufah*] of the year.”

In the above translation it is plausible that ancient Israelites understood that the preposition *lh* was implied because of its use in I Sam 1:20 and II Chr 24:23. The addition of the word “during” comes from one of the choices above from BDB.

Thus all four uses of *tkufah* may sensibly be translated as “season” in the sense of the four seasons of the year. These examples show summer, spring, and autumn. All four

seasons are bounded by an equinox and a solstice. Hence there is biblical evidence that the ancient Israelite culture included the use of the equinoxes and the solstices.

Consistency in meaning that is sensible in all contexts is a strong argument in favor of “season” for the meaning of *tkufah*. There is no technical reason that *tkufah* should refer to the harvest of crops, especially when *tkufah* occurs in a clearly astronomical context in Ps 19:6.

Ex 23:16 has the literal ending, “... and [the] Feast of the Ingathering at [the] end of the year in your gathering of your produce from the field”. The year in ancient Israel is often taken to have a reckoning from spring to spring as the religious year, and a reckoning from fall to fall as the civil year. In this latter sense of the civil year, the word “end” would apply.

Gen 1:14 does not have the word *tkufah*, but at least we can say that the Hebrew language does show the awareness of quarter year seasons beginning with an equinox or a solstice according to the Dead Sea Scrolls as well as according to its use in Scripture.

#### [18] Introduction to Anatolius and the Easter Rule

This chapter presents a partial preview into history beyond the first century concerning the calendar. One goal of this document is to present some recoverable historical stepping stones showing the departure of ancient Jews and Christians from the calendar present in biblical times to what eventually prevailed long after the Temple was destroyed. There is evidence in the writings of Origen c. 240 and John Chrysostom c. 400 that some Christians were attending Sabbath services along with the Jews, and that there were other kinds of cultural interactions between some Jews and some Christians living in the same environs. It is to be expected that where the scanty remains of prior history of the Jews became clouded with uncertainty, that subsequent scholars of both groups may have difficulty giving convincing advice to laymen who desire to know what should be correct practice. Sometimes an event of history that does not deserve major significance becomes very noteworthy because of prominent publicity in surviving historical writing.

Eusebius, Bishop of Caesarea, became a Christian historian of particular importance during the greater period surrounding the Council of Nicaea in 325. The most noteworthy witness that he held up in esteem to support the mainstream method that came to be used to determine the first month of the church year in which Easter was celebrated, is Anatolius. Since one writing of Anatolius has the most detail that could be presented by Eusebius, and because the achievements of Anatolius were highly praised by Eusebius, it is to be expected that his views would sometimes be tenaciously latched upon as authoritative and correct, especially if his evidence was accepted as a truthful representation of historical reality. Anatolius wrote his short work titled *About the Reasoning of Passover* c. 277, only about 23 years after the death of Origen. This work

was translated from its original Greek into Latin a little more than a century later by Rufinus. This Latin translation shows much more care for details than the partial Greek version that we are left with from Eusebius. Modern scholars are reluctant to accept Eusebius at face value in many areas where he is prone to bias, and thus the Latin translation by Rufinus should be given greater weight. The original Greek from Anatolius himself is lost, and Eusebius only reproduces part of it. Because Anatolius has been made a prominent stepping stone concerning the calendar through the attention given him by Eusebius, he is given more attention than he perhaps deserves after all the alleged evidence is examined.

The earliest surviving **rabbinic** work of the Jews on general principles for the determination of the first month of the calendar year after the destruction of the Temple in 70 is the Tosefta from about roughly c. 250. This work is more than three times the size of the Mishnah c. 200, and it is to be expected that the Tosefta occupied several decades of work by the rabbis in Galilee. Prior to the Mishnah and Tosefta we have some Jewish literature by the first century writers Josephus and Philo on the calendar that require some discussion. There is nothing from the Jews that survives between these documents from the first century until the Mishnah and Tosefta except the evidence concerning the practice of the Jews c. 230-245 from Origen. The Mishnah c. 200 discusses the determination of the beginning of the month, but not specific general principles for the beginning of the year.

People vary in how they approach the question of the timing of the biblical first month. People today are generally aware that when the Jews keep their Passover in modern society, in most years the majority of Christians keep Easter on the following Sunday. It is reasonable for such a person to ask how the Roman Catholic Church decided on the general method to determine the month of Easter, which is the first month from the viewpoint of the Roman Catholic Church. Upon examining this, it is common to look at the Ecclesiastical History of Eusebius where Anatolius is put upon a pedestal, in the sense that he is held up in esteem for his scholarship and insight into the question of the correct timing for Easter.

In 1582 Pope Gregory announced a change in the calendar, thus abandoning the Julian calendar and inaugurating the Gregorian calendar. The goal of the new Gregorian calendar was to fix March 20/21 to be the annual date of the vernal equinox, which was thought to be the date of the vernal equinox at the general historical time when the Council of Nicaea met in 325. Eusebius wrote a history of this council in his Ecclesiastical History.

On the 400th anniversary (1982) of the proclamation of the establishment of the Gregorian calendar, a conference was held and jointly sponsored by the Pontifical Academy of Sciences and the Pontifical Vatican Observatory in Rome. Several papers

that were presented at this conference in 1982 were authored by historians of astronomy. These papers were published in one volume in 1983, which is the reference abbreviated GRC. Internationally respected historians of ancient astronomy Olaf Pedersen and John D. North authored two of these papers, and they will be quoted below.

On pp. 30-31 of Pedersen 1983 we note, “There is no doubt whatever that the only place where these [mathematical calendric] problems [to determine the first month for the Church] could be properly tackled was Alexandria, the intellectual capital of the Hellenistic world where there was, all through the first Christian centuries, a competent school of astronomers and experts in time reckoning. Its best known representatives were the non-Christian scholars Ptolemy in the second and Theon on the fourth century. We do not know whether the Metropolitan Bishop of Alexandria consulted these experts. But it is certain that the Early Church in many places looked to Alexandria as the city where information about Easter could be obtained. In the third century we hear of Alexandrian bishops sending letters to other Churches before Easter, announcing the date on which the feast was going to be observed in Alexandria. This was the case of Bishop Demetrius (d.c. 232) who wrote such Pashal letters to the bishops of Rome, Antioch and Jerusalem, and also of Bishop Dionysius the Great (d.c. 264) who wrote to the otherwise unknown Flavius, Domitius and Didymus, presumably suffragan bishops in Egypt. This custom prevailed long after the Easter problem [the method to determine the date] had been settled, and the universal practice of bishops sending pastoral letters to their clergy during Lent is a direct outcome of the dependence of the Early Church on Alexandria for obtaining information on Easter.”

**No mathematical outline or astronomical principles remain concerning how certain church leaders in Alexandria computed the determination of Easter during the earliest years of its practice from c. 230. At this time Origen still lived in Alexandria, his birthplace, and he surely took note of what transpired for future study and comment.** The estimated year of 230 comes from Pedersen's above estimate of the death of Bishop Demetrius c. 232 and that he sent letters of the calculated date for the celebration of Pascha to other churches.

On p. 31 Pedersen wrote, “... spring begins at the vernal equinox which the Alexandrians placed on March 21 (in the Julian calendar).” On p. 31, “The earliest indication of how the Alexandrian Church went about this business is found in Eusebius’s account of Dionysius’s letter to Domitius and Didymus in which he *published an eight year Easter Canon at the same time as he stated that Easter should never be celebrated until after the vernal equinox* [Eusebius’s Ecclesiastical History 7:20].”

This above rule from c. 250 allows Nisan 1 to occur about two weeks before the vernal equinox. History has not preserved explicit information dating from c. 250 concerning

how the Bishop of Alexandria decided on the above method to determine the first month, according to Eusebius. There are indirect ways to make an intelligent guess of how this happened. Josephus made a statement in his *Antiquities of the Jews* concerning the first month Nisan. In order to understand what he meant, some background information on the meaning of Aries needs to be presented. This present chapter gives the reader a peek ahead into later developments to be discussed, and supplies a motivation for presenting certain topics.

[19] Authority in Israel Distorted by Josephus

(A) Josephus on the Biblical Court System and the Biblical King

In matters pertaining to human authority over the Israelite people concerning the biblical court system, it is instructive to see how Scripture compares with Josephus. Deut 17:8-13 discusses what to do when difficult legal cases arise and the local judges cannot decide. Verse 8 together with Deut 12:5 (as interpreted in the later context when Jerusalem would be the capital city), indicate that such cases would be transferred to Jerusalem. Deut 17:9 explains what should happen next. The authority figures are mentioned in Deut 17:9 [NKJV], “And you shall come to the priests, the Levites, and to the judge there in those days, and inquire of them; they shall pronounce upon you the sentence of judgment.” Verse 12 states that the verdict is given by “the priest” or “the judge”. This should be understood in light of Deut 19:17 where a single case is brought before “the priests and the judges”. When this is read by itself without looking outside the Bible for interpretation, we do not read about one national body meeting under one roof (one Sanhedrin), but instead, individuals from among priests, Levites, and “the judge”; however, an unstated quantity of these people judge each case. Verse 9 indicates a plurality of people in authority with emphasis on priests and others of the tribe of Levi, but people from other tribes are not excluded from serving on the court. In Deut 21:5 where the cities all over the country are in the context (verses 1-9), the priests are said to be involved in settling every dispute. There is nothing specific in the Tanak to cause one to insist that the same single body of people in Jerusalem is to judge every case that cannot be decided by local courts throughout the land.

Note that Deut 17:8 does say “gates”, which means courts, and it should be accepted that Deut 17:9 necessarily implies at least one court for judging civil cases brought to it from local courts. This permits the likelihood, especially if the population is large, that there would be a group of high-level courts in Jerusalem, and any case that is too difficult for the local courts may be assigned to one of these courts. On the other hand, this may also be interpreted so that if the population were large, Jerusalem would have an intermediate level of courts that would first consider cases brought to it from local courts, and then any cases that could not be resolved by these intermediate level courts would go to one highest court. The Pentateuch does not assign any specific role to the high priest within

the court system, but priests do have a prominent role throughout the court system (Deut 17:9; 19:17; 21:5).

When reading Josephus concerning the court system, we must carefully distinguish between his portrayal of the law of Moses and his statement of what actually happened in Jerusalem according to his personal experience as he chooses to tell it. After devoting a considerable number of pages to history, Josephus returns to discussing the law of Moses, and provides a preparatory comment as follows in Ant 4:196 (pp. 569, 571 in Josephus\_4), “But here I am fain first to describe this constitution, consonant as it was with the reputation of the virtue of Moses, and withal to enable my readers thereby to learn what was the nature of our laws from the first, and then to revert to the rest of the narrative. All is here written as he left it: nothing have we added for the sake of embellishment, nothing which has not been bequeathed by Moses.” The readers of Josephus understand the constitution to be the laws by which the country is governed, and he uses this word to refer to the laws of Moses that pertain to the government and possibly some other laws as well.

In Josephus's version of the local courts in the law of Moses, he wrote on p. 579 in Josephus\_4, Ant 4:214, “As rulers let each city have seven men long exercised in virtue and in the pursuit of justice; and to each magistracy let there be assigned two subordinate officers of the tribe of Levi.” Here Josephus adds specific numbers of people to serve as rulers, and he certainly does not leave out the tribe of Levi entirely, but he does not require any role for priests and insists on at least a minor role for Levites. This is clearly a distortion of the major biblical role for priests.

We next examine the situation in which a case is too difficult for a local court. This is parallel to Deut 17:9. A careful translation of Josephus's Ant 4:218 is given on p. 32 of Pearce, “But if the judges do not understand how they should give judgment about the things that have been laid before them - and many such things happen to people - let them send the case up untouched to the holy city, and when the chief priest and the prophet and the senate [Greek: *sunedrion* (Sanhedrin)] have come together, let them give judgment as to what seems fit.” Note that Deut 17:9 gave a primary role to the priests and Levites without mentioning the high priest. Josephus adds the high priest, but does not insist on any other priests, although he may assume this is to be included in the Sanhedrin. He also maintains that Moses intends there to be only one high court, the one national Sanhedrin. Josephus also includes “the prophet” within the meeting of the Sanhedrin, a matter about which Moses wrote nothing. In several ways Josephus distorts the natural meaning of the biblical account.

Several years after Josephus wrote his *Antiquities of the Jews*, he wrote his last work, *Against Apion*. In this last work he was not giving a thorough treatise on the law of Moses, but he did mention the attitude of the Jews toward this law, and then he made a

few statements about the law in relation to the court system. In AA 2:183 (p. 367 of Josephus\_1) he wrote, “To us [Jews], on the other hand, the only wisdom, the only virtue, consists in refraining absolutely from every action, from every thought that is contrary to the laws originally laid down.” Concerning the court system he contradicted his earlier statements above where he previously diminished the role of the priests in the court system and governing in general, except for the high priest. In AA 2:187 (pp. 367, 369 of Josephus\_1) he wrote, “But this charge [for the priests] further embraced a strict superintendence of the Law and of the pursuits of everyday life; for the appointed duties of the priests included general supervision, the trial of cases of litigation, and the punishment of condemned persons.” In AA 2:193-194 (p. 371 of Josephus\_1) he wrote, “The priests are continually engaged in His worship, under the leadership of him who for the time is head of the line. With his colleagues he will sacrifice to God, safeguard the laws, adjudicate in cases of dispute, and punish those convicted of crime. Any who disobey him will pay the penalty as for impiety towards God Himself.” In this context Josephus is summarizing the ideal form of government as a theocracy controlled by priests as it was supposed to be in the sacred writings of the Jews. Here he makes no explicit mention of what happened in his lifetime, but the assumption is that this did parallel what occurred in his lifetime. Of course he knew the correct biblical role of the priests in the court system when he wrote his earlier work, but in that earlier work he deflated the role of the priesthood within the court system. This does show inconsistency in Josephus. However, even in his last work he did not mention Levites, but only the subgroup of the Levites called priests. Often scholars disagree with one another in their conjectures for his motives.

In Deut 17:14-20 Moses describes the appropriate behavior for future kings of Israel, and this does not show that the king should share his rulership with other men.

Comparing this to the corresponding description in Josephus, we see the following on p. 583 of Josephus\_4, Ant 4:224, “Let him [any future king of Israel] concede to the laws and to God the possession of superior wisdom, and let him do nothing without the high priest and the counsel of his senators ...” Here Josephus puts a non-biblical restraint upon the king's authority so as to force him to share it with the high priest and a body of officials. This is a significant distortion of the authority of the king in ancient Israel.

Josh 2 describes the spying mission of two men into Jericho, and verse 23 states [NKJV], “So the two men returned, descended from the mountain, and crossed over; and they came to Joshua the son of Nun, and told him all that had befallen them.”

Comparing this to the corresponding description in Josephus, we see the following on p. 9 of Josephus\_5, Ant 5:15, “So having made this compact, they departed, letting themselves down the wall by a rope and, when safely restored to their friends, they recounted their adventures in the city. Joshua thereupon reported to Eleazar the high priest and to the council of elders what the spies had sworn to Rahab; and they ratified

the oath.” Here Josephus portrays an authoritative decision to accept the private agreement between the two spies and Rahab being officially accepted only by mutual agreement of Joshua along with the high priest and a senate. Thus Josephus shows Joshua as unable to make this authoritative decision alone. Hence Josephus distorts the Bible.

Using singular verbs in the Hebrew, Joshua is told in Josh 1:5, “As I was with Moses, I will be with you.” This is one man rule in a theocracy, but Josephus transformed it into rule by a committee with a high priest.

These several examples of biblically distorted interpretation from Josephus show a bias of elevating the authority of the high priest and one national senate or Sanhedrin so that Joshua and future kings are expected to share authority with them rather than act alone in political or civil matters. This had the effect of weakening the authority of Joshua and the kings of Israel, all having one-man rulership. But in *Antiquities of the Jews* Josephus diminished the role of the priests and Levites in the court system of Israel compared to the Tanak. Yet in *Against Apion* Josephus gave proper emphasis to the priesthood, but still neglected the Levites.

#### (B) Resolving Contradictions in Josephus over who had greater Authority

Let us summarize some of the contradictions in Josephus concerning his portrayal of the biblical court system and authority in general. In *Against Apion* (abbreviated AA and published c. 100) the court system gives much authority to the priesthood, and even outside the court system the priesthood has the greatest visible authority. Notice the next passage.

In AA 2:188-189 (p. 369 of Josephus\_1), Josephus wrote, “Could there be a more saintly government than that? Could God be more worthily honoured than by such a scheme, under which religion is the end and aim of the training of the entire community, ***the priests are entrusted with the special charge of it***, and the whole administration of the state resembles some sacred ceremony?” Here Josephus gives the priests the sole authority over the religion and sacred ceremony. Of course this assumes that Jewish society is normal, i. e., that the priesthood is practicing in the Temple.

In Ant 20:250-251 (pp. 521 and 523 of Josephus\_9), Josephus wrote, “Now those who held the high priesthood from the times of Herod up to the day on which Titus captured and set fire to the temple and the city numbered twenty-eight in all, covering a period of one hundred and seven years. Of these some held office during the reigns of Herod and Archelaus his son. After the death of these [two] kings [Archelaus died in 6 CE], the constitution became an aristocracy, and ***the high priests were entrusted with the leadership of the nation.***”

In *Wars of the Jews*, published c. 79, Josephus makes no clear statement concerning

whether the Pharisees or Sadducees have control over one another. **In RL.pdf there is extensive historical evidence to show that in the first century before the year 66 when the war broke out, the priesthood had control of the Temple and the calendar.**

In contrast to this, in *Antiquities of the Jews* (published in 93/94), the court system greatly reduces the role of the priesthood, gives much place to the Levites in general, and also gives prominence to the judge whose lineage is not mentioned. When discussing the court system in his paraphrase of the Bible, which is sometimes distorted, he does not explicitly mention the words *Sadducee* and *Pharisee*. However, in *Antiquities of the Jews* there are several places in which he compares the Sadducees, the Pharisees, and the Essenes. In these places he claims that the Pharisees have more authority and power than the Sadducees, and from the viewpoint of authority he leaves the Essenes in the background. Note the following example.

In Ant 18:16-17 (pp. 13 and 15 of Josephus\_9), Josephus wrote, “The Sadducees hold that the soul perishes along with the body. They own no observance of any sort apart from the laws; in fact, they reckon it a virtue to dispute with the teachers of the path of wisdom that they pursue. There are but few men to whom this doctrine has been made known, but these are men of the highest standing. They accomplish practically nothing, however. For whenever they assume some office, though they submit willingly and perform, ***yet submit they do to the formulas of the Pharisees, since otherwise the masses would not tolerate them.***”

This section from Ant 18 in bold is a sharp contrast with the prior sections from AA 2 and Ant 20 in bold. The context of Ant 18:16-17 does not imply the existence of the Temple, but the other two contexts do imply its existence.

One way to reconcile this contradiction is to presume that in *Against Apion 2* and *Antiquities 20* he was referring to the time before 66 when the priesthood still functioned in a normal fashion, and in *Antiquities 18* he was referring to the time after 70 when the Sadducees lost its power base associated with the Temple because it no longer existed, it lost the tithe money because the Temple no longer existed, and it lost the recognition that was previously given to it by the Roman authorities. Thus all the grandeur was gone from the Sadducees. This approach has the advantage of obtaining an agreement with the New Testament. Ant 18 above contradicts the New Testament as seen during the early first century.

Notice John 12:42, “... because of the Pharisees they [the Jewish rulers] were not admitting, lest they should be put out of the synagogue.” This shows the sway of the Pharisees over the people in the synagogues. The Temple was not a synagogue.

On p. 445 of Deines, he gives the following careful translation of Josephus’s Life 12, “In the nineteenth year of my life I began to lead a public/political life, whereby I joined with the program of the Pharisees, which is comparable to that which the Greeks call

stoicism.” The sweep of the life of Josephus shows that he was a political opportunist, and in Life 12 he wrote that at the age of 19 he decided to follow the program of the Pharisees. It is reasonable to conjecture that he was not a fully recognized Pharisee because he did not personally comply with all the requirements necessary for that. Thus his wording is merely that he decided to follow its principles, not that he was a member. As a political opportunist, he would have recognized the essential long-term reality indicated in John 12:42, and thus knew that there was power in having the loyalty of the masses behind him as the Pharisees had, even if this power was limited in the environment of the Temple. It appears that Josephus preferred the political power from the people compared to the money and grandeur from the contributions.

On pp. 198-199 of Grabbe 2000 we see the following concerning Josephus’s remarks about Jewish leadership, “Those sources [in Josephus] which give the Pharisees a general dominance of a religious belief and practice are those which come later [date of writing by Josephus] in relation to parallel sources [*Antiquities of the Jews* compared to *Wars of the Jews*]. Thus, it is only two later passages in the *Antiquities* which state that public worship is carried out according to Pharisaic regulations and that the Sadducees are required to follow them even when they hold office. This is not stated in the *War* and is not borne out in Josephus's other passages on the Pharisees [in the first century].”

A flagrant distortion of Scripture in the writings of Josephus is his fabrication of the existence of a national decision-making body called a senate or Sanhedrin from the time of Moses and throughout the subsequent history of Israel. While it is true that in Num 11:16-17, 24-25, there was a selection of 70 elders to help act as judges, this is not described as one chamber or unified body meeting in one place. Only the plural word “elders” is mentioned, and from this time onward in the history of the Tanak there is silence about them as a group of 70 (or a different number), and silence about any central governing or judicial body as a counter balance to the king. Sometimes there is mention of the high priest showing significant authority. Josephus fabricates consultations of Joshua and of Israel’s kings with this Sanhedrin. He reads this institution from his own lifetime into prior Israelite history, thus rewriting history, fabricating it, yet claiming he is merely repeating what is in the Bible. Josephus is aware that certain Roman emperors such as Nero, acted as deranged tyrants and that bestowing all authority in one emperor for the Roman Empire without any legal check on his authority by a Roman senate was foolish. Josephus's insertion of a Sanhedrin into early Israelite history was his indirect method of criticizing the sole authority of the emperor in Roman society. This is a plausible rationale for his rewriting of Israelite history.

### (C) General Conclusions about Josephus

On p. 290 in the concluding chapter of his second book about Josephus, McLaren wrote the following:

“This study has focused on the implications of trying to make use of the gold-mine [the writings of Josephus], particularly in terms of the nature of the relationship between Josephus, his narrative of events, and contemporary scholarship, in the reconstruction of first-century CE Judaea. Scholars have increasingly voiced the need to display caution in the application of Josephus's narrative in an effort to understand the dynamic of the society. In fact, reference to Josephus without some introductory words of caution is now extremely rare. With Josephus we are dealing with a biased source. In itself, such a statement should not be a concern. Josephus has provided his own understanding of what happened and scholarship has labeled this his bias.”

“The gold-mine begins to take on the appearance of a minefield. The one and only substantial narrative of events pertaining to the first century CE is biased. If we are to establish a means of understanding the data it is of fundamental importance that we be able to distinguish between the bias and the narrative of actual events. Where the real problem lies is being able to stop before we become dependent on Josephus's interpretation.”

The following are my conclusions about Josephus, and these concern my overall view, not merely the view based on the above examples.

- (1) Josephus goes out of his way to exaggerate and boast about his own abilities in intelligence and knowledge of Jewish and biblical matters. He never claims to have any particular knowledge of mathematics or astronomy.
- (2) Josephus goes out of his way to exaggerate and boast about the accomplishments of the Jewish people throughout history.
- (3) Josephus portrays the actions of the Roman generals Vespasian and his son Titus in a manner that makes them appear more virtuous than reality. These men provided for the needs of Josephus, and he returns their favor.
- (4) The primary audience for the writings of Josephus is the nobility in Rome whose culture included the Greek language and famous Greek writers and themes. He is writing to them with their definitions of terms in his mind. Josephus is biased toward the thought process and appeal of this audience.
- (5) Near the beginning of his autobiography, which is called “Life”, Josephus wrote that before he was 20 years old he made the decision to follow the position of the Pharisees in his public life. Therefore, in Jewish doctrinal matters, we should expect Josephus to be biased toward the sectarian views of the Pharisees.
- (6) For matters that pertain to things that happened before the birth of Josephus, there were many writings that claimed to be historical in nature, concerning the Jews. Josephus picked whatever he wanted from these writings and used them for his purposes. Some of these are false, though Josephus has no way to know this.

(7) Josephus sometimes purposely distorts the biblical account for his own purposes. Therefore, one must be very cautious to accept what he writes as definitely true. He makes general statements that he will not distort anything, yet he boldly makes distortions, sometimes even contradicting himself as seen when comparing his writings from different years of publication.

Whenever there seems to be a desire to quote Josephus for some purpose, it is necessary to review the above list of biases in order to help to understand any possible way in which Josephus might be less than reliable. In the case of discussing I Samuel 20, it does not seem that the biases would affect what he had to say here. In the case of discussing the claim that Abraham taught the Egyptians mathematical astronomy, the biases of both (2) and (6) enter the picture. This claim appears to praise an important Jew, Abraham, as possessing knowledge that was highly respected among the nobility in Rome. Writings exist from before the birth of Josephus that claim Abraham taught the Egyptians astrology, but Josephus changed this to astronomy.

Scholars see no need to reject all of the writings of Josephus merely because there are biases in his writings. They seek to understand his biases so that they may evaluate where to accept and where to reject what he wrote. He is a mixed bag and must be read with caution and evaluation. There is no need to completely avoid him merely because some of what he wrote is not trustworthy. One may also scrutinize all of Philo's writings and find something objectionable, but that does not imply that Philo may not be used for anything historical.

#### [20] Josephus and his Aries Approximation

One passage from Josephus is referenced by some of the church historians between 200 and 600 CE (and no doubt references during the third century did not survive), and they claim it helps to determine when the first biblical month occurs. This passage is now our subject. Josephus made the following statement in his *Antiquities of the Jews* (Ant 3:248, also referenced Ant 3, 10, 5) as very literally translated on p. 302 of Feldman 2000, "In the month of Xanthicus, which among us is called Nisan and is the beginning of the year, on the fourteenth, according to the moon, the sun being in Aries, because in this month we were liberated from slavery under the Egyptians ..." This is typically simplified to the supposed rule that the 14th day of Nisan must be in Aries. Note that the word Xanthicus occurs in the passage.

Let us first consider whether any further clarification of Ant 3:248 might be attained by investigating the word Xanthicus. This word is the Greek (more accurately, Macedonian) name for a month. Ptolemy of Alexandria c. 150 C.E, wrote his *Almagest* in which he used Macedonian lunar month names. Ptolemy often gave credit for significant parts of his work to his Greek predecessor Hipparchus (c. 150 BCE), and we know that Hipparchus obtained many of his mathematical parameters used in astronomy from the

Babylonians. On p. 13 of Toomer 1984 he wrote, “The use of Macedonian month names [by Ptolemy] has rightly been taken to show that the Babylonian lunar months were simply called by the names of the Macedonian months by the Greeks under the Seleucid empire: if one computes the date of the first day of the ‘Macedonian’ month from the equivalent date in the era Nabonassar given by Ptolemy, it coincides (with an error of no more than one day) with the computed day of first visibility of the lunar crescent at Babylon. There is other evidence for the assimilation of the month names, but this is the strongest.” In a footnote on this page Toomer says that some of the Babylonian astronomical writings were translated into Greek using Macedonian month names perhaps as late as the time of Hipparchus, which was almost 200 years before Josephus was born. It is doubtful that the astronomical works of Hipparchus were available outside Alexandria where the advanced Greek astronomers lived, though Hipparchus spent much of his life on the island of Rhodes in the Mediterranean Sea some distance from off the coast of Alexandria. Hipparchus died about 150 years before Josephus was born. The astronomical works of Hipparchus were very difficult to comprehend and required an advanced education in astronomical terminology and mathematics to understand. It is difficult to imagine such an education outside Alexandria. Josephus momentarily visited Alexandria when he was traveling with Titus from Jerusalem to Rome after the destruction of Jerusalem in 70, but otherwise he does not hint that he was ever in Alexandria. He does not indicate any special ability in mathematics or astronomy. Ptolemy's mathematically advanced astronomical work was written c. 150 CE, long after Josephus died. We do not possess a plausible reason to think that Josephus would have been aware of this particular equivalence between the Babylonian month names and the Macedonian month names, yet it is possible. Since this equivalence in month names is documented by Ptolemy, this equivalence will be called the Ptolemaic equivalence below.

On pp. 142-143 of Samuel 1972, based on evidence from data on coins and a horoscope, he proposes a chart showing an equivalence from the Babylonian month names to the Macedonian month names. This chart is exactly one month displaced from the Ptolemaic equivalence mentioned above, so that they do not agree. Secondly, using another chart on those same pages based upon approximately two dozen examples of month name equivalents in Josephus, Samuel provides the equivalence from the Macedonian month names to the Jewish month names. By joining these two translation charts, Samuel proposes that Josephus was equating the Babylonian month name with the identical timing of the similar sounding Jewish month name, but *using Macedonian names instead of Babylonian names* for the sake of his Greek readers, primarily the nobles of the city of Rome who would be in the best position to read his work. Samuel's proposal would be incorrect if Josephus had the Ptolemaic equivalence in mind. Samuel's proposal is merely speculation because we do not know what Josephus knew, nor do we know his intent by his month name equivalents. Specifically, we do not know whether

Josephus was aware of the first chart mentioned above by Samuel. The greatest problem with this speculative theory by Samuel is that it contradicts the phrase of Ant 3:248 containing the word Aries, which is investigated next.

Aries had a clear known meaning in Rome where Josephus and his primary audience of Roman nobles lived. Discussing this theory proposed by Samuel, p. 138 of Hannah 2005 concludes that the overall evidence does not lead to any strong conviction for any precise meaning from Josephus's use of Xanthicus in Ant 3:248. I agree that there are too many unknowns concerning Josephus's use of Xanthicus to draw any worthwhile conclusion toward understanding Ant 3:248 based on the word Xanthicus.

The zodiac was discussed above, and the reader should be aware of the prior explanations now. Both Josephus and Pliny the Elder were given a tract of land in Rome on which to live at taxpayer expense. Pliny died in 79 and the two of them would have had opportunity to meet during the years 70 to 79. They were both well known figures among Roman nobility. Quotations from Pliny the Elder and two other Roman writers from his approximate time agree that **Aries began seven days before the vernal equinox**. In the first century it was only in the area near Alexandria that Aries was used in a manner that recognized its first day was on the vernal equinox. Josephus's primary audience was the Roman nobility who knew Greek and with whom he was able to socialize in Rome. That audience would expect Josephus to use the terminology expected in Rome and used by Pliny, who also socialized with the same nobility as Josephus.

On p. 120 of Varneda 1986, he comments on Ant 3:248 as follows, "... the sun is in Aries, which indicates the days half-way through March to half-way through April ...". This is correct. If we subtract seven days from the vernal equinox we are at the middle of March. Varneda's remark agrees with Pliny. In the first century, the vernal equinox fell on March 22-23 in the Julian calendar used in the Roman Empire, although the Romans may not have known these precise dates in their own calendar. They would have known the approximate date of the vernal equinox.

Ant 3:248 is saying that the 14th day of Nisan must fall between mid-March and mid-April. This means that Nisan 1 must fall anywhere in March, so that it may fall as early as about three weeks before the vernal equinox. This approximate rule does not neatly fit with any astronomical principle. It ties Nisan 1 into the Julian month of March. It cannot be biblically correct because it occurs at an astronomically awkward time that would be difficult to judge unless you simply determine whether the new moon occurs in the (astronomically artificial) Julian month of March. Since the Julian year is exactly 365.25 days, it is a little longer than a true solar (tropical) year, and thus the vernal equinox would gradually drift in the Julian calendar.

Ant 3:248 uses the well known concept of the sign of Aries (not the actual constellation)

to approximate the Jewish first month at that time. This approximate rule is astronomically awkward and cannot be biblically correct. Yet it is astronomical in concept rather than agricultural.

[21] Destruction of the Temple and Nisan 1 moves into the Winter

The priesthood controlled the Temple in the first century before the war broke out in 66 (RL.pdf shows this). Num 10:10 shows a responsibility of the Levitical priesthood in declaring the “beginning of the months”, and Num 28 and 29 show the responsibility of the priesthood to perform sacrifices on the new moons and on the festivals. Ps 133 shows the authority of the Aaronic priesthood for the spiritual unity of the people. This evidence makes it clear that the priesthood controlled the calendar in the first century before the war broke out in 66.

The Jews began a war with the Romans in the year 66 and they were defeated in 70 when Jerusalem’s walls were broken, the city was burned, and the Temple was burned and destroyed. Early in the war the Jews captured the southeastern fortress known as Masada at the top of a high plateau, and due to its natural protective position, the Jews defended this until 73 when the Romans constructed a tall scaffold and scaled its walls, and the Jews who were isolated there committed suicide.

The four most significant results of this devastating war were: (1) The anti-Jewish sentiment in the Roman Empire; (2) The destruction of the Temple, which was the Second Temple (the first Temple was Solomon’s Temple); (3) The disappearance of the Aaronic priesthood from known history not very long afterward; and (4) The opportunity for the victors of the political struggle between the Pharisees and the Sadducean priests to determine the general direction of *written* Judaism in later times.

The destruction of the Temple had significant consequences for Judaism. The Temple was much more than a physical structure. It was the symbol of the world headquarters of Judaism where Messianic rule was to occur. Pious Jews from many lands sent contributions there for the upkeep of the Temple and they sent tithe money to the Aaronic priesthood. Many Jews traveled there three times each year for the festivals. When the Temple was destroyed, this physical symbol and the associated mental concept of Judaism were removed. It is to be expected that mental depression among many Jews continued for years, and they no longer had one primary place to visit for the festivals.

The Roman leaders did not want the Temple to be rebuilt because in their eyes the zealous fanatical masses of Jews began the war from that focal point, the Jewish headquarters of Jerusalem. The loss of the Temple was a punishment, although the Jews maintained a hope that the Temple would be rebuilt just as the Second Temple replaced Solomon’s Temple. The Romans no longer wanted to officially recognize any central body of Jews that represented the Jewish population, such as a Sanhedrin. In fact, since the Aaronic priesthood did not prevent the war, the Romans had a negative attitude

toward the priesthood, and they no longer officially recognized it as having authority in relation to the Roman governor and the other Jews in Judea. This meant that the only support the priesthood could receive needed to come from the Jews, not the Romans.

Before the war, the Roman government worked with the priesthood and recognized the priesthood. The priesthood had jurisdiction over the physical things of the Temple, and the Romans recognized this. The New Testament shows the Roman governor Pilate conversing with the chief priests (Luke 23:13). Pilate recognized their position of authority concerning the Jews, especially in the Sanhedrin and particularly the high priest. After the war, the Romans turned their back to the priesthood and gave it no recognition. This was only one of several heavy blows to the priesthood after the war.

The Temple at which they performed their rituals was gone, and although it was technically possible for them to imagine to perform rituals without a Temple as was done before Solomon's Temple was built, that would require money for their support such as tithe money, and it would require a Jewish audience that had a desire to watch them perform without the presence of the Temple. Note the reality seen from John 12:42, "... because of the Pharisees they [the Jewish rulers] were not admitting, lest they [the rulers] should be put out of the synagogue [by the Pharisees]." This shows that the Pharisees had much control over the people in the synagogues of Judea. The synagogues were away from the Temple, but now there was no Temple. It is obvious that the priesthood would need the active support and cooperation from the Pharisees if they were to continue to perform their priestly rituals. That support would have to include the desire of the Pharisees to urge the people to send monetary contributions to the priesthood and to attend functions of the priesthood.

The authority of the priesthood came from the Bible (the commanded function and respect indicated in Num 10:10; Deut 33:10; Num 28-29; Ps 133; etc.), partly from their genealogy, partly because of the desire of the Jews to watch them perform their duties, and partly from recognition by the Roman authorities. Any Pharisee who did not have the proper genealogy from Levi, and more specifically from Aaron, could not be a priest, and thus there was a barrier of lineage between most Pharisees and the priests. If the Pharisees were to encourage the people to give support to the priesthood, it would detract from their own authority.

Concerning the Sadducees, note Acts 5:17 [NKJV], "Then the high priest rose up, and all those who [were] with him (which is the sect of the Sadducees), and they were filled with indignation." This shows the chief priests to be included within the Sadducees at that time, although it is unclear how many Sadducees might be from outside the priesthood. Acts 26 shows that there was doctrinal antagonism between the Pharisees and the Sadducees (largely the priestly party), which led to a physical tumult. Many places in the writings of Josephus show that there was political antagonism between the

Pharisees and the Sadducees. This friction was due to the permanent gulf of genealogy, doctrinal differences in both details and overall approach, their different relationships with the Jews of the land (the ordinary people), and their separate association of friendships. In the Temple environment and with the Roman governor the Pharisees did not have the authority that they enjoyed in the synagogues. From this it should be clear that the Pharisees could not be expected to support the priesthood in the sense of urging the people to send them contributions and going to watch them perform their rituals after the Temple was destroyed. The loss of the priesthood from history is the clear evidence that the Pharisees let the priesthood vanish.

In Acts 15 and Gal 1:19; 2:9 James is mentioned. The death of this man James is described by Josephus in Ant 20:197-203. P. 32 of the article by Smallwood 1962 states that the high priest Ananus mentioned in this episode had James killed in 62 CE, only four years before the war broke out. This episode is an instructive example that shows who had authority. On pp. 495, 497 in Josephus\_9, we see in Ant 20:199-203, “He [Ananus the high priest] followed the school of the Sadducees, who are indeed more heartless than any of the other Jews, as I have already explained, when they sit in judgment. Possessed of such a character, Ananus thought that he had a favourable opportunity because Festus was dead and Albinus was still on the way. And so he convened the judges of the Sanhedrin and brought before them a man named James ... [he was stoned] ... Those of the inhabitants of the city who were considered the most fair-minded and who were strict in observance of the law were offended at this. They therefore secretly sent to King Agrippa urging him, for Ananus had not even been correct in his first step, to order him to desist from any further actions. Certain of them even went to meet Albinus, who was on his way from Alexandria, and informed him that Ananus had no authority to convene the Sanhedrin without his consent ... King Agrippa ... deposed him from the high priesthood ...”

On p. 26 Smallwood makes the following comment on this, “In doing so he [Ananus] acted *ultra vires*, and thus alarmed some of the more moderate Jews and ‘men learned in the law’ (i. e., the Pharisees) so much that they sent secretly to Agrippa ...” The point here is that the Pharisees were not able to prevent the death of James by the Sadducean high priest who was able to convene a Sanhedrin. It does show that while the Temple stood the Sadducees did have authority that the Pharisees could not overturn by themselves. It does cause me to believe that the passage quoted in a previous chapter in bold in Ant 18 describes the situation after the destruction of the Temple rather than before 66. Otherwise it would contradict the New Testament and the example of Ananus from Josephus.

In 93/94 when Josephus completed his *Antiquities*, it was about 23 years after the Temple was destroyed. This was sufficient time for the Aaronic priesthood to crumble due to lack of funds and lack of backing by the Pharisees. In Ant 18 as quoted

previously, we saw, “*yet submit they [Sadducees] do to the formulas of the Pharisees, since otherwise the masses would not tolerate them*”. In light of the New Testament this can only make sense after the Temple was destroyed.

Just as Josephus mentions the recent (near 93/94) domination of the Pharisees over the Sadducees without stating that it is recent, he also mentions the Aries approximation for the first Jewish month without stating that it is recent!!

Before the Temple was destroyed in 70, Philo gave his view that the start of the first Jewish month should not come before the vernal equinox. After the Temple was destroyed, Josephus's approximation using Aries allows the first Jewish month to begin about three weeks before the vernal equinox. This provides indirect evidence that the Pharisees altered the calendar after the Temple was destroyed and the Sadducees were deprived of their authority.

The method to determine the first month according to the earliest rabbinic literature, the Tosefta c. 250, is described in subjective terms with differences of opinion, thus leaving the reader with uncertainty and confusion. From the simplicity before the destruction of the Temple as implied by the astronomy in Gen 1:14, we find the sharply contrasting later ambiguity and the need for subjective judgments in rabbinic literature c. 250. These later rabbinic elusive principles involve weighing a combination of independent factors such as the state of the barley and the time of the vernal equinox (differing opinions here). The location of the barley within Israel is also relevant in the rabbinic sources. One would have to conclude that knowledge of when the first month should occur became lost sometime after 70 when the Aaronic priesthood vanished from history.

The Aries approximation by Josephus is not so much a black mark against Josephus as it is a black mark against changing calendric practice by the Pharisees in their struggle with the Sadducees. Josephus is merely reporting to the Roman nobles on the practice of when the first Jewish month has been falling in recent years among mainstream Jews, especially those in the synagogues in Rome. It is an assumption that certain leading synagogues in Judea set the example for other synagogues to follow. History has gaps here.

The logical explanation is that after the Temple was destroyed, there was a doctrinal difference over the method to determine when the first month should begin. This difference would be between the leaders of the priests and the non-priestly leaders who had authority among Jews, i. e., the Pharisees. It is reasonable to think that there was a power struggle between the priests and the non-priestly Jewish sages, and the calendar became an issue in this struggle. The method to properly determine the timing of the first month was lost within subsequent Jewish writings. No doubt this happened soon after the Temple was destroyed when a struggle for authority would be natural. No written records describe it. Eventually the news filtered down to Josephus in Rome

where he lived. From synagogues in Rome, Josephus had to notice that the first Jewish month was no longer falling where it had been falling before the Temple was destroyed. If the primary audience of Josephus, the Roman nobles who prized the Greek language, wanted to know when the first month of the Jewish calendar fell, what would Josephus tell them? Would he tell them of a recent power struggle among Jews and a change in the placement of the first month? Certainly not! The Jews would not want to inform Josephus of their internal problems because they considered him to be a traitor due to his role in the war after he surrendered. Josephus would want to supply his readers with an approximation to the current practice of the Jews, not what had been the practice before the Temple was destroyed.

Josephus was a very practical person subject to biases as a politician, certainly not an idealist in truth. Josephus is not a good source for knowing when the first month fell before the Temple was destroyed because he wrote after it was destroyed and after the leadership of the greater mass of Jews in greater Judea changed.

**The Aries approximation by Josephus was a poisoned pill of deception for the future of calendar study by the early church fathers who preserved the writings of Josephus. Another problem for the early church fathers was the ambiguity of the sign of Aries, whether it referred to Pliny's description known by Josephus, or that of the astronomers in Alexandria. Subsequent history shows that the early church fathers made a mistake in the meaning of Aries by Josephus because in later times the Alexandrian meaning of Aries became more accepted in the Roman Empire and also because the Bishop of Alexandria took on a major role in the computation of the first month for many churches beginning c. 230.**

[22] Cessation of the Babylonian Calendar shortly after 75

This is an appropriate moment to discuss the cessation of the Babylonian calendar and the loss of its knowledge by people in Alexandria and the rest of the Roman Empire after the first century. When Philo mentioned the first month of the Jewish calendar in the first century (see the last chapter), he mentioned its similarity to the lunar calendar used by other nations, which was a non-specific allusion to the Babylonian calendar that was still in use in his own day, although not in Egypt.

The Babylonian calendar in the first century was under the control of the Babylonian priestly hierarchy in the city of Uruk. The city of Babylon had been destroyed.

The Babylonian cuneiform tablets show that the year 75 in the first century was the last year in which the Babylonian astronomer-astrologers determined and published the days upon which each lunar month began in their calendar. The Roman army had taken control of the territory in the east up to the Euphrates River, but no further. The two cities in which the Babylonian astronomer-astrologers had been active in their development of the science of astronomy were Babylon and Uruk, both on the bank of

the Euphrates River, with Uruk further south. By some time during the first century, the battles associated with political and territorial control between the Romans in the west and the Parthians in the east had left the city of Babylon devastated and the pagan temple in which the Babylonian astronomers worked, a pile of ruins. Only Uruk remained as a center for the continuation of Babylonian astronomical science and calendric production.

A major factor of great significance for the cessation of the Babylonian calendar along with the cessation of their practice of mathematical astronomy is the fact that the chief source of income for the Babylonian priests was being paid for their horoscopes and astrology in general. After Alexander the Great required the Babylonian astronomer-astrologers to reveal their secret knowledge to the learned Greeks, those Greeks began to compete with the Babylonians for income from the practice of horoscopes and astrology in general. The Greeks charged a lower price for that practice, and this drove the Babylonians out of the business. Hence the major source of income that supported Babylonian astronomy and its calendar dwindled away.

In 46 BCE Julius Caesar first promoted a new solar calendar named the Julian calendar after him. This was the official calendar of the Roman Empire. Although other calendars were not suppressed by the Romans, neither were other calendars supported by funds from the Roman government. The pagan temple in Uruk lost its income from astrology and from government funding. All Babylonian science had been restricted to the privacy of writing in the ancient Akkadian language which had become a dead language (except for pagan astronomers and a some other highly educated Babylonians) since about the ninth century BCE when Aramaic became the universal language of the east. It is possible that there were some pockets of use of the Akkadian language among laymen in the east after c. 600 BCE, but this is not historically demonstrable.

The Babylonian calendar became obsolete after 75. Its knowledge became hidden with the unknown Akkadian language, and the Babylonian cuneiform tablets were unknown outside of its native territory. Greek astronomers who wrote in Alexandria substituted Macedonian (Greek) lunar month names for the original Babylonian month names. Roman nobles who studied the Greek language knew the Macedonian month names rather than the Babylonian month names. The Greek language instructors of Josephus in Rome taught him the Macedonian month names which he often used in his writings.

Therefore, Christians in Alexandria had no ability to understand the calendric significance of the Babylonian month names that are found in the Septuagint translation of the Tanak. Hence it became possible for Philo's writings on the Jewish calendar to become misunderstood by those who came after him. They knew from Philo that the vernal equinox was associated with the first month and that the calendar was based upon the sun and the moon. But specific details became lost with the extinction of the

Babylonian calendar in 75 and the abandonment of the Aaronic priesthood shortly after the Temple was destroyed in 70. These two losses at about the same time paved the way for later confusion on the calendar. Josephus became a source of confusion because he introduced the sign of Aries about 23 years after the Temple was destroyed and at that time the Jewish calendar was no longer under the control of the Aaronic priesthood.

[23] Hippolytus Promotes Abandoning the Jewish Calendar c. 222

Hippolytus (c. 170 – c. 236) was a church priest who lived in or near the city of Rome. He wrote many commentaries on Scripture in Greek and had a reputation as a skilled preacher. On p. 26 of Cummings 2005 we read, “The great Origen of Alexandria heard Hippolytus preach in Rome about 212.” Origen would have been about age 27 at this time.

On p. 69 of Eusebius (EH 6:22), we read, “At that very time also Hippolytus, besides very many other memoirs, composed the treatise *On the Pascha*, in which he sets forth a register of the times and puts forward a certain canon of a sixteen-years cycle for the Pascha, using the first year of the Emperor Alexander as a terminus in measuring his dates.” Emperor Alexander Severus reigned from 222 to 235, so the first year of the Pascha table of Hippolytus was 222. The Pascha table itself, for 112 years, is preserved carved in the base of a statue that dates from the third century. The dates on this statue for the celebration of the Pascha by the church all fall on a Sunday.

On p. 63 of Brent 1995, he wrote that the statue bears an inscription that “... dates the crucifixion [of the Nazarene] on the 25th March (14th Nisan), 29 A.D. ...”. On p. 86 of Goldstine 1973, he shows that on March 4, 29 at 1:13 UT the astronomical new moon occurred. The next sunset in Jerusalem on this date would have been about 14.5 hours later, which is not sufficient time to see the new crescent. This is a general statement rather than the more precise use of Schoch's curve. Using the computer program LoadStar Professional, with coordinates of longitude 35 degrees 13 minutes east and latitude 31 degrees 47 minutes north for Jerusalem, and using the time 15:40 UT for sunset in Jerusalem (the program provides this time for sunset on this date), the result shows that the sun's azimuth is 262 degrees 19 minutes 35 seconds and the moon's azimuth is 256 degrees 21 minutes 28 seconds. Hence the azimuth difference between the sun and the moon is close to 6 degrees. According to Schoch's curve this requires an altitude for the moon of 9.8 degrees as the ideal borderline for visibility. In practice, with good weather conditions and visibility, one might see the new crescent up to half a degree less than this. But according to the computer program, at sunset the moon's altitude was 4 degrees 38 minutes 21 seconds. This is much too far below 9.8 degrees to hope for visibility. One day later on March 5 at sunset, the moon's altitude was 15 degrees 27 minutes 45 seconds, which is very easy to see. Hence, the moon should easily have been seen on the evening prior to Saturday March 6. This would make

March 6 the first day of the month.

Therefore, based on the sighting of the new crescent from Israel, Friday March 19 in the year 29 would have been the 14th day of the lunar month. The statue claims the date was March 25. Since the crucifixion would have been on the 14th day of the lunar month (March 19), this would make the date for the crucifixion according to the inscription impossible, and hence this would have to be dismissed as a false legend. It happens that the vernal equinox in the year 29 fell on Julian March 22, 16:48 according to the computer program BRESIM. On the same page Brent states, “We should further note the acceptance by the Hippolytan community of the Johannine dating of the last supper [Nisan 14].”

On p. 67 Brent wrote that for the year 222, which is the first year of the Pascha Table of Hippolytus, “the 14th Nisan falls on the Ides April (13th) which is a Saturday”. According to p. 35 of Pedersen 1983, Hippolytus made every year that consisted of 12 months have exactly 354 days. The same three years in every eight had a 13th month in this table. This scheme makes eight years have 99 months. On p. 32 Pedersen comments, “The eight years will have elapsed one day and a half before the moon has passed through 99 complete revolutions with the result that the expected Easter moon after eight years would be delayed by 1 ½ days.”

How did Hippolytus decide when to add a 13th month? Pedersen discusses this question on p. 37, writing, “It is clear that this had nothing to do with the vernal equinox which, according to the Roman calendar, was March 25, for there are Easter moons [= 14th of the computed first month according to Hippolytus] as early as March 18 in both the 6th and the 14th year of the cycle. Now March 18 was the day on which the sun entered the sign of Aries according to the Romans [in the first century Pliny the Elder wrote that the vernal equinox fell on the eighth day of the sign of Aries and that the vernal equinox fell on March 25], and it may well be that Hippolytus took this as the *terminus a quo* [= earliest date] for the Easter moon [= 14th day] in order to place his own NISAN in the spring as ordained in Holy Scripture [as Hippolytus saw it].”

**The above analysis by Olaf Pedersen concerning the writings of Hippolytus is precisely according to a forced strict view of Josephus as already discussed above, and according to the arrangement of Pliny the Elder using the vernal equinox on the eighth day of the sign of Aries!! This is really exciting because it shows a dependence of Hippolytus upon Josephus as seen from the Roman first century viewpoint, not according to the Alexandrian concept of the sign of Aries, which began with the vernal equinox.** Hippolytus's treatise *On the Pascha* has not been preserved, so we cannot quote his own explanation. However, we have the Julian calendar dates preserved on the statue.

It seems obvious that Hippolytus in Rome promoted the use of Josephus to determine

the allegedly correct time for the first month based on the Roman concept of the day of the vernal equinox on March 25 and the use of Pliny that would cause the sign of Aries to be on March 18. Hippolytus was using Pliny along with Josephus for the sign of Aries, but he did also use the false Roman March 25 for the vernal equinox as the anchor for knowing the start of the sign of Aries. Hence Hippolytus was not actually using the vernal equinox, but instead the sign of Aries, according to the words of Josephus. Josephus did not mention the vernal equinox at all, but instead he mentioned the sign of Aries.

Thus Hippolytus promoted abandoning the Jewish calendar for the church in his own century. At least from the time of Hippolytus onward, Josephus would have been an object of focus for the early church fathers concerning when to celebrate a Sunday Pascha, or Easter. Since Eusebius demonstrates an interest in tracing the history of efforts of the church leaders to determine the original calendar of the Scriptures, he apparently is not aware of efforts before Hippolytus. There is no reason to think that Hippolytus knew that in Alexandria the sign of Aries began on the day of the vernal equinox in contrast to the use of March 18 in Rome following Pliny the Elder. While the first year in the table of Hippolytus is 222, we cannot be sure that he wrote his essay *On the Pascha* in that year.

By the year 230 the Alexandrian Church began dispatching letters with the date of Easter to be kept by other churches, according to Eusebius as quoted by Pedersen above. Although Hippolytus lived in the environs of Rome where Latin was the vernacular language, he wrote his biblical commentaries in Greek. It is plausible that his essay *On the Pascha* reached the Greek speaking Alexandrians, and thereby Josephus's comment on Aries gained their attention. To educated people in Alexandria at that time, Aries began with the vernal equinox. Thus, such educated people would have thought that Josephus began Aries as they themselves did. Perhaps they were not aware of the writings of Pliny the Elder in Latin, which expressed a contrary view as explained above.

The writings of Philo of Alexandria were available to Origen who quoted from Philo in many of his own writings. Philo would also have been read by other Christians in Alexandria, and Philo placed emphasis on the vernal equinox.

[24] Origen and the Jewish Calendar

(A) The Importance of Origen for the History of the Calendar

Origen made a few statements concerning the calendar practiced by the Jews in his day. The time and geographical place of his life in relation to learned Jews and Jewish history are especially significant for his witness to the calendar. **At least as significant as this, is the fact that within 25 years after Origen's death Anatolius used Origen as a witness to support the view promoted by Anatolius, and this is critical for judging**

**the reliability of Anatolius.** With so much importance attached to Origen, it is worthwhile summarizing key aspects of his life.

#### (B) Sketch of Origen's Life and Environment

Origen was born in Alexandria c. 185 (Crouzel, p. 2). His father gave him both a Christian and a Hellenistic education. He became a teacher of Christianity in Alexandria having the primary goal of bringing people to accept Christianity. Friction developed between him and Bishop Demetrius of Alexandria because the latter exerted much control in both the organization of the Alexandrian Church and in doctrinal matters. The latter interfered with Origen's ability to write commentaries, so he moved to Caesarea on the eastern coast of the Mediterranean Sea in 233. One year before this move he was ordained as a presbyter while visiting Jerusalem, and no doubt Demetrius was angered by this because he was not consulted. In Caesarea he was a teacher, a preacher, the director of his library, and he continued writing commentaries on books of the Bible as he had done in Alexandria. He was supported by the wealthy layman patron Ambrose, who also provided him with secretaries and stenographers for writing down his biblical commentaries and other documents that he dictated. He died in 253 or 254.

Origen was the most prolific Christian writer in ancient times and his views played a significant role in subsequent mainstream Christian theology. On the other hand, some of his conclusions were based upon loose spiritual analogies and Hellenistic philosophy, and this made him a very controversial figure among mainstream Christian leaders about 130 years after his death. He was not autocratic and was dismayed by autocratic behavior in other Christian leaders. His personal library was a major addition to the theological library that had begun in Caesarea. After his death this library continued to expand, and perhaps c. 275 one source estimated this library to have 30,000 volumes (McGuckin 1992, p. 21). With the financial help of his layman patron Ambrose, he was able to acquire any theological writing he wished. His biblical commentaries earned him great fame in his lifetime. His primary interests were in promoting growth in the churches and in promoting his doctrinal positions in theology through reasoning rather than through politics or coercion. To further his cause, he had a reputation to uphold for accuracy and thoroughness. When he disagreed with the views of others of recognized rank, he never mentioned those people by name or by other indirect means. He simply explained his own views and left it to others to notice how his views may differ with others.

Origen had no time for church politics and tried to avoid rivalries with others by stating his own views without mentioning the names of others with whom he disagreed. He would have become familiar with the dates for the declaration of Easter before he departed for Caesarea in 233. According to Origen's habit of avoiding rivalries and personal disputes, he was very low key in how he stated his conclusions.

Origen directed the huge written project known as the Hexapla, a work of the Old Testament in six columns. The columns were the Hebrew text (= the Tanak), its transliteration into Greek, Aquila's translation, Theodotion's translation, the Septuagint, and Symmachus's translation. In order to engage in discussions with Jewish theologians concerning certain matters pertaining to the Hebrew Scriptures, Origen needed an accurate understanding of the Hebrew Scriptures. For this purpose the Hexapla was a great help to Origen. The Hexapla also served the important purpose of helping Origen to judge validity among the various versions of the Septuagint (= LXX). If Origen could not decide among versions of the LXX in some part of the text, he sometimes favored a version that agreed with the Three (= Aquila, Theodotion, and Symmachus). He recognized that it was important to know what writings were authoritative, that is, canonical as inspired.

Except for occasional travels, he lived in Caesarea for about the last 21 years of his life. Caesarea had the best shipping port of all the cities on the eastern (north-south) edge of the Mediterranean Sea, and it may have had a population of 100,000 in Origen's time (McGuckin 1992, p. 11). Its population was a mix of Jews, Christians, pagans, and Samaritans who often worked in close proximity. Thus some individuals among these diverse groups developed the ability to share their religious background in conversation.

The scanty yet significant statements from Origen about the Jewish practice for the time of the first month do corroborate the Tosefta in the general sense of timing.

### (C) Origen's Relationship with Learned Jews

Pp. 88-89 of Levine 1975 reveal that there was a well-known academy of rabbinic studies in Caesarea. Some sources discuss this as a group of schools, each conducted by one learned rabbi. The origin of this academy or group of schools is roughly c. 200. Students to this academy even came from Babylon, and it was likely the leading academy for rabbinic studies in the world during the third century. On p. 95 Levine wrote, "The 'Rabbis of Caesarea' are mentioned some 140 times in the Palestinian Talmud [= PT] both transmitting the opinion of others and expressing their own views." The PT was published c. 400 although it was several decades in the making. There was always diversity in how Jews interpreted the Tanak, yet Caesarea was a leading site for the promotion of Orthodox (= rabbinic) Judaism because of the rabbinic academy there.

A little to the east of Caesarea were the two cities of Tiberias and Sepphoris, the leading cities in this era with a few rabbis of reputedly greater stature than those in Caesarea during the third and fourth centuries. Since Caesarea was more cosmopolitan than the other two cities, the Roman capital of its province, a Roman military base, and a major port city, this made the Jews of this city quite open to non-Jews, and it was very likely the best location in the world for a Christian scholar such as Origen to engage in discussions with highly esteemed rabbis who knew the Tanak and Jewish practice.

Origen composed the work *Contra Celsum* c. 247 (pp. xiv-xv in Chadwick 1980). On p. 41 of Chadwick, in CC 1:45, we read from Origen, “I remember that once in a discussion with some Jews, who were alleged to be wise, when many people were present to judge what was said, I used the following argument.” On p. 50, in CC 1:55, we read from Origen, “I remember that once in a discussion with some who the Jews regard as learned I used these prophecies.” On p. 93, in CC 2:31, we read, “But although I have met with many Jews who were alleged to be wise ...”

Many references such as these were collected by de Lange in his book (1976) *Origen and the Jews*. On p. 22 of this book de Lange wrote, “Origen will thus have had no more difficulty, given his relations with Jewish scholars, in gaining access to the traditions and writings of the rabbis [in Hebrew] than if they had been written in Greek, no more difficulty, that is to say, than any Greek-speaking Jew. We should suppose that he learned something of the character of the [Hebrew] language, and some vocabulary, from his frequent inquiries and discussions, but it is by no means inconceivable that he relied entirely for his knowledge of Hebrew texts on his Jewish colleagues.” Later on the page he wrote, “We shall not be far from the truth if we conclude that Origen could not speak or read Hebrew, but that he was fortunate in having acquaintances who did, and who gave him such help as he demanded.”

On p. 225 of de Lange 1975 he wrote, “That Origen took a deep and serious interest in the Jews is apparent from even a casual perusal of his works. He says that in expounding a difficult passage of scripture the Churchman will first enquire of the Hebrew tradition, and he provides several explicit examples of his own enquiries on specific questions.” On p. 235 he wrote, “This implies that he did not merely turn to the Jews when he was in difficulties, but spent a good deal of time merely discussing the Bible with Jews or even perhaps attending rabbinic discourses on scriptural texts.”

#### (D) Motivation and Resources for Origen on the Jewish Calendar

On p. 80 of Chadwick 1980, Origen wrote in CC 2:13, “The siege [against Jerusalem] began when Nero was still emperor, and continued until the rule of Vespasian. His son, Titus, captured Jerusalem, so Josephus says...” From this there is no reason to doubt that the works of Josephus were in Origen's library and he was somewhat familiar with his writings.

On p. 117 of Runia 1995 he wrote, “It can be said beyond all reasonable doubt that the preservation of Philo's writings as we have them today is due to the intervention of Origen himself. Had he not taken copies of Philo's treatises with him when he moved from Alexandria to Caesarea in 233, then these would have been lost, together with the remainder of the Hellenistic-Jewish literature of Alexandria.” On p. 118 Runia wrote, “The best list, oddly enough, is probably to be found in Cohn and Wendland's text of Philo, which in the apparatus criticus lists some 99 cross-references to Origen.” Origen

learned the concept of spiritual interpretation from Philo's allegories.

Long after Origen died, the Church historian Eusebius directed the same library in its expansion, and Eusebius quoted from parts of the writings of Aristobulus. Since Aristobulus was from Alexandria and his writings originated there, and since Origen took such writings with him when he left that city, it is certain Origen already had the writings of Aristobulus in his library.

Hence Origen had the writings of Philo, Aristobulus, and Josephus concerning the Jewish calendar. He also had the opinion of Jewish scholars in Caesarea who would most likely have presented him with the opinions found in the Mishnah and Tosefta of the rabbinic Jews. The latter documents show conflicting opinions with no consistent conclusion on the calendar (discussed below). Since Origen's library was kept current with contemporary commentaries on Scripture and related subjects, it is plausible that Origen had the opinions of Hippolytus on the calendar and was in fact under some pressure to give his own opinion on the time of the year for the first month. Certainly Origen was familiar with the practice of the Alexandrian Church dispatching letters for the date of Easter from before he moved away from Alexandria.

(E) When were the Jews Keeping Passover in the time of Origen?

When Origen completed his commentary to the Gospel of John while living in Caesarea, perhaps during the 240's, he briefly wrote about the time that the Jews of his day were keeping the Passover. In Heine's translation 1989 on p. 280, section 116 states, "It will be easier, however, in other places to view the statements which are made about the time of the pasch, which takes place around the spring equinox, and whether any other problem demands investigation." This is an isolated statement.

Since Origen regards this matter of the time of the first month to be of significance to the Church in his own day, even though his comment is brief, his choice of words would not be more vague than necessary. It indicates that in his own day in Caesarea, sometimes the Jewish passover occurs before the vernal equinox and sometimes afterward. Compare this with what he indicates in the next section.

(F) Origen's Treatise on the Passover

In Origen's Treatise on the Passover (written c. 245 according to the chronological research by Robert Daly; see p. 4), he quotes all or parts of Ex 12:1-2 at least nine times! This shows a major interest in this calendric question, and his audience would certainly have their nerves on edge to know what he thought. The Septuagint that was used by him in this passage was very close to the Hebrew.

Ex 12:1-2, "And YHWH said to Moses and to Aaron in [the] land of Egypt, saying 'This month [shall be] to you [the] beginning of months, it [shall be the] first of [the] months of the year to you.'"

Notice that the words “to you” (to Moses and to Aaron) occur twice in the Hebrew, just as they occur twice in the Septuagint that Origen used and quoted.

On p. 30, concerning Ex 12:1-3, Origen wrote, “If he had added: 'Speak to the whole assembly of the sons of Israel and say: This month is for you the beginning of months,' he would have been saying this without distinction both to Moses and Aaron and the whole people.” Origen is saying that Moses and Aaron knew when the first month should fall, but they were not commanded to tell the whole assembly when the first month should fall!!

From this statement on the calendar Origen simply concluded that the original details of the Scriptural calendar were intended to be kept a secret, told to Moses and Aaron at the contextual time of Ex 12:2, but not revealed in Scripture to the people!! At the bottom of p. 29 Origen wrote that Ex 12:2 was **not** spoken “... to the whole people, but only to Moses and Aaron.” On p. 30, after quoting Ex 12:1-2, Origen wrote, “... it is clear that it is not for the whole people that that month was then *the beginning of months*, but only for Moses and Aaron to whom it was spoken.” In other words, according to Origen's interpretation of this, Moses and Aaron were told when the first month occurred, but they were to keep the method a secret from the people. Thus Origen was admitting that he did not know when the biblical first month should occur, and he did not think that the Jews knew either because they could not give him a clear single answer.

The Tosefta was being composed by rabbinic scholars during the first part of the third century when Origen was active. Its date of publication is a matter of scholarly debate, placing it sometime in the third century, perhaps c. 250. But the leading Jews of Caesarea would have spoken to one another about the issues involved and known its conclusions on the matter before it was published. Multiple contradictory views on the time of the first month are in the Tosefta.

In Tosefta Sanhedrin 2:7, the section below from p. 198 of Tosefta-Neusner\_4 shows contradictory views concerning the use of the vernal equinox. The phrase “intercalate the year” refers to adding a thirteenth month. The point of distance in time is the new moon of the candidate first month. Square brackets are added by the translator Neusner.

“A. They intercalate the year only if the spring equinox is distant by the better part of a month.

B. And how much is the better part of a month? Sixteen days.

C. R. Judah says, 'Two thirds of a month, twenty days.'

D. R. Yose says, 'They make a reckoning of the year. If before Passover there still are lacking sixteen days of the equinox, they intercalate another month. [If there are lacking] sixteen days before the autumnal equinox, they do not intercalate it.'

E. R. Simon says, 'Even if it was lacking sixteen days before the Festival [of Sukkot],

they do intercalate it.”

From the above we note two kinds of disagreements. One involves a rule concerning whether 16 or 20 days to the vernal equinox should be used. Another involves whether consideration of advance calculation for the autumnal equinox should also be used. Moses and Aaron could not have received such confusion at Ex 12:1-2. Surely the Aaronic priesthood could not have had such confusion before the Temple was destroyed. Origen's library containing Philo, Josephus, and other sources were not helpful for him to establish a condition for knowing when the first month occurs. He would not have understood the Babylonian calendar in relation to Philo's important remark. We do not know whether Origen understood the distinction between Aries in Rome where Josephus wrote compared to Aries in Alexandria. We do know that Origen was admitting that he had no answer nor did he think a definitive answer was available.

In Tosefta Sanhedrin 2:2, 2:3, and 2:4 on p. 197 other considerations that contribute to a decision to intercalate the year are given. These involve the state of the growth of the grain, the fruit of the trees, and the growth of domestic animals of kids, lambs, or pigeons. Taking all such matters into consideration including the equinoxes certainly involves subjective judgments, and does not produce a clear result to which others can easily agree.

In sharp contrast to this, Anatolius claims that Origen agreed with his own conclusions on the calendar!! This makes Anatolius untrustworthy because he misrepresented Origen's views.

Anatolius used Origen's library in Caesarea after the latter's death (in 253/254) in his effort to write about the determination of the first month. It appears that Origen would have had all the written resources that Anatolius had. But Origen also had a good working relationship with some prominent rabbis in Caesarea, and he would have had the ability to discuss the evidence with them privately.

[25] Eusebius Reports on Anatolius who wrote c. 277

Quotations from Eusebius with commentary by Olaf Petersen above showed a rule from c. 250 that allowed Nisan 1 to occur about two weeks before the vernal equinox according to the church in Alexandria. Pedersen also indicated that Bishop Demetrius began to send calculated dates from c. 230. From this we see that 95 years before the Council of Nicaea in 325, there was already an established tradition of when to determine the first month based on reckoning from Alexandria, which placed the vernal equinox on the first day of Aries, March 21, instead of on the eighth day of Aries according to the practice in first century Rome from which Josephus wrote. In other words, scholars from Alexandria (such as the alleged scholar Anatolius, who died c. 282) who read the Aries approximation by Josephus would understand Josephus differently from how Pliny the Elder would understand him, because they would interpret the

beginning of Aries differently. The Council of Nicaea did not have the purpose to determine when to begin the first month because it had already had a tradition from Alexandria, although one of its purposes was to determine whether to celebrate Easter on a Sunday or with the Jews (assuming the Jews kept it in the proper month). However, Eusebius evidently thought it was necessary to provide some justification for the method that had become standard in Alexandria.

The Easter rule using the full moon was a corruption (an incorrect understanding, much worse than a mere approximation) of what Josephus meant by Aries in his context of Rome compared to Alexandria where the beginning of Aries began differently. Thus the astronomically awkward Aries approximation in first century Rome was transformed into a full moon / vernal equinox rule from later Alexandria, which the Council of Nicaea accepted from the tradition of the Alexandrian Church. Those from Alexandria misinterpreted the meaning of Aries from Josephus in Rome, and they also neglected to consider the hidden matters of the rivalry between the Pharisees and the Sadducees, with the loss of the practice of the Aaronic priesthood. They did not realize how that rivalry finally led to Jewish confusion concerning the beginning of the first month.

John North 1983 provides a literal translation of the rule for determining Easter on p. 76 as follows, “As for Easter, the rule finally agreed was that it must be celebrated on the *Sunday next after (and not on) the 14th day of the Paschal moon, reckoned from the day of the new moon inclusive. The Paschal moon is the calendar moon whose 14th day falls on, or is the next following, the vernal equinox, taken as 21 March.*”

John North’s phrase “calendar moon” means an approximately computed lunar month. His phrase “Paschal moon” means Easter month. Note that the full moon is not explicitly stated here because the full moon is accepted to be on the 14th day of the lunar month; thus the full moon is there in a disguised form. North’s mention of the new moon is not the observed new crescent, but some cyclical pattern that approximates the observed new crescent. March 21 was a date of the Julian calendar, which was an approximation to the vernal equinox. Since the Julian calendar’s year was slightly longer than a true tropical year, over the centuries March 21 in the Julian calendar became much later than the true vernal equinox. That led to the replacement of the Julian calendar with the Gregorian calendar in 1582, so that March 21 would be a good approximation to the vernal equinox.

This rule of Easter for the Roman Catholic Church originated from bishops in Alexandria. It took a few centuries before uniformity over the precise method became standardized.

When the church historian Eusebius wrote about the time of the first month in relation to observing *pascha* (this is the Greek transliteration for Passover / Easter), he reserved detailed space to the writing of Anatolius alone. Anatolius wrote an essay in Greek

concerning the time for observing the *pascha*. The original Greek version no longer exists, but this was translated into Latin under the Latin title *De ratione paschali* (*About the Reasoning of Passover*). The Latin title will be abbreviated DRP as a designation of this work of Anatolius. The Latin text survives in eight hand-written manuscripts. This essay was translated from Latin to English based upon only one of the eight manuscripts by S. D. Salmond and first published between 1867 and 1872. Anatolius wrote this c. 277. He spent his early life in Alexandria where he was educated, and he later became the bishop of Laodicea. Some sources call him Anatolius of Alexandria, and others call him Anatolius of Laodicea.

Daniel P. McCarthy and Aidan Breen (see McCarthy & Breen 2003 in the bibliography) wrote a book on the essay on Passover (= DRP) by Anatolius, and this makes the translation by S. D. Salmond obsolete in some ways, but not completely. Breen compared all the surviving hand-written texts of DRP and produced a composite critical text, but this required some subjective judgments, and need not necessarily be the best representation of the original DRP. The version of DRP translated by Salmond contains portions that are close to the partial Greek version that Eusebius preserved. Breen's text primarily follows the Latin translation of DRP that was produced by Rufinus c. 380, which has differences from Eusebius. Latin was the first language of both Rufinus and Jerome. They were classmates who studied technical Latin and Greek together in Rome and were close friends until their public position with regard to Origen's writings clashed. Both of them translated many works from Greek to Latin. Rufinus was an idealist who is generally considered reliable.

One controversial innovation introduced by McCarthy is his theory of how Anatolius composed the dates in his 19-year cycle. McCarthy's theory is based on his belief that Anatolius used a calendric method like that of the Book of Enoch and the Book of Jubilees (pp. 71-72, 99-100 of McCarthy & Breen), although this latter is a solar calendar that does not use the moon. It does not make any sense to me that Anatolius would have done this, and hence I reject the dating method of the 19-year cycle as determined by McCarthy & Breen and especially the resulting implied date of the writing of DRP. I accept the date c. 277 as given by Ideler on p. 228 of volume 2.

The question arises concerning the reliability of Anatolius in the DRP and especially some of his calendric claims. For this purpose one should consider his DRP as a whole rather than merely the extract that Eusebius quoted. Nevertheless, even through a thoughtful examination of the controversial section itself, it is possible to make a reasonable assessment of its historical veracity. First I quote the heart of the specific text from Eusebius that quotes from DRP.

Quoting from Anatolius' DRP from Eusebius's *The Ecclesiastical History*, 7:22:16-19, "Therefore we say that they [= the Jews and any who follow them] who place the first

month in it [= the 12th sign of the zodiac], and determine the 14th day of the Pascha accordingly [= the 14th day of the first month in the 12th sign of the zodiac, thus before the vernal equinox], are guilty of no small or ordinary mistake. And this is not only our own statement, but the fact was known to the Jews, those of old time even before Christ, and it was carefully observed by them. One may learn it from what is said by Philo, Josephus, and Musaeus, and not only by them but also by those of still more ancient date, the two Agathobuli, surnamed the Masters of Aristobulus the Great. He was reckoned among the Seventy who translated the sacred and divine Hebrew Scriptures for Ptolemy Philadelphus and his father; and he dedicated books exegetical of the Law of Moses to the same kings. These writers, when they resolve the questions relative to the Exodus, say that all equally ought to sacrifice the passover after the vernal equinox, at the middle of the first month; and that this is found to occur when the sun is passing through the first sign of the solar, or as some have named it, the zodiacal cycle. And Aristobulus adds that at the feast of the passover it is necessary that not only the sun should be passing through an equinoctial sign [= the vernal equinox], but the moon also [= opposite end of the sky]. For as the equinoctial signs are two, the one vernal, the other autumnal, diametrically opposite each to other, and as the 14th of the month, at evening, is assigned as the day of the passover, the moon will have its place in the station that is diametrically opposed to the sun, as may be seen in full moons; and the one, the sun, will be in the sign of the vernal equinox, while the other, the moon, will of necessity be in that of the autumnal. I know of many other statements of theirs, some of them probable, others advanced as absolute proofs by which they attempt to establish that the Feast of the Passover and of unleavened bread ought without exception to be held after the equinox.”

#### [26] Scholars Judge the Credibility of Anatolius

Consider the above statement from DRP in light of the Scriptures, Philo, and Josephus. When discussing Gen 1:14 above, it was shown that the people in ancient Israel needed to know at the beginning of the month that followed the 12th month, whether it would be the first month or the 13th month. They needed to know to get ready to travel to Jerusalem to keep the Passover. Gen 1:14 speaks about lights from the heaven, not predicted lights. Advance prediction is not in harmony with the pattern for the new day or the new month based on Gen 1:14.

It was only until fairly recent times that the extent of use of the Babylonian calendar in geography and time became known so that we can properly evaluate Philo and thus realize, as shown above, that he indicates the Jewish first month cannot begin before the vernal equinox. Anatolius could not have been expected to know this. But even without knowing this, Philo makes no statement that compares the 14th day of the first month with the vernal equinox. Anatolius appears to be inventing this and using a non-existent history to promote his view.

To Josephus the Passover could fall about a week *before* the vernal equinox! This is explainable by recognizing that Josephus wrote his Antiquities from Rome about 23 years after the Temple was destroyed and the priests (who controlled the Temple and the calendar) were no longer in control of the calendar once the Temple was destroyed. In other words, the successors of the Pharisees were now in charge and they were free to change the calendar as they wished. The Alexandrian astronomers began the sign of Aries on the day of the vernal equinox, but Josephus put the vernal equinox on the eighth day of Aries. Hence Anatolius who was reared in Alexandria would have interpreted Josephus according to the Alexandrian meaning of Aries, and thus Anatolius would have a distorted view of Josephus. Anatolius wrote c. 277 CE.

From Scripture, Philo, and Josephus, it is clear that Anatolius promoted a view that was historically incorrect and Scripturally incorrect. At least with Philo he is responsible for knowingly distorting history.

The writings of Aristobulus have not survived, and the only source for what he wrote is Anatolius. We must use all the evidence at our disposal to judge whether we can believe Anatolius concerning what Aristobulus wrote. When Anatolius wrote about what Aristobulus wrote, there is no clear indication in the text as it has been handed down to us when the words of Aristobulus cease and the words of Anatolius continue. The one writer blends into the other with no boundary marker (equivalent of quotation marks). He may mislead the reader into thinking that all of the important words are those of Aristobulus, when in reality they may mostly be his own words (Anatolius).

Here are a few things to keep in mind when considering the writing of Anatolius. First, for about 30 years until the time that Anatolius wrote his essay DRP, *About the Reasoning of Passover*, c. 277, the Church in Alexandria was computing dates for the Pascha (Greek term for Passover), and these dates kept the Pascha after the vernal equinox. This differed from Jewish practice at that time in the third century, which did allow Passover to fall before the vernal equinox in some years. The Alexandrian Church sent this computed information to other selected churches so that all would be in agreement on the dates. Anatolius inherited this tradition. It would have been natural to expect him to try to justify this tradition as established in his home city. The evidence indicates that Anatolius was fabricating history to support his conclusion.

Fotheringham 1904 addressed the question of the credibility of Anatolius. In this article he discusses what Anatolius wrote in comparison to the writings of those whose names he mentions in DRP. After supplying the references to Philo on the vernal equinox compared to the first month on p. 109, Fotheringham concludes, "These passages prove nothing more than a general coincidence of the season of Nisan and the Passover with that of the spring equinox." When Fotheringham wrote this in 1904, the details about the Babylonian calendar and its geographical extent in use until the year 75 were not yet

known, so that one of the passages of Philo cited by Fotheringham could not properly be evaluated by him, which indicated a general equivalence of the first month of the Jewish calendar with the first month of the Babylonian calendar when Philo wrote in the early first century. Hence Philo supports the Jewish calendar's first month beginning on or after the vernal equinox. Nevertheless, Fotheringham does not think that Philo's Greek language usage is precise and does not think that Anatolius used him properly. I agree that Philo's language is loose.

The explanation of the meaning of the sign of Aries from Babylonia to the Mediterranean region became generally available when Otto Neugebauer wrote his three volume HAMA in 1975. This was not known to Fotheringham in 1904. He surely assumed that Aries began with the vernal equinox for Josephus. After a little discussion about the Passover phrase with Aries in Josephus, on p. 110 Fotheringham wrote, "Nor again is it right to press the phrase *en kriw* [= in Aries], though this is probably what Anatolius did." Here Fotheringham is saying, with the British English concept of "press", that Anatolius forced an astronomical precision to Aries that Josephus did not intend. His final comment on the passage is that "[Josephus is] merely indicating the normal position of the sun at the Feast of Passover, without defining any rule on the subject."

On p. 110 Fotheringham continued, "If therefore Philo and Josephus prove nothing but a general coincidence [of Passover in the spring], have we any reason for supposing that Musaeus and the Agathobuli said anything more definite?" From the hard evidence that Anatolius offers, Fotheringham concludes on p. 110, "... we have no evidence of a definite rule on the subject [the placement of the first month]." This is based on what is definitely known from the writers who Anatolius mentions, as of 1904.

In the book by George Ogg 1940, he wrote the following on pp. 265-266: "In a contribution 'The Date of the Crucifixion' to the *Journal of Philology*, xxix (1904), pp. 100-118, J. K. Fotheringham contends that these passages [from Anatolius] afford no such proof [that there was an anciently applied rule that Passover alone must be after the vernal equinox]. This contention, we [= George Ogg] are convinced, is sound." Hence we see that Ogg agrees with Fotheringham that we should not accept the testimony of Anatolius for his conclusion as valid history.

On pp. 24-26 of *The Chronology of the Ancient World* by Elias J. Bickerman (both the first and second editions, 1968 and 1980), he discusses the Jewish calendar. He was a secular Jew who was a professor of Jewish history at the Jewish Theological Seminary of America before he joined the faculty at Columbia University. On p. 60-69 of *The Cambridge History of Judaism*, volume 1 (edited by W. D. Davies and Louis Finkelstein, 1984), Bickerman discusses the Jewish calendar. In all three of these sources Bickerman never mentions Philo or Antiquities 3:10:5 of Josephus. Neither does

he ever mention Anatolius. Neither does he ever mention Gen 1:14. He does mention certain passages from the rabbinic writings, apparently giving some credence to that literature for valid history. From what I have seen, Jewish scholars such as Bickerman tend to write in a fashion so as to give historical value to rabbinic literature, although many modern Jewish scholars who are not in the Orthodox fold do not accept much evidence from rabbinic writings as historically valid before the Temple was destroyed in 70. Jews do not look favorably on the evidence from Anatolius. Bickerman himself was not a religious Jew, but his parentage was Jewish and he had a close personal relationship and consulted with several Jewish scholars from the Jewish Theological Seminary of America, often giving them credit in his footnotes. His writings often deferred to accepting the views of his scholarly friends who were more knowledgeable on rabbinic studies than himself. Bickerman maintained a professional relationship with both Orthodox and Conservative Jews.

A careful scholar will examine any historical evidence before accepting it. George Ogg had a D. D. degree (Doctor of Divinity – he was a Christian). Fotheringham is a scholar who blended science with history.

Emil Schurer wrote a history of the Jewish people that appeared in several German editions as well as several English editions. The early editions that were printed during Schurer's lifetime were from c. 1890 to c. 1900. After a gap of over 60 years, an upgraded edition was prepared in which Schurer's arrangement and viewpoints were maintained, but references to more recent works were added, and new discoveries were added. According to the Preface to Schurer 1973, the revisers suppressed their own views when such views differed from Schurer. In Schurer 1891 he wrote Appendix III about the Jewish calendar. In Schurer 1973 the upgraded revision of Appendix III was written by George Ogg according to the Table of Contents. The body of these appendices are quite similar as the preface promised, but the footnotes are more copious in the upgrade by Ogg. P. 371 of Schurer 1891 mentions the view of Anatolius, saying, "This explanation [for adding a 13th month] is characterized by Anatolius in the fragment of decided importance in relation to the history of the Jewish calendar ..." Yet Schurer, on the same page in a footnote mentions rabbinic writings and quotations that would apparently contradict the view of Anatolius. Schurer does not explain how to reconcile these differences despite his positive statement about the view of Anatolius.

On pp. 590 and 593 of Ogg's upgrade in Schurer 1973, Ogg dutifully gives Schurer's positive statement about the view of Anatolius, just as the Preface explained. On p. 590, Ogg's version of Schurer states, "[The Jews] on the basis of observation, intercalated one month in the spring of the third or second year in accordance with the rule that in all circumstances Passover must fall after the vernal equinox." At this point Ogg adds footnote 7 in which Ogg wrote, "The correct view is given in ...". Here in the footnote on p. 590 Ogg provides four references that disagree with Schurer, but the reader will

not know the “*correct view*” without looking up those four references!!

Ogg's first reference among these four is Ideler 1883, volume 1 (the first edition of 1825 was apparently identical to the second edition of 1883 for the chapter on pp. 477-583 titled, “Time Reckoning of the Hebrews”). In this chapter Anatolius is never mentioned. Josephus' Antiquities 3:10:5 is mentioned on pp. 514 and 570, and on p. 571 a portion of the Talmud is quoted in which a judgment for adding a 13th month is given by Gamaliel the Elder, using a variety of conditions. Here the Talmud is used in a manner that does not conform to Josephus, and Ideler makes no attempt to reconcile these views. Ideler does mention Anatolius nearly a dozen times in volume 2 from pp. 213 to 231 where he discusses the Christian calendar. On p. 228-229 Ideler mentions Eusebius' quotation from Anatolius concerning the vernal equinox, but he expresses no opinion concerning any historical validity it may have. The fact that Ideler confines Anatolius to the pages devoted to the Christian calendar and avoids mentioning him in the chapter devoted to the Jewish calendar, shows his doubt of the historical validity of the view of Anatolius. Ideler's goal in discussing Anatolius in volume 2 is in relation to the history of how mainstream Christianity ultimately determined the date of Easter and the month in which Easter should fall. Anatolius is significant for Christian history.

Ogg's second reference among these four is F. K. Ginzel 1911. Pp. 36-45 have the title “From Ezra to Rabbi Judah the Nasi”, which covers the calendar during the time period c. 450 BCE – c. 200 CE. He treats this as a single period without recognizing that any change may have occurred after the Temple was destroyed in 70, and he does not mention this significant event, which resulted in a change in leadership among Jews in Palestine. Ginzel uses some rabbinic references for this period, showing his dependence on this literature whose earliest date is c. 200. Since this literature was produced by the successors of the Pharisees and we have no surviving words from the priests who controlled the calendar before the war broke out in 66, the value of the rabbinic literature for the period before 66 is problematic, and it cannot be considered a primary source of history from before that time. The rabbinic literature mentions that a variety of factors were considered for the determination of the first month, and the subjective decision was in the hands of the Sanhedrin or its President. On the bottom of p. 67 and the top of p. 68 Ginzel mentions Anatolius as quoted by Eusebius concerning the vernal equinox. Ginzel follows this with a remark that the Sanhedrin would have wanted to stick to their tradition rather than make a significant change in the calendar. He considers the statement by Anatolius to represent a significant change based upon its comparison to the rabbinic literature. The reader is left to conclude that he does not accept the view of Anatolius to represent correct history.

Ogg's third reference among these four is his own book, Ogg 1940, which was discussed above. Ogg agreed with Fotheringham, that the historical validity of the view of Anatolius should be rejected.

Ogg's fourth reference among these four is Bickerman's first edition as discussed above, in which Bickerman favors the view of the Talmud, which disagrees with the view of Anatolius.

Thus we see that while Ogg is constrained to only give the view of Schurer in the body of Appendix III, in this footnote he only provides references that contradict Schurer after his statement in the footnote, "The correct view is given in..."

On p. 593 of Appendix III, Ogg mentions the example that Schurer 1891 gave on p. 371, in which rabbinic accounts of adding a 13th month are given based on a variety of conditions, and Ogg follows this up in footnotes 17 and 19 on pp. 593-594. Then on p. 593, Ogg, playing the role of Schurer, mentions "Anatolius, in a fragment of great importance for the history of the Jewish calendar preserved in Eusebius ..." Here he soon makes the positive statement, "If, therefore, it was noticed towards the end of the year that Passover would fall before the vernal equinox, the intercalation of a month before Nisan was decreed." At this spot Ogg places footnote 19, where he states, "On other reasons for intercalation see especially ..." Here Ogg supplies rabbinic references that contradict Anatolius.

Therefore we have seen that while Ogg is true to his role that allows Schurer's views on Anatolius to prevail in the body of Appendix III, in the footnotes Ogg provides references that contradict Schurer, and none that favor Schurer's view of Anatolius. Only a superficial reading of this appendix, avoiding the footnotes, would enable a reader to conclude that Anatolius is historically correct.

#### [27] Summary Concerning Anatolius

Gen 1:14 points to the lights in the heaven to trigger the beginning of the days, festivals (this includes months), and years. On the day that followed the 12th month, ancient Israel had a need to know whether the first month was beginning or the 13th month was beginning. There is no implication that Gen 1:14 permits predicting future light triggers to determine the beginning of years. The Easter rule that was first employed by the bishops of Alexandria c. 250 (perhaps going back to c. 230) is based on a calculated or calibrated future prediction that compares the 14th day of a month with the vernal equinox. This is artificial compared to the simplicity of Gen 1:14.

Within the Persian Empire the Jews accepted the Babylonian month names into their own calendar in Jerusalem at some time after 499 BCE. In the fifth century BCE in which the Jews accepted these month names, the Babylonian calendar's first month began on or after the vernal equinox. The Bible does not provide any information that supports the Easter rule. Philo contradicts this rule by supporting the principle that the first month cannot begin before the vernal equinox because he states that the Jews go along with the other nations that use a lunar calendar with the vernal equinox for the first month.

Anatolius wrote an essay on the Passover c. 277 in which he supplied alleged history of the Jews that validated the Easter rule that had been in use since c. 250 (perhaps going back to c. 230) by the bishops from Alexandria. Anatolius fabricates an incorrect view of Philo's statements concerning when the first month begins. Anatolius misunderstands Josephus on this matter because the meaning of the sign of Aries was different in Alexandria (where Anatolius lived the first part of his life) compared to most of the rest of the Roman Empire during the first century when Josephus wrote his works. The Easter rule promoted by Anatolius was based on a distortion of his Jewish sources and should be rejected as a representation of what Jews were doing before the Temple was destroyed.

The belief that the “**nearest new crescent to the vernal equinox**” should begin the first month originates with a misunderstanding of what Josephus wrote by people in Alexandria where the sign of the zodiac named Aries (our Latin name) had a different meaning in time of the year than it had in Rome where Josephus wrote, Anatolius did not understand what Josephus meant, and what Anatolius wrote is a contradiction to what Josephus meant. The alleged history to which Anatolius refers before Philo has no substantiated history behind it, and this alleged history contradicts both Philo and Josephus.

Anatolius claimed that Origen supported his own views on the calendar, but this is not true. Anatolius should have known that Origen did not accept his views because Anatolius spent some time in Caesarea at the library that Origen built. This library contained the works of Philo and Josephus from which Anatolius drew his information. Origen's own works were in this library where Anatolius had access to Origen's views on the time of the Passover. Origen knew that the Jews had contradictory viewpoints on when the first month should occur. Origen quoted from Ex 12:1-2 multiple times and admitted that he did not know what was told to Moses and Aaron for the first month. The knowledge of how the Babylonian calendar worked in the first century was not known at the time of Origen.

**The evidence points to the conclusion that Anatolius was trying to justify the practice of the Church of Alexandria rather than objectively show what was actually known.** The use of the “**nearest new crescent to the vernal equinox**” must be rejected as a misunderstanding of Josephus, and as false promotion by Anatolius.

[28] W. Robertson Smith's Commentary on Barley in Exodus 9:31-32

Some people favor the examination of barley in Israel to be the sole factor in order to determine the first month of the biblical year. When they see Gen 1:14-18, they explain this to mean that the annual effect of the sun to ripen barley is the correct way to interpret Gen 1:14 to determine the first month. They refer to this as indirect reasoning of the lights in the heavens to recognize the first month rather than using the lights

directly to determine the first month.

The purpose of this chapter is to explain the greatest problem with the above reasoning in favor of the use of barley alone. Other questions need to be addressed concerning this matter, but those questions will be postponed until later. The Hebrew expression that is found six times in the Tanak that is relevant to this question is *chodesh ha-aviv*, literally “month of the *aviv*”. It will soon be shown that there is a context where the word *aviv* refers to some aspect of the growth of barley.

From the earliest place in **Israel** where barley is harvested to the latest place in **Israel** where barley is harvested is **seven** weeks, which is close to two months. Therefore barley alone does not identify only one month. This objection is answered by some people by saying that it is the **first** location within Israel that shows the condition of *aviv* that matters for the determination of the first month. The problem with this explanation is that the Tanak does not say “month of the **first** *aviv*”; it omits the word “**first**”. Hence people who favor the use of barley alone are left with the problem of assuming their conclusion by adding the extra word “first” that does not occur in the Hebrew. The meaning and use of the word *aviv* is a crucial key here. This word occurs in Ex 9:31 and Lev 2:14 besides the six places where “month of the *aviv*” occurs. The latter verse in Leviticus will wait until later.

In the context of the hail plague that occurred throughout Egypt, we note the following.

Ex 9:31, “And the flax and the barley were ruined because the barley [was in] ear [= *aviv*] and the flax [was in] flower [1392 *gevol*]”.

Ex 9:32, “But the wheat and the spelt were not ruined because they [ripen] later.”

W. Robertson Smith wanted to obtain information on the time of the year of the occurrence of the hail plague from which the above is quoted. This is the eighth plague (Ex 9:22-32). He wrote to three knowledgeable people in Egypt who had personal experience or knew others who had personal experience on the growth of barley in Egypt, and he received responses from them. The following two quotations are from p. 299 of Smith's paper from 1883.

“The data of the [barley] harvest varies greatly in different parts of Egypt.”

“The difference between upper and lower Egypt is about 35 days.”

Based on information from this paper, the 35-day period for the typical time of reaping barley in the south to the typical time of reaping barley in the north is the time from latter February to the first part of April. When this is studied in more detail, it is seen that the hail plague would have occurred in the middle of February at the latest. This is outside the context of Ex 12:1-2.

The real problem for those who favor the use of barley alone is that the reason given in

Ex 9:31 for the ruin of the barley crop in all of Egypt is that it was *aviv*, and this applies to the 35-day variation in the growth of barley. **Hence the meaning of the word *aviv* requires too wide a variation in growth to identify one specific condition for which to test to determine that the first month has arrived** (using the barley hypothesis).

**People who attempt to use a test on barley for the first month invent a definition of what to test for that is not in the Tanak, and whatever it is, would be contrary to the wide use of *aviv* in the hail plague. It should now be clear that the phrase “month of the *aviv*” does not describe only one month. This indicates that the phrase shows a name that does not uniquely describe only one month.**

[29] Historical Aspects of Barley and the First Month

(A) The Tosefta c. 250 CE

The rabbinic writing known as the Tosefta was published c. 250 CE and was a follow-up to the Mishnah from c. 200, The Tosefta is the first **rabbinic** document known to speak about when the first month should occur after the Temple was destroyed in 70. When the Tosefta does mention the barley, it does *not* do so in relation to the wave sheaf offering. The Tosefta does *not* mention the Hebrew word *aviv*. The Mishnah does discuss the wave sheaf offering, but the Mishnah does not require that any test must be applied to that offering to validate that the month is the first month. The Mishnah does not discuss the subject of how the first month should be determined. That question is left for the Tosefta. The Mishnah mentions the word *aviv* one time, where the context shows it to mean barley that is far from being ripe.

(B) The Early Church and the First Month

Neither Philo, nor Josephus, nor Origen, nor Hippolytus, nor Anatolius indicate that the barley had anything to do with the determination of the first month.

(C) History of the Viewpoint that Barley alone points to the First Month

Above, the use of Babylonian month names by Ezra and Nehemiah in the context of Jerusalem show that barley was not being used to determine the first month because the name Nisan replaced the use of Abib for pointing to the first month, and there would have been confusion using Babylonian month names if that had disagreed with some method to use barley that was actually being used.

Above, the historical evidence of the Passover Letter showed that the barley could not have determined the first month in the year 419 / 418 when the Aaronic priesthood controlled the calendar.

Above, there is a quote from Philo to show that he believed that the heavenly lights determine the time of the festivals, and not agriculture.

There were multiple competing calendars promoted within the Dead Sea Scrolls. This

shows that freedom prevailed among Jews who chose to differ on the calendar. All of the competing calendars were based upon astronomy alone. The vernal equinox was the key for the focus of the start of the first month among these calendars, as well as for Philo. Barley is not mentioned in any calendars of the Dead Sea Scrolls for the calendar.

**The earliest known historical record of any Jew or Israelite promoting the use of barley alone to determine the first biblical month is that of Anan ben David who taught c. 770.** This account was reported c. 1000 by Al-Biruni 1879.

On p. 777 of Gil 1992 we find, “The origins of the Karaites and their early development are shrouded in obscurity. The sources which describe these beginnings single out the figure of ‘Anan, who is considered the founder of Karaism.” On p. 778 we read: “As to the Karraite sources themselves, Qirqisani says that 'Anan lived in the days of the second Abbasid caliph, the founder of Baghdad, Abu Ja'far al-Mansur (754-775), which fits what has been said above.”

On p. 211 of Schur 1995 we find, “Now that Anan's real position in Karaite history begins to be better understood, Benjamin Nahawendi looms much larger, as he was the first real leader and unifier of the sects which eventually made up Karaism. He hailed from Nihavend in Persia (in the province of Media), and might have lived (in the first half of the ninth century) in Persia or in Iraq.” P. 213 states: “Nahawendi’s importance is attested to by medieval Arabic accounts, which call the Karaites ‘the followers of Anan and Benjamin’. Saadia Gaon and Judah Halevi regarded Anan and Nahawendi as the two founders of Karaism.”

The Karaite named Levi ben Yefeth wrote a book about 1006-7 in which he mentions three prevalent views of how to determine the first month. This is reported on pp. 303-304 of Ankori 1959. The first view he presents is that of the Rabbanites who use the modern calculated Jewish calendar. The next quotation from pages 303-304 has square brackets with words added by Zvi Ankori in the midst of his translation from Levi ben Yefeth, where we read, “The second group consists of people in the Land of Shine'ar [= Babylonia] from among our brethren the Karaites. They follow the [computation of the vernal] equinox alone; yet, they stipulate certain conditions which are different from those stipulated by the Rabbinates. This is why we have listed this group as separated from the Rabbinates... Now, this second group does not inquire, nor search, for the abib at all; [its members simply] wait and do [the proclamation of Nisan] when the sun reaches the Constellation of the Ram...”

In the Middle Ages the Constellation of the Ram meant the 30 degree segment of the zodiac beginning with the vernal equinox, not what it meant to Pliny the Elder and Josephus, and not the actual star group that formed the constellation.

Next, on page 304, Zvi Ankori, continues his translation: “The adherents of the third group [i. e., the Palestinian-oriented Karaites] observe [the New Year] on the strength of

abib alone and they do not investigate [the position of] the sun at all.”

The Karaites in Israel today are a continuation of the third group mentioned above by Ankori. However, they are not organizationally unified. There are other Karaites who use the vernal equinox alone as with the second group reported by Ankori above.

All available historical evidence before Anan ben David c. 770 is against the use of barley alone as the determining key for the first month.

[30] Abandonment of the word *aviv* to indicate the First Month

If the name or word *aviv* had been the key element to determine the first month into the first century, then its importance would have elevated the biblical phrase *chodesh ha-aviv* to continue in use down into the first century by the Jews. The phrase “month of Nisan” is used by the Maccabees and by Josephus, as well as by other books of the Tanak after the Pentateuch. The word *aviv* occurs only once in the Dead Sea Scrolls in the making of bread. It only occurs once in regard to agriculture within the rabbinic writings, where it refers to an unripe state of grain that was not nearly ripe.

[31] The Problem of a Biblical Test to Perform on the Barley

In discussing the Karaites, pp. 392-393 of Nemoy state, “Some of them [from the Middle Ages] begin the ‘(month of the) fresh ears’ (with the appearance) of (any kind of) green herbage, whereas others do not begin it until (fresh) garden-cress is found all over Palestine; others begin it only when (at least) one piece of ground becomes ready for harvest; still others begin it even when only a handful of corn is ready for harvest.”

This indicates that Karaites in the Middle Ages who wanted to use vegetation to determine the first month could not agree among themselves on the method, undoubtedly because the Tanak does not provide a botanical description to determine the month of *aviv*.

**Many modern adherents of the use of barley to determine the first month attempt to use the wave sheaf offering to create a definition of how to test barley for the first month. This will be discussed a below.**

Among all the biblical contexts containing the word *aviv*, the only one that has the word barley is Ex 9:31. The other key verse, Lev 2:14, applies to all grains, not just barley. It is certainly true that barley is the first of the grains to ripen in Israel as the winter departs, but the word *aviv* is not defined clearly in the Tanak. The phrase *chodesh ha-aviv* is open to some interpretation, but it is clear from the hail plague that *aviv* has a broad meaning. It is literally “month of the ears”.

**Those who promote the use of barley alone strongly argue for the first appearance of “*aviv*” within Israel, but the Tanak is not explicit on this. The actual phrase *chodesh ha-aviv* does not possess the detail of “first place in Israel to show it”.**

From the earliest location within Israel that barley may be harvested (the lower Jordan River valley) until the latest location in Israel that barley may be harvested (the northern higher elevations) *spans a time length of seven weeks*.

The reader who favors the barley usage alone for the first month needs to take a step back for a moment and recognize certain assumptions that were never stated by some of the modern Karaites. The phrase *chodesh ha-aviv* may be understood as descriptive of that month of the year (*but not exclusive to only that month*) instead of being a defining phrase whose interpretation explicitly can only apply to one month.

Since the year 2000 there have been multiple independent groups of people examining the barley in Israel to make a determination for the first month. Every two or three years there is a lack of unanimity on whether the month coming up should be considered the first month by these groups. This is despite the fact that they seem to be trying to use the same criterion that is not stated in the Tanak. Part of the problem is that one field of barley does not show all stalks of barley at the same stage of growth. Then the question becomes the definition of a percentage of the stalks. Such a percentage is arbitrary. How many stalks do you count to get a percentage?

The criterion of what to look for in the barley is promoted to be the definition of *aviv*. But where in the Tanak is there such a definition of *aviv*? There are only two possible Scriptures available: Ex 9:31 and Lev 2:14. Neither of these defines a narrow criterion.

[32] The Time and Geographical Context of Exodus 12:1-2

Ex 12:1-2, “And YHWH said to Moses and to Aaron in [the] land of Egypt, saying 'This month [shall be] to you [the] beginning of months, it [shall be the] first of [the] months of the year to you.'”

The question before us is whether there is anything in the biblical context of these two verses to inform us about the timing of the first month.

When I visited Dr. David Marshall (a specialist in barley and wheat genetics) at his office at Texas A & M University in 1992, he told me that in one of his trips to Egypt, he visited with farmers who still used the ancient sickle to harvest barley on their personal plot of land. They cut the stalks when the barley kernels had about 30 percent moisture according to his tests. The farmers did not know the percentage, but they could tell when to cut it by their personal experience. That 30 percent value is low enough moisture to obtain flour from the barley, and that is mildly ripe. Dead ripe has from 8 to 10 percent moisture, and that is very hard kernels. At very early stages of the ear, the ear has over 90 percent moisture. When machinery is used to harvest barley, the moisture content may be about 15 percent because the yield of flour is greater at that percentage. The additional time on the stalk for the moisture content to decrease allows the ears to gain more solid matter and yield more flour. Using primitive methods the Egyptian farmers

do not wait until the barley is very ripe before harvesting it because some of it would then shatter (pieces would fall off the stalk) and there would be some loss of the grain.

At the time of the hail plague, the barley in the far north of Egypt would not have been ripe because if it had been ripe, then the barley in the far south would have been five weeks further ripe and with primitive methods of harvesting, they would not have let it last that long on the stalk in the far south. Since Ex 9:31 uses *aviv* to describe all of the barley in Egypt at the time of the hail plague, at least some of the barley was not yet ripe (in the north) yet it was still called *aviv*. **Hence *aviv* must include stages of barley before it is ripe.**

Based on information from W. Robertson Smith 1883, the 35-day period for the typical time of reaping in the south to the typical time of reaping in the north is the time from latter February to the first part of April. Hence the hail plague had to occur before the latter part of February. **When this is studied in more detail, it is seen that the hail plague would have occurred in the middle of February at the latest. This is not in the time context of Ex 12:1-2 which is certainly more than a month later for the start of the first month.**

Many people who favor the use of barley alone to determine the first month of the biblical year make the claim that the hail plague is part of the context of Ex 12:1-2, or Ex 13:4 is part of the context of Ex 12:1-2 and hence the claim is made that the word *aviv* is part of the meaning to be associated with Ex 12:1-2. This is false reasoning because of the time gap that breaks the context. **Ex 12:1-2 is silent concerning what Moses and Aaron were told at that time.** The hail plague was the eighth plague and was not really very close in time to Ex 12:1-2 when the events are closely examined.

Consider now the contextual relationship between Ex 13:4 and Ex 12:1-2. Ex 12:1-2 is part of instructions prior to the Passover. Then the Passover itself occurs. Ex 13:4 is a context beyond the actual Passover, and it discusses future years rather than the first Passover. Thus Ex 13:4 is not within the context of Ex 12:1-2. Ex 13:4 is not a clear Scripture just as Ex 12:1-2 is not a clear Scripture concerning when it occurs.

The geographical context of Ex 12:1-2 is Goshen in Egypt, not ancient Israel. Moses had never been in ancient Israel and later Moses commissioned 12 spies to spy out the land of Israel to know what it was like. Nothing in the context of Ex 12:1-2 indicates that Moses was told about the state of the barley in Israel.

The point to this discussion is that the context of Ex 12:1-2 does not include the hail plague or Ex 13:4.

[33] Septuagint's Translation of *aviv*

The Septuagint translation of the Pentateuch was made c. 270 BCE when some Jews from Alexandria annually visited Jerusalem to witness the ceremonies associated with

the first month. If barley was being used to determine the first month at that time, then the meaning of *aviv* would have been associated with the barley in some specific way so that the meaning of *aviv* would have been well known.

The use of the Septuagint here does not imply that it has the authority of inspiration, but it is used because it is a primary source of how Jews from Alexandria understood the word *aviv* during that time in history.

Concerning all six places in which the Hebrew expression *chodesh ha-aviv* (month of the *aviv*) occurs in the Tanak (Ex 13:4; 23:15; 34:18, 18; Deut 16:1, 1), only one expression is used in the LXX, the Greek *meni ton neon*, which means “month of the new”. The grammatical form of *ton neon* is plural, so that it implies a plural noun. This consistency in all places lends weight to the belief that the translators wanted to use the same meaning in all places; however, it indicates that they were not sure of its meaning because there is no plural noun. It seems safe to accept the belief that the translators knew it referred to new plant growth with plural connotations. The word “new” can imply freshness or recent growth, and does not commit to any degree of ripeness or what vegetation was involved. In all six places the very literal careful NETS translation of the LXX has “month of the new things”, thus highlighting the noticeable lack of clarity for the word *aviv*. These six places are seen in the Greek on page 922 of Hatch and Redpath under the word for month, or they may be looked up individually in Brenton.

In Ex 9:31 where *aviv* occurs, a literal translation from the Hebrew is “barley [was in the] ear”. The LXX has the Greek word *parestekuia* where *aviv* occurs, and this Greek word is discussed on pp. 56-57 of Lee 1983. Lee provides a few ancient examples of its use in an agricultural context. On p. 56 Lee provides the approximate choice of meanings “‘be ripe', 'be fully grown'”. It makes sense that the translators were not aware of the variation of difference in development of the barley from southern Egypt to northern Egypt of five weeks, so that it could not be fully grown throughout the region (otherwise it would have been harvested in the south where it would have been too ripe to leave on the stalks). The Greek with translation may be seen in Brenton (who did not have the examples that Lee had); the Greek is also on page 786, column 1, of Hatch and Redpath under the Greek word *krithe*, meaning barley, at Ex 9:31. It is plausible that the translators of the LXX at Ex 9:31 created the meaning of *aviv* from this context rather than from a deep knowledge because they did not carry this meaning into any of the other seven uses of *aviv*. Perhaps they did not remember that they gave this meaning to *aviv* when they reached its next use in Ex 13:4 where they simply used the single vague Greek word meaning “new [things]”.

In Lev 2:14 where *aviv* occurs, the LXX has *nea*, which means “new” or “fresh”. This is not precise. The very literal careful NETS translation contains the following group of words, “new, roasted, pounded, wheaten-groats”. This must include both *aviv* and

*karmel*. Here it seems that the translation for *aviv* is “new”, and the translation for *karmel* is “wheaten-groats” because that follows the order of the two Hebrew words. This makes it doubtful that the translators of the LXX knew the meaning of either Hebrew word.

This shows that the LXX is imprecise and vague in every case for *aviv* except where the context has much to offer in Ex 9:31. This indicates that the Jews in Alexandria do not seem to be aware of any important significance for this Hebrew word, although some of them undoubtedly went to Jerusalem during the seven days of unleavened bread, witnessed the wave sheaf offering, and understood how the first month was determined. It does not make common sense to think that the calendar's first month after Ezra and Nehemiah was being determined by the use of the word *aviv* when the LXX translation is considered.

#### [34] The Meaning of Sheaf [*omer*] in the Wave Sheaf Offering

The passage on the wave sheaf offering in Lev 23:10-16 contains the word sheaf [6016 *omer*] in Lev 23:10, 11, 12, 15. This Hebrew word occurs in the following ten other places: Ex 16:16, 18, 22, 32, 33, 36; Deut 24:19; Ruth 2:7, 15; Job 24:10. From Ex 16:36 we see that it is “**a dry measure of volume**”, but Ruth 2:7, 15 provide an alternate meaning, namely “**a sheaf of growing stalks with expected ears of grain**”. We are faced with the problem of resolving the ambiguity between the two meanings of *omer* in the context of the wave sheaf offering.

The second meaning above does not indicate any particular stage in the development of the grain on the stalks. A growing standing sheaf may have unripe ears of grain or ripe ears of grain.

The key to understanding which of these two meanings is correct for Lev 23 is based upon the fact that the priesthood at the Temple was practicing the wave sheaf offering each year from the time of Ezra and Nehemiah until the Temple was destroyed, along with the fact that the Septuagint used different Greek words to translate the two different meanings. The Septuagint should preserve the correct meaning because some Jews from Alexandria would have made annual visits to Jerusalem to keep the Passover and to witness the wave sheaf ceremony. Thus personal experience of observers of the ceremony should know the meaning of *omer* (sheaf) in Lev 23. Modern scholars who specialize in the Septuagint understand that the translators' knowledge of the Greek language exceeded their understanding of the Hebrew language, so that the translators were very likely from Alexandria.

For the wave sheaf offering the Septuagint uses the Greek word *dragma* as the translation of *omer*. This word *dragma* is also used in Deut 24:19; Ruth 2:7, 15. Moreover, in Gen 37:7 where the Hebrew word for sheaves is *aluma* (Strong's number 485), its Greek translation in the Septuagint is also *dragma*. The Septuagint translation

by Brenton for Gen 37:7 is: “I thought ye were binding sheaves [= *dragma*] in the middle of the field, and my sheaf [= *dragma*] stood up and was erected, and your sheaves [= *dragma*] turned round, and did obeisance to my sheaf [= *dragma*].” (Plural forms of *dragma* are used where the translation is plural.) **Thus a bundle of tied stalks is called a sheaf (*dragma* in Greek).** Hence this would be its meaning where *dragma* is used for *omer* in the wave sheaf offering in the LXX.

Gustaf Dalman first gave the above explanation for the Hebrew word *omer* in the wave sheaf offering, and his explanation has been accepted by many Jewish commentators including the commentary on Leviticus in the series by the Jewish Publication Society of America.

On page 73 of H. L. Ginsberg 1982, he translates *omer* in Lev 23 as “armful”, judging the quantity that might be tied into a bundle and handed to the priest.

On page 506 of Danby's translation of the Mishnah in Menahot 10:4, talking about the wave sheaf ceremony and specifically the grains of barley (after they were separated from the husks), we find, “They put it in a grist-mill and took therefrom a Tenth [of an Ephah of flour] which was sifted through thirteen sieves.” Danby added the explanation in square brackets, “a Tenth [of an Ephah of flour]”. Ex 16:36 states, “Now an *omer* is one-tenth of an ephah.” Danby is showing the common rabbinic understanding that the Mishnah accepts the viewpoint that the Hebrew word *omer* means the dry measure quantity instead of a tied bundle of stalks. This contradicts the understanding given above using the Greek word *dragma* from the Septuagint, which was translated long before the Temple was destroyed.

Modern Jewish scholars who are not Orthodox Jews reject the meaning of *omer* given in the Mishnah. Typically, Orthodox Jewish scholars accept the rabbinic writings as inspired in most situations, so that they accept the meaning of *omer* in the Mishnah. The main reason for accepting the meaning in the LXX is that the LXX is a primary historical source from the time that the LXX was written when the wave sheaf ceremony was still being performed. While it is true that we do not possess any complete copy of any books of the LXX from before the fourth century CE, so that on picky points of an isolated verse there is uncertainty concerning the original LXX, yet surviving handwritten copies do have much in common. Caution must be exercised when using the LXX, especially because the translators sometimes did not know the correct meaning of a Hebrew word, **The Mishnah is not a primary historical source because it was written about 130 years after the Temple was destroyed. The original performance of the wave sheaf offering was not available to the writers of the Mishnah.**

The conclusion should be that the *omer* is a bundle of stalks of grain. It remains to be discussed whether there is anything else in the context of the wave sheaf offering to

indicate any particular stage of growth of the grain.

[35] Wave Sheaf Offering and the Harvest / Crop (Hebrew *ketseer*)

In Lev 23:10 the typical translation shows the English word “harvest” twice for the Hebrew word *ketseer* [7105]. Sometimes an English word may have normal implications that are not necessarily implied by the Hebrew word. This is true for the Hebrew word *ketseer*. The implication of this word is discussed next.

In the recent past, some Karaites have promoted the claim that the word *harvest* in Lev 23:10 means “*harvest-ready*”, and thus **it makes the wave sheaf ceremony the most important factor among some Karaite claims that barley alone must determine the first month**. I have examined several books about the Karaites and their claims about the first month, and such writings do discuss the wave sheaf offering because of a historical dispute in how the count to the Feast of Weeks should be made. The Karaite writings from the Middle Ages that discuss the wave sheaf offering do **not** promote the idea that the word *ketseer* must mean “*harvest-ready*”. This will now be discussed.

The word *ketseer* occurs on page 894 of BDB where three meanings are derived from the biblical contexts: (1) “process of harvesting”; (2) “what is reaped, harvested, crop”; (3) “time of harvest”. The second meaning is often overlooked. Consider some examples.

Isa 17:11, “In that day you will make your plant to grow, and in the morning you will make your seed to flourish. But the harvest [= *ketseer*] will be a heap of ruins in the day of grief and desperate sorrow.” Here the word harvest refers to the crop as it is still growing at the time of the invasion. In this sense the word harvest simply refers to the crop in its current state before the time of typical general reaping.

Joel 1:10, “The field is wasted, the land mourns. For the grain is ruined, the new wine is dried up, the oil fails.”

Joel 1:11, “Be ashamed you farmers, wail you vine dressers, for the wheat and the barley, because the harvest [= *ketseer*] of the field has perished.” Again the word harvest refers to the crop, but not the time of normal harvest.

The variation in the biblical meaning of the Hebrew word *ketseer* defeats the claim that the wave sheaf offering **must** occur when the general barley harvest is about to begin. This Hebrew word may merely refer to the crop itself regardless of how close it is to the time of the general harvesting. No doubt this is the reason that the Karaites from the Middle Ages did not attempt to make this argument in their writings.

Concerning the conjecture that in Lev 23:10 the word *ketseer* must mean “**harvest-ready**”, there is no biblical evidence that the state of the stalks of barley in the wave sheaf offering had to reach any particular state, and there is no evidence that it was eaten by anyone after the ceremony. The burden for evidence is upon the person making the

conjecture.

**Several reasons have been given above to show that the barley does not determine the first month. The first reason is that Scripture does not say that the barley determines the first month. The second reason is that the hail plague shows too great a variation for the word *aviv* to specify one test to perform on the barley. The third reason is the adoption of the Babylonian month names. The fourth reason is the replacement of the use of the word *aviv* for the first month with the word Nisan. The fifth reason is the apparent lack of understanding of the LXX translation for the word *aviv*. The sixth reason is the difficulty in giving a test that various peoples can use and avoid disagreements when attempting to apply such a test; however, the crux of the problem is that the Scripture does not have any statement of a test. The seventh reason is that Gen 1:14-18 points to the lights in the heavens to determine the festivals. The eighth reason is the statement by Philo that the cycles of the lights in the heavens determine the elements of the calendar.**

Answering the above points is a challenge for those favor the sole use of barley for the first month. These points argue against the insistence that the ambiguous word *ketseer* must mean “**harvest-ready**”. The history of the Karaites from the Middle Ages does not attempt to promote this view of “**harvest-ready**”. Their emphasis is on the phrase *chodesh ha-aviv*, and specifically the word *aviv*.

[36] The Lack of firstfruits [*bikurim*] in the Wave Sheaf Offering

The wave sheaf offering cannot be understood without a deep study of Lev 23:10, which still has an important item for examination aside from *omer* and *ketseer*, discussed above.

The wave sheaf offering is discussed in Lev 23:10-16; Deut 16:9-10. In these Scriptures the Hebrew word *aviv* does **not** occur and the Hebrew word *bikurim* does **not** occur. However, both of these Hebrew words do occur in Lev 2:14. The passage Lev 2:14-16 explains how to perform a firstfruits [106 *bikurim*] offering of grain. Lev 2:14-16 explains what to do with the firstfruits offering, including mashing it into a type of cereal, thus showing its grain to have value, In contrast to this, nothing is said about any specific usefulness of the content of the sheaf. After the performance of the wave sheaf offering, Scripture is silent about what may happen with the sheaf. The word *omer* (sheaf) does **not** occur in Lev 2:14-16. There is so little in common between Lev 2:14-16 and the wave sheaf offering that they should not be associated with one another.

When a farmer in ancient Israel grows a crop and the crop reaches a **useful** state of growth, at anytime afterward the farmer is expected to contribute a portion of the new crop to the priesthood. This contribution of a **useful** portion of the new crop to the priesthood is called **firstfruits** [1061 *bikurim*]. This word may also be translated “ripe” in contexts that do not involve a contribution to the priesthood. The word “ripe” implies

useful. The word *bikurim* is the only technical word in Hebrew that means “firstfruits” in the sense of giving a commanded contribution to the priesthood.

In Lev 23:10 some translations have the word “firstfruits” and some have the word “first” (or “beginning”) for the Hebrew word *raysheet* (Strong's number 7225). The question before us is whether the word *raysheet* should be translated **firstfruits**. This suggested translation “firstfruits” for the word *raysheet* is confusing because *bikurim* properly means firstfruits. The word “firstfruits” (the Hebrew word *bikurim*) implies usefulness. The answer to our question relates to the technical difference between the Hebrew words *bikurim* and *raysheet*.

When a fine point of the law of Moses is under discussion in a translation of the Tanak where many contexts are involved, it is generally safer to consult a committee translation made by Jewish scholars because in a multitude of counsel there is wisdom, and because Jewish scholars would be more sensitive to fine points of the law than others. Two recent committee translations by Jewish scholars are Tanakh-JPS and Tanach-Stone. The former of the two had contributors from all branches of Judaism, while the latter is an Orthodox rabbinic work that was influenced by Jewish sages of the past.

Neither of the above two committee translations of Lev 23:10 use the word “firstfruits”.

Prov 3:9, “Honor YHWH with your wealth, and with the best [= *raysheet*] of all your produce.” Here Tanakh-JPS translates *raysheet* “best”, but Tanach-Stone translates it “first”. Some translations use “firstfruits” here. This indicates a subjectivity in one's decision of how the context should be viewed.

The word *raysheet* occurs 51 times. There are two places among the 51 in which both Tanakh-JPS and Tanach-Stone agree to use “firstfruits” for *raysheet*: Neh 12:44 (Tanakh-JPS has “first fruits” and Tanach-Stone has “first-fruits”) and Ps 78:51 (Tanakh-JPS has “first fruits” and Tanach-Stone has “first fruit”).

Since *bikurim* and *raysheet* are two different Hebrew words with different connotations, it seems best to avoid using the translation “firstfruits” for *raysheet*.

There is no need to ever translate *raysheet* into “firstfruits”.

**Lev 23:10, “Speak to [the] children of Israel and say to them, ‘When you come into the land which I am going to give to you and reap its harvest / crop [7105 *ketseer*], then you shall bring [the] first [7225 *raysheet*] sheaf [6016 *omer*] of your harvest / crop [7105 *ketseer*] to the priest.’”**

In Lev 23:10 the phrase “when you come into the land” is often used in the special sense of “from the time that you come into the land onward”, not specifically “when you come into the land for the first time”. This is seen in the following examples: Lev 14:34; 19:23; 25:2; Nu 15:2; Deut 17:14; 26:1.

The portion of this verse prior to the word “**then**” is a unit of thought that relates to what happens every year after they first enter the land. The portion after the word “**then**” relates specifically to the wave sheaf offering. It must be admitted that this verse is not fully clear upon a casual reading and it requires much study. The word “reap” may be understood to begin with the wave sheaf offering. It does not imply that the time of the general harvest has arrived. It is a symbolic first sheaf.

**If Lev 23:10 would have had the Hebrew word *bikurim*, then it would show that the sheaf (*omer*) had grains in it that had attained a useful stage of growth.**

[37] Month of the Sheaf?

When the weakness of the use of *aviv* is understood from the hail plague, there is often a tendency among promoters of the use of barley to determine the first month to switch the emphasis of reasoning away from the word *aviv* toward the use of the wave sheaf offering. Such a shift in emphasis puts a great focus upon the sheaf, which has been discussed above. **The sheaf is an armful of stalks without specifying any degree of ripeness from the word sheaf.** This ceremony occurs shortly after the middle of the first month. If indeed the wave sheaf ceremony does have such a profound impact on the biblical calendar’s first month, then the name of the month should have been “month of the sheaf”, or *chodesh ha omer* rather than *chodesh ha aviv*. But the emphasis is on the word *aviv* in the way of referring to the first month. There is no biblical emphasis on the sheaf for identifying the month.

[38] Is there a command to search for *aviv*?

The phrase *chodesh ha-aviv* occurs twice in in Deut 16:1. That phrase should mean the same thing in both places within the same verse. Hence in its first usage in that verse it should not be interpreted to claim that it is a command to physically search for *aviv* to know that the first month is arriving. Deut 16:1 begins the same way that Deut 5:12 begins.

It is true that Lev 23:14 prevents eating of the new grain crop before the wave sheaf offering.

It is not true that Deut 16:9-10 prevents harvesting the new crop until the wave sheaf offering. Deut 16:9 is a difficult verse to understand because of the absence of Hebrew words where English words are added in italics, thereby introducing speculation.

[39] Meaning of Lev 2:14-16 which contains *aviv*

The following is my very literal painstaking translation from the Hebrew.

Lev 2:14, “And if you-offer a cereal-offering of firstfruits [= *bikurim*] to YHWH, you-shall-offer ears [= *aviv*] parched/roasted-grain with fire, [that is] fresh-grain [= *karmel*] crushed [for a] cereal-offering of your-firstfruits [= *bikurim*];

Lev 2:15, and you-shall-put oil upon-it and lay frankincense upon-it; it [is] an offering.

Lev 2:16, And the priest shall burn its-memorial-portion from its-crushed grain and from its-oil with all its-frankincense, an [offering by] fire to YHWH.”

This purpose of this passage is to explain how to offer a firstfruits offering of grain, regardless of what the grain crop is or what the month is. The use of *aviv* in Lev 2:14 is to be descriptive of what firstfruits of a cereal offering is, certainly not to define *aviv*. In this context the word *aviv* shows a later time of growth than in Ex 9:31-32. In the hail plague, *aviv* is not ripe, but here it is partially ripe or fully ripe. In this verse the Hebrew word *karmel* does not describe a degree of ripeness, but only that it is fresh, so that it is not stored from the last year. The document *Barley\_and\_Calendar.pdf* discusses the word *karmel* at great length. This is available at [www.BiblicalCalendar.org](http://www.BiblicalCalendar.org).

Here the farmer has an option of offering the firstfruits of any particular grain crop at a very early stage of usefulness or at a later stage when the ears are at a dryer and riper stage. Here the word *aviv* has a variation in stages of growth, but it must at least be capable of mashing or crushing into a cereal.

[40] Smith's Commentary on Exodus 9:31-32

This is a complete copy of W. Robertson Smith's reference (see the bibliography) except for a section written in Arabic for which Smith includes a translation that he puts in quotation marks shown in the published paper and which is copied below.

NOTE ON EXODUS IX. 31, 32

1. All over Egypt it is common to raise at least two crops of barley - *shitawi* and *seifi*. See Lane, *Modern Egyptians*, ch. xiv., from which it will be seen that the *seifi* or summer crop is sown about the vernal equinox or later, and so has no bearing on the text before us. Dr Grant-Bey of Cairo, who has kindly made a series of enquiries for me among natives and Europeans who know the country parts of Egypt, says however that in the Sharkiya district there are sometimes three crops of barley, and about Mansura and in the Gharbiya even four. What follows refers to the winter crop (*shitawi*).

2. The data of the harvest varies greatly in different parts of Egypt. From the Rev. Mr Harvey of the American mission Dr Grant got the following dates, applicable to the country south of Cairo:

- (a) The barley is in ear from the latter part of February to 15th March.
- (b) The flax is in flower from January 10th and in seed from February 15th.
- (c) When the barley is in ear the ears of wheat begin to form, but the grains are in a milky state.

The difference between upper and lower Egypt is about 35 days.

3. Rev. Dr Lansing of Cairo visited the region of Zoan in the first part of May, 1880, and found the farmers reaping barley while the wheat was nearly ripe. But he was told that the crops were at least a fortnight later than usual.

4. I have before me an Arabic letter to Dr Grant-Bey from a farmer in the district of Kalyub, a little north of Cairo. The following is a transcript of part of it.

[Arabic text appears here]

“The barley is in ear in the beginning of January, and the flax blooms in the middle of January, and the seed is found in it in the beginning of April. When the barley is in ear the wheat is green herbage; but the seasons vary as I told you.”

As the date when the flax blooms is almost the same in this statement as in Mr Harvey's it is plain that Mr Harvey is thinking of an earlier stage of the seed capsule, when he speaks of February 15th, than the native writer has in view when he says that the *bizr* or seed-grains are found in the beginning of April. On the other hand it is pretty plain that Mr Harvey's statement about the barley refers to the full ear, when harvest is about to begin. The letter of the native farmer gives what we want, for he speaks of the state of the barley when its ear is formed, but not that of the wheat. And at that time the flax is in flower, which appears to determine the sense of *gevol*.

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