Historical Departure from the Biblical Calendar, fifth edition

[1] Introduction

This document was written for four primary purposes. The first purpose is to explain the biblical basis for the use of astronomy to determine the biblical calendar, and specifically to show that the vernal equinox is a key marker for this calendar. The second purpose is to explain what Josephus meant by his most famous statement on the calendar. The third purpose is to outline what we can glean from history concerning the rule that became accepted by the Roman Catholic Church (= RCC) for the determination of the first month of the biblical year. One goal of the RCC was to determine the time of Easter, which fell during the second half of the first month. Focus here is on the Easter rule. The key person who was singled out by the church historian Eusebius to justify the conclusion of the RCC is Anatolius. A study of the reasoning and writing of Anatolius is significant for this document. The fourth purpose is to outline elements of the history of the modern calculated Jewish calendar and its calculation, summarized in chapters 27 and 41.

While these purposes may perhaps seem separated from one another, they are in fact related. Josephus used astronomical terms in his famous statement. Anatolius used Josephus to help formulate his Easter rule. Judaism eventually focused on an astronomical basis for their calculation, and although the specific language of the principle for the calculation of the Jewish calendar appears different from that of the Easter rule, when the terminology is stripped away, it will be seen that they are virtually the same. Nevertheless, the mathematics that supports the Easter rule is very different from the mathematics that supports the Jewish calendar.

Significant background material must be explained first in order for the presentation to be logically organized. Josephus cannot be understood without first explaining certain aspects of the history of astronomy.

[2] Egyptian Astronomical Science before Alexander the Great

Concerning the extremely high accuracy of aligning the largest ancient Egyptian pyramids with the east-west direction, and hence a precise knowledge of the time of the equinoxes by the ancient Egyptians, Neugebauer 1980 wrote on pp. 1-2, “It is therefore perhaps permissible to suggest as a possible method a procedure which combines greatest simplicity with high accuracy, without astronomical theory whatsoever beyond the primitive experience of symmetry of shadows in the course of one day.” A diagram and further discussion by Neugebauer explain how the Egyptians could have achieved the accurate alignments without any mathematically sophisticated theory. The reason he sought and proposed this method is simply that his studies into ancient Egyptian mathematics and astronomy did not hint at any Egyptian ability to accurately predict the time of the equinoxes.

Ronald Wells wrote a chapter titled “Astronomy in Egypt”, which concerns the time before Alexander the Great and his command to build the most modern city of ancient civilization, Alexandria, named after him. On p. 40 of this chapter, Wells provides the following summary: “Historians of science concede only two items of [astronomical] scientific significance bequeathed to us by the ancient Egyptians: the civil calendar of 365 days used by astronomers even as late as Copernicus in the Middle Ages, and the

division of the day and night into 12 hours each. These fundamental contributions may seem meager to many; engineering of the pyramids and surviving temples notwithstanding." P. 7 of this book edited by Walker states, "Ronald A. Wells was a Fulbright scholar in Egypt at the University of Cairo and at Helwan Observatory in 1983-4, and again at the Institute of Archaeology, Egyptology Division, University of Hamburg, in 1987-8."

Otto Neugebauer wrote (1945) on p. 11, "It will be clear from this discussion that the level reached by Babylonian mathematics was decisive for the development of such methods [for the numerical study of astronomy]. The determination of characteristic constants (e.g., period, amplitude, and phase in periodic motions) not only requires highly developed methods of computation but inevitably leads to the problem of solving systems of equations corresponding to the outside conditions imposed upon the problem by the observational data. In other words, without a good stock of mathematical tools, devices of the type which we find everywhere in the Babylonian lunar and planetary theory could not be designed. Egyptian mathematics would have rendered hopeless any attempt to solve problems of the type needed constantly in Babylonian astronomy." On p. 8 he wrote, "It is a serious mistake to try to invest Egyptian mathematical or astronomical documents with the false glory of scientific achievements or to assume a still unknown science, secret or lost, not found in the extant texts."

Neugebauer 1969 wrote on p. 78, "The handling of fractions always remained a special art in Egyptian arithmetic. Though experience teaches one very soon to operate quite rapidly within this framework, one will readily agree that the methods exclude any extensive astronomical computations comparable to the enormous numerical work which one finds incorporated in Greek and late Babylonian astronomy. No wonder that Egyptian astronomy played no role whatsoever in the development of this field."

From the many ancient texts of the Egyptians we conclude that they did not apply mathematics to astronomy before the time of Alexander the Great. After that time, the city of Alexandria was founded and the leading Greek mathematicians and astronomers settled in that city of Egypt, so that it became the world's leading center of Greek astronomy. But this was not part of ancient Egyptian culture; instead, it was the transplanting of Greek science and culture into Egypt by foreigners due to the newly constructed city of Alexandria with its modern marble streets and its grand marble museum that housed the greatest ancient library and some lecture halls. This famed museum became the best ancient equivalent to a modern university.

The attention devoted to ancient Egypt serves the purpose of showing that ancient Israel could not have obtained knowledge of mathematical astronomy from Egypt because Egypt did not possess knowledge of mathematical astronomy.

[3] Did Ancient Israel Excel in Advanced Mathematical Astronomy?

Did ancient Israel use a positional digit system with a zero, which would enable rapid multiplication and division as needed in mathematical astronomy? On p. 26 of GKC2 (the latest English edition of the Hebrew grammar book by Gesenius as revised by others), the numerical value of the 22 Hebrew letters is presented. This shows one letter for the value

2, another letter for the value 20, and another letter for the value 200. This illustrates the nature of the symbolic number system in ancient Hebrew, and shows that it was not a positional digit system with a zero. P. 30 has further comments on this system, which was used on coins in Judea from the Maccabean period (c. 150 BCE). The time of the origin of this system is unknown. This system would be a hindrance for general long division and is not useful for mathematical astronomy.

On pp. 58-59 of Schniedewind 2013, he wrote, "The influence of Egyptian scribal culture would become widespread in early Israel. In addition to learning the practices of accounting (that is, using hieratic [= Egyptian] numerals) and of writing with ink, the early Israelites borrowed several linguistic terms relating to the scribal profession from Egyptian." On p. 101 he wrote, "Excavations at Kadesh Barnea (Tell el-Qudeirat) have recovered some of the best examples of scribal exercises in ancient Judah. Kadesh Barnea was a remote fortress that served trading caravans in the middle of the vast Negev highlands. The excavations recovered ten ostraca dating to the late monarchy. Ostraca 1-6 and 9 date to the last phase of the Iron Age fortress (ca. 600 B.C.E.) and appear to be scribal exercises. The most elaborate example includes six columns with lists of hieratic numbers as well as hieratic abbreviations for accounting terms such as *shekel* and *homer*." The use of these Egyptian numerals in Israel during the monarchy before the Babylonian exile shows the lack of a positional numbering system with a zero, and hence the lack of general methods of long division that would be needed for mathematical astronomy.

The ancient Israelites from the time of Moses in Egypt could not have borrowed mathematical astronomy from Egypt because Egypt did not possess mathematical astronomical knowledge until it was brought there by Greek astronomers more than 1000 years after Moses died. From biblical chronology I estimate that the Israelite exodus from Egypt occurred c.1480 BCE, although some scholars want to date this c. 1250.

Ptolemy wrote his great works of astronomy c. 150, which included the *Almagest*, originally known as the *Syntaxis*. After some discussion concerning the practice of astrology in the writings of Ptolemy, on p. 207 Cuomo 2001 summarizes as follows, "In sum, Ptolemy upholds the value of astrology, which had come under many attacks, by emphasizing its links with mathematical knowledge (of the kind expounded in the *Syntaxis* and condensed in the *Handy Tables*) and its value for the pursuit of a happy and tranquil life. At the same time, he restricts the field of those who can practice it to thoroughly-trained people who are not only interested in their own gain." In other words, Ptolemy wants the experts in mathematical astronomy to be able to meet their financial needs through astrology.

The most detailed biblical context against astrology is Isa 41:21-24. Verse 23 is a challenge and a sarcastic taunt to others who would seek to predict human events, "Declare the things in [the] future that we may know that you are gods ..." Devout Jews should be expected to avoid astrology, and this would seriously dampen their interest in mathematical astronomy because of its association with astrology in ancient times.

Although the Jews were in captivity in Babylon where the pagan priests had an advanced knowledge of mathematics, mathematical astronomy, and astrology written in the complex Akkadian language with its hundreds of symbols for words (not for numbers), there is no evidence that these Jews mastered Akkadian and acquired this knowledge of mathematical astronomy, and in fact there is evidence to the contrary from numerals on Israelite coins after the return from captivity. The barriers of the Akkadian language (no longer in common use in Babylon), astrology, and paganism would have deterred Jews from pursuing the major effort to duplicate Babylonian mathematical astronomy.

Philo of Alexandria (c. 20 BCE – c. 50 BCE) lived within a wealthy Jewish family that enabled the best education that one may desire. He was well educated in the Greek tradition of Alexandria, the leading city of scientific achievement in that era, although active Babylonian astronomy did not fade away until about the middle of the first century. Philo wrote extensively about biblical matters and philosophy from a Jewish viewpoint, yet he injected some Greek philosophy as though it was part of Judaism. Philo refers to astronomers on p. 2 of Philo_QE (Exodus, Book 1.1). On p. 2 he wrote, “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.”

The military success of Alexander the Great with his political achievement many years later resulted in the transfer of certain advanced astronomy from the Babylonian astronomer-astrologers to Greek astronomers c. 150 BCE, and the four cardinal points of the solar year known as the two equinoxes and the two solstices were prominent in Babylonian astronomy. To Greek astronomers the vernal equinox was the beginning annual point of the sun's cycle, and the Ram is the name given to the beginning sign of the twelve signs of the zodiac. Philo's wording in the quotation above indicates he does not count himself among those learned in astronomy, yet he was well educated. The branch of science known as mathematical astronomy in Alexandria was a specialized area of higher education that was not part of the training of a typical well educated person. There was no practical means of earning a living through a knowledge of mathematical astronomy unless one sought income through teaching the subject or through astrological predictions, and perhaps both. In each generation of early Alexandria only a small number of people would be motivated to become knowledgeable in mathematical astronomy.

The Jewish writing known as I Enoch chapters 72 – 82 presents a solar calendar of 364 days in a year. This may date from roughly 200 BCE. Glessmer 1996 shows that the seasonal shadow lengths during daytime in the astronomical chapters of I Enoch are very similar to the seasonal shadow lengths during daytime in the Babylonian documents of MUL.APIN dated hundreds of years earlier, and both of them employ an upright stick (called a gnomon) in the center of concentric rings drawn on a flat ground surface. This is based upon water clock measurements and does not require advanced mathematics. On p. 260 Glessmer wrote, “This implies that some countings and digits cannot be avoided, but no 'higher mathematics' is presupposed”. This gnomon concept is similar to an ancient bowel-shaped artifact that was discovered in the region of the Judean desert from which

the Dead Sea Scrolls are known. A gnomon may be used to determine the day of the vernal equinox.

Ancient Jewish writings from the Dead Sea Scrolls, from Philo, from Josephus, from archaeological artifacts, and from the Mishnah (c. 200 CE), give no hint that the Jews became familiar with the Babylonian or Greek mathematical methods of computation before the time of the Greek astronomer Ptolemy (c. 150 CE) who lived in Alexandria, Egypt. The Talmud does claim that Mar Samuel was able to compute a calendar for many years in advance, c. 250 CE, although none of the details are known.

Jewish scholars do not claim that the ancient Israelites had abilities in mathematical astronomy that equaled that of their ancient neighbors. There is no historical evidence for it. On pp. 555-556 of Langermann we find, “Although the sun, moon, and stars are mentioned in the Hebrew Bible, that ancient and sacred text does not display any sustained exposition which can be called an astronomical text. Ben-Dov 2008 is a good source for the Dead Sea Scrolls on this lack of mathematical ability by the Jews in Palestine in the first century. The earliest sources for a Hebrew tradition are found in a few passages in the Talmud and Midrash [c. 200-600 CE].”

The Babylonian Talmud, specifically the section designated Rosh Hashanah 25a (RH 25a), which is on p. 110 of BT-BEZ-RH, quotes Rabban Gamaliel II of Yavneh as having said, “I have it on the authority of the house of my father's father [Gamaliel the Elder from the early first century] that the renewal of the moon takes place after not less than twenty-nine days and a half [day] and two-thirds of an hour and seventy-three halakin.” Since there are 1080 halakin in one hour, this is 29.5 days 44 minutes 3 1/3 seconds. Thus RH 25a claims that from one new moon to the next new moon is at least this length of time. On p. 308 of Swerdlow 1980 this is shown to exactly equal the value used by the Greek astronomer Hipparchus (c. 190 - c. 120 BCE) for the average length of the month, which he wrote in the base 60 as 29;31,50,8,20 days, which equals 29 + 31/60 + 50/(60x60) + 8/ (60x60x60) + 20/ (60x60x60x60) days. But did Hipparchus derive this value himself? No! This came from Babylonian System B. On pp. 168, 240-241 of Hunger and Pingree it is stated that this length of an average synodic month comes exactly and directly from column G in the Babylonian lunar System B, and on p. 236 this book states that the earliest tablet containing System B material from Babylon is dated 258 BCE. Hence this number was derived by the Babylonians some time before 258 BCE. On p. 54 of Britton 2002, John Britton estimates the origin of the mean synodic month to c. 300 BCE.

How might ancient people determine the length of a lunar month? By taking two widely separated eclipses of the same kind and when the moon is traveling at about the same point in its cycle of varying velocity, and then dividing the time length between them by the number of lunar months, one may estimate the average length of a synodic month. Hipparchus was trying to compute eclipse periods, and for this purpose he used two old records of eclipse observations from Babylon that he possessed as well as two eclipse observations from his own lifetime. From these two pairs of eclipses Toomer's paper explains that a computation of the average lunar synodic month would in fact disagree with the number that he received from Babylon, but Hipparchus accepted their number

anyway. The last of the base 60 numbers above is 20, but the computation from Hipparachus' eclipse records would instead round off this last number to a 9. While the long division computation gives a different number, the difference between these values is less than a tenth of a second! How accurate are these numbers (20 and 9 for the last place) compared to the true value of the average lunar synodic month near the time of Hipparchus and the earlier Babylonians?

On p. 87 of Depuydt 2002, Leo Depuydt provides the following estimated modern computations for the mean synodic month in the years 2000 BCE, 1000 BCE, and 1 CE, and I have converted these to the Babylonian base 60 system. The computed estimated time is based upon eclipse records going back to 747 BCE and the assumption that the trend continued in a similar way prior to that date.

2000 BCE 29d 12h 44m 2.08s = 29; 31, 50, 5, 12

1000 BCE 29d 12h 44m 2.29s = 29; 31, 50, 5, 43.5

1 CE 29d 12h 44m 2.49s = 29; 31, 50, 6, 13.5

Compare the above modern computed lengths of the mean synodic month through time with that of the Babylonians and the Greek astronomer Hipparchus below.

Babylonians c. 300 BCE = 29; 31, 50, 8, 20 (also the Talmud)

Hipparchus' data c. 150 BCE = 29; 31, 50, 8, 9

We have seen that the Babylonian Talmud, which was released by Jewish scholars c. 600 CE, uses the exact time length of a mean synodic month that originates from ancient Babylonian astronomers at roughly 300 BCE, yet the Talmud refers back to the house of Gamaliel in the first century for this figure. Is it reasonable to think that some Israelites derived this time for the average length of a lunar month independently on their own? No it is not, because this number is slightly under one second too large based upon the above data. The use of different eclipse records for a computation ought to give a different result. The paper by Toomer points out that the Greek astronomer Ptolemy of Alexandria c. 150 CE wrote about the achievements of Hipparchus 300 years earlier, and both of them realized that picking a different pair of eclipses from which to compute the average length of a lunar month would provide a different result. Ptolemy discussed the specific nature of which eclipse records would likely produce a more reliable result, and he based this on the earlier work of Hipparchus. The reason for the use of different eclipses producing a different result is that the apparent speed of the moon as observed from the earth varies at different times of the month, at different times of the year, and at different times of the eclipse cycle known as the Saros, which is 223 mean synodic months (18.03 years). Thus any computation based upon a specific pair of eclipse observations will result in a unique value for the average length of a lunar month, although properly chosen records will provide close results.

The Babylonians began predicting the visibility of the new crescent at roughly the year 450 BCE, and this prediction is based upon an accurate understanding of the moon's cycle for repeating its speed variation, or lunar anomaly, within the Babylonian System A (see the paper by Britton 1999, especially p. 244). The cycle of lunar anomaly is the

Saros cycle. From roughly this time onward they would be in a good position to be able to judge which pair of eclipse records should produce an accurate figure for the average lunar synodic month. As stated above, the oldest existing Babylonian System B material is dated 258 BCE, and this system includes the fundamental parameter that Hipparchus used for the mean synodic month, which was championed by Ptolemy c. 150, and was later incorporated into the Babylonian Talmud c. 600. We have no explicit knowledge of exactly when or exactly how this length of the mean synodic month was determined within System B by the Babylonians, although it is a very reasonable conjecture that some pair of eclipse records from the same part of a Saros cycle was a key. On p. 45 of Britton 2002, John Britton estimates the origin of System B to be as early as c. 330 BCE, but on p. 54 his estimate for the origin of the mean synodic month is c. 300.

Pp. 13 and 22 of Spier show that the modern calculated Jewish calendar uses the approximation for the average length of a month from RH 25a in the Babylonian Talmud, yet we now know that this came from ancient Babylonian astronomers c. 300 BCE. The Babylonian Talmud is called "Babylonian" because its Jewish authors lived in Babylonia at the time of its publication c. 600 CE, not about 900 years earlier when the Babylonian astronomers derived this figure. But other factors are also used for the modern calculated Jewish calendar, which are not due to either ancient Babylon or Hipparchus, and are not found in the Talmud. Num 10:10 shows a responsibility of the Aaronic priesthood in declaring the "beginning of the months", and thus control of the calendar and its knowledge could be expected to have been passed down from generation to generation via the hereditary priesthood. However, after the Temple was destroyed in 70 CE the Aaronic priesthood vanished from Jewish history along with its influence over the calendar. No writings from this priesthood have survived from before the destruction of the Temple, except for the fact that Josephus was a priest who was born in 37 CE and died c. 100. While his writings exist, none of them were written before the destruction of the Temple, and he does not discuss when a month begins in any direct way. He never mentions any astronomical calculations being done by the ancient Jews, and neither does Philo of Alexandria (c. 20 BCE - c. 50 CE).

In order to perform the mathematical computations for general long division of fractional numbers that would be necessary for predictive astronomy, it would be necessary to utilize a number system with a base, which would therefore enable a positional notation and the use of a symbol for zero. For computational uses without a computer, modern society uses the base 10 for ordinary purposes, although modern computers use the base 2, and for the sake of human ease of readability, the base 2 is typically converted to base 16 (hexadecimal) for computer professionals. The Babylonians and Greeks used the base 60 number system for their capable calculations. After the achievements of the Babylonians and Greeks in the Eastern Hemisphere, the Mayan Indians in the Western Hemisphere used the base 20 number system. Evidence given above shows that the ancient Israelites did not use a positional number system with a base and a symbol for zero. They could not have employed advanced mathematical astronomy in ancient times

The ancient pagan Babylonian priests were interested in astrology. They predicted the future of kings and kingdoms. They gained wealth and political prestige through this

practice until Daniel told both the dream and its interpretation to the king (Daniel 2). They then lost political prestige, but their pagan practices continued as they developed the techniques of horoscopes. Some of these pagan priests were the predictive astronomers. Their desire for wealth and prestige led to their efforts at computational and predictive astronomy. The Greeks had a greater interest in science for the sake of knowledge, although they too were interested in astrology and its use to gain wealth. The leisure time to devote to astronomy came from the wealth gained by astrology.

The difference in time between the computed average time of the conjunction (based on repeated additions of the average synodic lunar month, which is employed in the modern calculated Jewish calendar) and the true conjunction is about 14 hours according to p. 45 of Wiesenberg 1971. Thus the modern calculated Jewish calendar is not based upon predicting the true conjunction. The Jews at the time of Moses were not using the modern calculated Jewish calendar with its adoption of the Babylonian length of the average month, and they were not able to calculate the time of the conjunction.

[4] A Month is a Cycle of the Moon

I Ki 6:38, "And in the eleventh year in the month [3391 *yerach*] Bul, it [is] the eighth month [2320 *chodesh*], the house was finished for all its parts and for all its plans, [and] thus he built it seven years."

I Ki 8:2, "And all the men of Israel were assembled toward King Solomon at the feast in the month [3391 *yerach*] Ethanim, which [is] the seventh month [2320 *chodesh*]."

Strong's number 3394 for moon (*yahrayach*) and Strong's number 3391 for month (*yerach*) have the same three Hebrew consonants and look the same when the vowel points are removed. In the Hebrew language the 22 letters shown in the sections of Ps 119 are called consonants even though some of them act as vowels. The original Hebrew text of the Scriptures only had these 22 consonants. The vowel points (and some such marks are more than points, but that is the term by which they are called in Hebrew school) were added to aid pronunciation by the Masoretes about the year 650. This identical original appearance in the Hebrew word for moon (3394) and this Hebrew word for month (3391) shows that a biblical month is based upon the moon. These verses, I Ki 6:38; 8:2, also have another word for month [2320 *chodesh*], and it shows that the two different words, *yerach* and *chodesh*, indicate the same thing, a month.

Ps 104:19, "He made the moon [3394 *yahrayach*] for appointed-times [4150 *moed*], the sun knows its going-away."

Ps 104:19 and Gen 1:14 both have the plural of the Hebrew word *moed* within them, and both show an astronomical context. Gen 1:14 points to unnamed heavenly bodies that emit light and that are responsible for determining the appointed-times (Hebrew *moed*). A single ray of light is called a photon. While the moon does not originate the photons of light that come from itself to the earth, nevertheless an observer on the earth does see photons of light that come from the moon to the eye. Photons travel from the moon to the earth, so the moon does qualify as a candidate to be one of the lights that are the subject of Gen 1:14.

Among the 222 places in Scripture where *moed* occurs, 40 of them are in a context showing the festivals, the Day of Atonement, or the Sabbath. Lights in the heavens have a cyclical pattern, and the festivals, the Day of Atonement, and the Sabbath have a recurring pattern. No other type of context with *moed* fits Gen 1:14. We have already seen above that a month is a cycle of the moon. Ps 104:19 strengthens the direct evidence seen above, connecting a cycle of the moon with the biblical month. Thus the word *moed* in Gen 1:14 must refer to the festivals, the Day of Atonement, and the Sabbath.

Ps 104:19 does not have the word "all". It does not say "for *all* appointed-times". If it did have the word "all", it would even appear to somehow make the Sabbath depend on the moon.

The moon has a repeating cycle of slightly more than 29.53 days. Some pattern of cyclical light from the moon must begin a month based upon the above Scriptures.

One plausible reason that the two different words for month, *yerach* and *chodesh*, occur in both the Hebrew and the Ugaritic languages (with the Hebrew borrowing these words from the Ugaritic) is that at some time in the past two languages were spoken in an overlapping region of the eastern Mediterranean Sea and one of the languages used the word *yerach* and the other language used *chodesh*. Both words were adopted in the same region. Eventually one of the two languages largely became extinct, but some words of both languages survived. Since there are no written records to prove such a plausible theory, it is only a theory. Many ancient languages never had a written form so that when such languages became extinct, there was no record that they ever existed.

Some readers of this document may be Jews who do not accept the New Testament. Such readers may skip the reasoning used in the remainder of this chapter.

Luke 2:41 [NKJV], "His parents went to Jerusalem every year at the Feast of the Passover.

Luke 2:42, And when He was twelve years old, they went up to Jerusalem according to the custom of the feast."

I Pet 2:22 shows that He committed no sin, which shows that during His years of youth He kept the festival of Passover with His parents on the correct dates, and thus the calendar used by the priests who officiated at the Temple in Jerusalem was the correct calendar.

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 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.

Another followup to the same thought based upon Luke 2:41-42 is that Philo wrote that the Passover began on the 14th day of the month when the moon was full. Philo also wrote that the month begins with the first sighting of the moon after the conjunction. This is combined evidence that the biblical month began approximately opposite the full moon.

[5] Full Moon occurs about the 14th and 15th Days of the Biblical Month

The end of the last chapter already provided some evidence that the full moon occurs about the 14th and 15th days of the biblical month. This chapter provides a very different method of evidence.

When Abraham departed from Haran and permanently moved to the Promised Land, the language of his environment changed from Akkadian to Canaanite. He was accompanied by a few hundred people who were essentially his servants. During a span of a few hundred years the Akkadian language that this small group with Abraham spoke gradually changed to a form of the Canaanite language because they were greatly outnumbered by Canaanites in their midst. Just to the north of the Canaanites, and even blending with them was the Ugaritic Kingdom. Thousands of ancient documents written in the Ugaritic language have been discovered and translated since their discovery in 1929. The vocabulary of Ugaritic and ancient Hebrew is almost the same.

Scholars who know biblical Hebrew have no problem understanding ancient Ugaritic. Words that are the same in two closely related languages such as biblical Hebrew and ancient Ugaritic, and that appear in the same contexts are called cognate words, indicating that they have the same meaning in both languages. When the ancient Hebrews borrowed words from their neighbors and accepted them into their own language, the meaning was obviously borrowed along with the word, although over much time ancient Hebrew did modify or expand the meanings of some of its words. However, technical words are not expected to change in their technical meaning.

Both of the Hebrew words that mean month, namely *yerach* and *chodesh*, also occur in the Ugaritic language, and they are cognates, indicating that their month and the Israelite month began the same way. We can learn some of the meaning of these words in ancient Hebrew through one clear context in ancient Ugaritic. In one Ugaritic text dated c. 1300 BCE (the period of the Judges, between Joshua and King Saul), the written day of the month is numbered 14, along with subsequent discussion that may indicate the next day, appears. On pp. 232-233 of Olmo Lete 1999 we read, “In any case, this is the only indication of *time* for the ritual act: the 14th-15th day of the month, *ym mlat* (lit. 'day of

fullness')." This same Ugaritic text is also discussed in more detail on pp. 20-21 of de Tarragon 1980. On p. 18 de Tarragon discusses the Ugaritic expression "*bym hdt*" [= in day *chodesh*], using only consonants because there are no vowels just as with ancient Hebrew, where the dot under the first "h" indicates the first letter of the Hebrew *chodesh*. His comment on p. 18 about this Ugaritic expression (using my translation from his French) is, "It designates the new-moon, the day of the new moon." He says this expression occurs ten times among a few Ugaritic texts that he studied. Hence the Ugaritic cognates that were borrowed into the Hebrew shows that the full moon occurs about day 14-15 of the *chodesh*.

This Ugaritic text involving the full moon **defeats** the theory that the ancient biblical month before the Babylonian captivity **began** with the day of the full moon. Those who champion this theory that the biblical month begins with the full moon argue for it on the basis of an interpretation of Ps 81:3.

The use of the cognate words of *yerach* and *chodesh* in both Ugaritic and Hebrew is clear evidence that a cycle of the moon determines a biblical month. The above example shows that the moon looks roundish about day 14-15 of the *chodesh*.

[6] Ps 81:3 shows that the Moon's Cycle determines a Biblical Month

(A) Full Moon occurs in this verse

Ps 81:3, "Blow at the new moon, [the] ram's horn, at [the] full moon, on our feast day."

The above highly literal translation sticks very closely to the Hebrew word order. The Hebrew word for "and" does not occur in this verse. Ps 81:3 mentions the new-moon (= *chodesh*) and the full-moon (= *keseh*). The end of this verse shows that at least there is a feast day on the full moon at some time of the year. The Hebrew word *keseh* for the full-moon is certainly a reference to the moon when it is roundish, but not necessarily at the most precise moment of fullness. Philo of Alexandria calls both the fourteenth and the fifteenth days of the month the time of the full moon. The meaning "full-moon" for *keseh* is based upon cognate words in the Phoenician language, the Akkadian language, and especially in the Syriac language. This is also based upon Aquila's translation from Hebrew into Greek and Jerome's translation from Hebrew into Latin. The Syriac Peshitta also shows this meaning. The form of the Hebrew word *keseh* with the Hebrew prepositional prefix *bh* shows that it cannot be a verb that means "to cover". Hence Ps 81:3 does indicate that a biblical month is based upon a cycle of the moon.

Based upon the adoption of the Canaanite language by the descendents of Abraham (eventually the Israelites), the previous chapter shows that Ps 81:3 cannot be interpreted to mean that *chodesh* (for start of the month) equals *keseh*. In other words, the month does not begin with the full moon. The grammar itself in Ps 81:3 is ambiguous concerning whether *chodesh* and *keseh* should refer to the same thing.

(B) Grammatical Structure of Ps 81:3 compared with other Psalms

Three verses from the Psalms will now be presented that have a sentence structure similar to Ps 81:3 to show that the reader need not insist that the full moon defines the new moon based upon the grammar of this verse. Hence it is permissible to understand that the word

“and” is implied in the translation in order to give the correct sense to the reader. In poetry, normally expected words may need to be supplied in translation. The sentence structure of Ps 81:3 has the following three characteristics:

(1) The Hebrew word for “and” does not exist in the verse.

(2) The Hebrew has two or more prepositional phrases with the same preposition.

(3) Only one verb occurs, and this precedes the prepositional phrases.

These characteristics apply to the following three verses, all translated according to YLT because it preserves the Hebrew sufficiently to note the grammar.

Ps 13:2. “Till when do I set counsels in my soul? Sorrow in my heart daily?” Here “soul” and “heart” are not identical. The phrases are not synonymous.

Ps 50:9, “I take not from thy house a bullock, From thy folds he goats.” Here “thy house” and “thy folds” are not identical. The phrases are not near synonyms.

Ps 116:8, “For Thou hast delivered my soul from death, My eyes from tears, my feet from overthrowing.” Here “death”, “tears”, and “overflowing” are not identical. The phrases are not near synonyms.

These poetic examples show that the two prepositional phrases in Ps 81:3 need not be synonyms on the basis of the grammar. This defeats the allegation that some people make that the biblical month begins with the full moon based on this verse.

[7] The Month in Israel began Correctly after the Babylonian Captivity

Using the conjunction (astronomical new moon) to start the month is contrary to the biblical emphasis and stress on the use of visible ***light*** to determine the appointed times. Some advocates of the conjunction theory for the beginning of the month claim that before the Babylonian captivity under Nebuchadnezzar, ancient Israel (specifically the House of Judah) determined the start of a month with the sundown that began a day, but the moon was invisible near that sundown. These people go on to claim that after the return from captivity under Ezra and Nehemiah, Israel, under the influence of the Babylonian calendar and Persian political dominance, no longer continued the alleged original practice of using the conjunction since the time of Moses. To judge the rationality of this view, let us read a couple of verses from Neh 8.

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.”

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, it must have been determined correctly, and this was after the return from the captivity under Ezra and Nehemiah. Hence they could not have adopted a pagan practice contrary to what was correct under the law as taught by Moses. The Aaronic priesthood had the proper pattern to determine the start of a month set in motion from this day

onward down through the later centuries until the Temple was destroyed in 70 CE, and there is no known time during which the priesthood is thought to have had any significant doctrinal upheaval in its own ranks during this period.

[8] Astronomical Simplicity of the Biblical Calendar and Keeping Passover Centrally

Gen 1:14 points to the "light-bearers in the heavens" to determine days, appointed-times, and years. Here the translation "appointed-times" comes from a plural form of the Hebrew word *moed*, which is frequently translated "seasons", although the latter is misleading because it may give the mistaken impression that it refers to the four annual seasons of summer, fall, winter, and spring. The only appointed-times (*moed*) mentioned in the Bible that relate to the cyclical movements of the visible heavenly bodies (directly and literally mentioned in Gen 1:14) are the festivals and the Sabbath, from Lev 23, where the use of *moed* occurs multiple times in the plural. This implies that the beginning of the months are included in Gen 1:14 because they are needed to know when the festivals occur.

The Hebrew word *chodesh* means new-moon or month. The Hebrew word *chadash* means "new" or "renew" as a noun or a verb. Before vowel points were added to the Hebrew text, the words *chodesh* and *chadash* looked identical. This indicates that the moon, when it begins a month, is in some sense "new". A cycle of the moon shows it to first be invisible from one to three days, then to be visible as a narrow crescent (the new crescent), then to get fatter each day until it becomes round. Then is gets thinner, and finally it again becomes invisible. It is common sense that this cycle exhibits the idea of newness when it first becomes visible after the period of invisibility. Gen 1:14 shows that ***light-bearers*** are to determine appointed-times. This indicates that the new crescent begins a month and is the new-moon.

The moon's orbit is not a circle in its travel around the earth; it has the path of an ellipse, and the earth is not in the center of the ellipse. The angular speed of the moon in its travel around the earth is not constant because it travels faster as it gets closer to the earth. This makes the mathematics of predicting the position of the moon in its orbit around the earth especially difficult. The time from the exact full moon to the next conjunction is rarely equal to the time from the conjunction to the next exact full moon. The difference between these two times can be about 49 hours! Hence the next conjunction cannot be known simply by knowing the time of the full moon. An ancient calculation of the astronomical new moon, called the conjunction, would not have been possible at the time of Moses without mathematical astronomy, which ancient Israel did not have. Since the period of invisibility of the moon during each moon cycle will last from one to three nights, unless there is a calculation, the night of the conjunction could not be known by any simple method. The belief that ancient Israel began its month with the conjunction may be an attractive theory because modern computers can inform us of the exact time of the conjunction, but this could not have been used at the time of Moses because of the impossibility of an ancient computation for this upon recognizing that the history of ancient astronomy and mathematics rules out such a computation.

The Babylonian month names were accepted by the Jews in their calendar at some time after 499 BCE. From that year onward the Babylonian calendar did not allow the first day of its first month to occur before the vernal equinox. Before that year the Babylonian first month wiggled wildly with respect to the vernal equinox. The ancient Babylonian calendar began its months with the sighting of the new crescent.

Astronomical reality shows that the new crescent is seen in the western sky near the time of sunset. From Scripture the new=moon was only officially declared by the blowing of two silver trumpets by priests (Num 10:1-10), so that the authority of the priesthood was part of the biblical process.

A biblical day is a nighttime followed by a daytime. The transition from light to dark begins a biblical day. This transition of light is a light trigger.

A biblical month begins with the sighting of the new crescent, which is also a light trigger.

Similarly, we should seek a unified and comprehensive expansion based upon Gen 1:14 for the start of a **year**, the last word in Gen 1:14.

Probing into Gen 1:14 with regard to its last word *years*, what could the lights in the heavens involve for years? Candidates include the sun, moon, stars, planets, and comets. The fact that the Feast of Tabernacles relates to a time literally described as "*in your gathering of the produce*" (the Hebrew does not actually have a past tense for this in Ex 23:16; Lev 23:39; Deut 16:13), implies that the biblical year closely approximates the agricultural year, so that the long-term average length of the biblical year is the same as the ordinary tropical year, which is about 365.2422 days. This eliminates the planets and comets from consideration for *years*, because their pattern of visibility has no relation to the period of the tropical year. In fact this also rules out the stars because the phenomenon described in astronomy books under the name "*precession of the equinoxes*" causes the time of the visibility of the constellations (certain star clusters that were given names) to advance 14.1 days for each 1000 tropical years. With the elimination of the stars, planets, and comets, only the sun and moon are left to consider. The moon determines the start of the months, but it does not determine which month is the first month. By process of natural elimination, the sun must be involved for the determination of years from the literal and direct viewpoint of Gen 1:14.

The previous paragraph mentioned the phrase "*in your gathering of the produce*", and it listed the three places where this phrase occurs. The significant crops that are harvested at that general time of the year (this time is to be approximated later) are figs, grapes, and olives. Figs in Israel are harvested from July to September. Grapes in Israel are harvested from August through early November. Olives in Israel are harvested in September and October. Hence the phrase "*in your gathering of the produce*" is very elusive and non-specific because that time period is a lengthy blur. In this context one must conclude that this phrase is merely intended to be a rough approximation. Unless clear evidence can be presented, only the general approximation of crop indicators in association with festivals makes sense. Gen 1:14 is specific in mentioning "*light-bearers in the heavens*" for the

determination of the plural of *moed*. These light-bearers are capable of determining precise times.

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, and this is accompanied by the appearance of the stars at night, specifically noted in Ps 136:9; Jer 31:35. (The moon's appearance or non-appearance occurs at different times of the night depending on what part of a month is present.) The light trigger for beginning a new month is the new crescent in the western sky near sunset. 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) no advance prediction is needed. We should expect these two characteristics of a light trigger to apply to the determination of *years*. This continues the pattern.

We need to consider a light trigger at (or shortly before) the event of a new year, and there should be no need for advance prediction. 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.

In Jer 36:22 we find, "Now the king was sitting in the winter house in the ninth month, with [a fire] burning in the brazier before him." This shows that the ninth month occurs in the winter. Since there are roughly three months per season, if we go backwards from the winter that approximates the ninth month, 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 and the word *years*.

Therefore, from Gen 1:14, along with some helping Scriptural clues as time markers of the approximate tropical year, we note that the vernal equinox must be the trigger of light

from the sun that points to the new crescent that begins the first month. Next, consider why the vernal equinox must occur at or shortly before the first new crescent to fulfill the pattern and avoid advance prediction. For example, let us suppose that someone proposes that the first new crescent is the one for which the 15th day of that month is on or after the vernal equinox. That 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, long distance travel over hilly land (Deut 11:11, and Jerusalem is about 2500 feet above sea level), etc. 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. If the 15th day needs to be compared to the vernal equinox to determine whether it is the first month or the 13th month, then advance prediction is required at the beginning of the month to know how to compare the 15th day with the vernal equinox that is yet future.

This concept of using the 15th day of the first month to compare to the vernal equinox is in fact a close approximation to the **Easter rule** of the Roman Catholic Church (RCC). Historically the **Easter rule** compared the vernal equinox with the 14th day of the lunar month, which it assumed would always be the time of the full moon for mathematical simplicity. They sought mathematical simplicity, a repeatable pattern, not precise astronomy. The actual mathematics for the early use of the Easter rule has not survived. Those with responsibility in the RCC eventually assumed that the Julian calendar year of 365.25 days that was used by the Roman Empire was astronomically sufficiently correct to know the calendar date of the vernal equinox, although the more advanced Greek astronomers in Alexandria knew this was not precise. The accumulated error of the true vernal equinox with the Julian calendar year eventually led to the RCC's replacement of the Julian calendar with the Gregorian calendar in 1582, and its use by secular society continues today.

From a Scriptural standpoint this Easter rule does not make common sense because of this rule's need to embrace advance prediction in the context of the culture of ancient Israel. ***It breaks the pattern in Gen 1:14 for the new day and the new month*** *(*the latter is implied from Ps 104:19 with calendric data in Lev 23 using the unifying word *moed* running through them all including Gen 1:14*)*, ***both of which begin with a new light trigger and no advance prediction.*** Hence this proposed type of Easter rule is out of harmony with Gen 1:14. Although one may argue that only the educated priesthood had to determine in advance such a proposed future prediction, that does not alter the problem in a near borderline case for the vernal equinox. Gen 1:14 literally speaks of the “lights in

the heavens" (or even more precisely, the "light-bearers in the heavens"), not "predicted lights in the heavens", whether by marks on the ground or by mathematics.

The conclusion is that the new crescent that occurs on or after the vernal equinox is the one that 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 utilizing the Hebrew word *moed*. This is the simplest method that makes common sense.

The use the of vernal equinox comes from a recognition that: (1) Gen 1:14 is an astronomical context containing the word year; (2) Only the annual pattern of the sun can provide the needed astronomical trigger; and (3) The only annual sign of the sun at the appropriate time of the year is the vernal equinox. Other corroborating factors that correlate with Scripture will also be presented. The meaning of the biblical vernal equinox remains to be explained.

[9] Astronomy and *tkufah*

It is natural for the reader to request explicit biblical evidence that the vernal equinox is mentioned in the Bible. Plausible indirect 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. Soon other evidence will be presented. This later evidence is specific and strong, but each piece in the jig-saw puzzle must wait its turn, and none is very brief to explain. At this point, a Hebrew word that is controversial among some people will be discussed.

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 Chr24:23. 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 equinoxes and solstices according to the Dead Sea Scrolls as well as according to its use in Scripture.

[10] 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 Chislev 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. I**f 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.

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

In southern Egypt, the Persian Empire controlled the city of Scyene and the military base on the island of Elephantine where ancient documents have been discovered with events dated in both the Egyptian civil calendar and the Babylonian calendar. 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 the Babylonian calendar was used in Scyene and Elephantine.

In Neh 13:30 the words of Nehemiah are, “Thus I purified them [the people in Judah] from everything foreign...” 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.

One of the Aramaic letters found at Elephantine is known in scholarly circles today as the Passover Papyrus. The Hebrew-Aramaic alphabetic characters in this letter along with an English translation are found on pp, 56-57 of Lindenberger. In the following quotations from the letter, the square brackets and the contents within them appear on p. 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 p. 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 p. 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. Since the Babylonian calendar at that time in history began its first month on or after the equinox, the same should apply to the Jewish calendar at that time.

This ancient letter takes it for granted that Nisan to the Jews on the Persian military base (the Nisan of the Babylonian calendar) was the same Nisan that was used in Jerusalem.

[12] The Solar Calendar of the Book of Jubilees and the Book of Enoch

See the document DSS.pdf.

[13] Biblical Meaning of the Vernal Equinox

What is the meaning of the vernal equinox from the biblical viewpoint? From p. 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 about 4500 years ago. The earth's axis and tilt has remained virtually constant for those 4500 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.

Ancient peoples could determine the true east-west line based upon the the fact that on the days of the equinoxes (and only on those days), the sun's path (and the sun's shadow of a vertically hanging rope) falls along the same straight line all day from sunrise to sunset. This is the straight line definition of the equinoxes. 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.

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

The equinox represents a path of righteousness because it shows a straight line path all day. These are the only days on which it symbolizes being straight. Mal 4:2, “But for you who fear My authority 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 all day, which is symbolic of the path of righteousness. One proverb alludes to this association of the equinox to the path of righteousness, especially when it is translated very literally.

Prov 4:18, “But [the] path [734 *orach*] of [the] righteous is like [the] light of brightness going and giving-light as-far-as the confirmed [3559 *koon*] day.” As one's behavior confirms that one is righteous, the straight path of light of the sun's shadow confirms the day of the equinoxes. Here the translation “confirmed” is from the Hebrew word *koon*, which is found on p. 465 of BDB. Contexts are presented where *koon* has the sense of “confirmed / substantiated / established”. Confirmation of a day based upon observation of a path of light that is like a path of righteousness would have to be a straight line path. Some relevant examples of the use of *koon* are Gen 41:32; Deut 17:4; I Sam 23:23. The word *orach* was also shown for the path of the sun in Ps 19:5 above.

The ancient Israelite culture that produced this proverb recognized the special nature of the day upon which the sun's light produced a straight path, which is a recognition of the day of the equinoxes without mentioning a specific word for equinox. Upon taking some of the phrases of this proverb as idiomatic, it may loosely be translated, “The path of the righteous is like the straight path of light that confirms the day [of the equinoxes].”

The concept of equal daytime and nighttime is really not part of what is implied in Gen 1:14 for light-bearers in the heavens for ancient peoples. Equal daytime and nighttime is not a light marker when you stop to think about it!! Instead, this concept of equal daytime and nighttime is an accurate *measure of time*, which is not a light marker. Night is not a light. The abstract concept of equal daytime and nighttime requires a measure of nighttime 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 nighttime. A measure of time for a night is not a light. The concept of equal daytime and nighttime is really foreign to Gen 1:14. Until the year 1656 when Christiaan Huygens invented the pendulum clock, there were no clocks accurate enough to determine when daytime and

nighttime were equal. The biblical equinox is the straight line path all day, not equal daytime with nighttime. Many ancient peoples made the assumption that daytime and nighttime 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. Only the practical meaning that could be physically determined should be accepted, and this is the straight line path of the sun all day. The straight line path would determine the same day all over the earth except near the poles. In contrast to this, the day of equal daytime and nighttime 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.

[14] 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.

[15] Background History of the Meaning of Aries

On p. 31 of the book by Koch-Westenholz 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 year as observed from the earth. Constellations (recognized star groups) 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." These signs were and are used in horoscopes, but in ancient times their use also had the separate purpose of dividing up the year into 12 equal parts in a manner that differs from the Julian calendar months. The constellation named Aries gradually drifted

away from the sign named Aries, and when ancient writers spoke of Aries, they referred to the sign, not the star cluster.

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 Babylonain origin of the zodiac as 12 equally divided signs of the year between 464 and 454 BCE.

At the time that the zodiac was being developed by the Babylonians about 460 BCE, each named constellation did appear in the sky during some of the time of the sign that had its same name. However, from one year to the next year these constellations do not appear at exactly the same time in the sky. There is a very slow drift of the time of appearance of each constellation in the sky with respect to the vernal equinox each year. This slow drift in the time of the appearance of the stars each year has been named ***precession of the equinoxes***, and it takes about 25,800 years for the appearance of the stars to cycle around one complete year. The Greek astronomer Hipparchus discovered precession c. 140 BCE. There is no evidence that the Babylonians knew about precession. The main point is that the constellations slowly change position relative to the vernal equinox, but the signs of the zodiac remain fixed relative to the vernal equinox.

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 is almost 30.5 days.

The first of the 12 signs of the zodiac is named Aries, which is the Latin word meaning “ram”, so that sometimes this sign is called the Ram. The constellation of Aries is not the sign of Aries. The constellation drifts, but the sign does not drift. When writers are discussing time and they mention the name of a sign of the zodiac, they are never referring to the 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 p. 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 according to Columella.

On pp. 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 p. 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 them. On p. 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 p. 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 pp. 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. P. 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 Geminos wrote an elementary book on astronomy called *Introduction to the Phenomena* c. 90-35 BCE, according to the translators James Evans and J. Lennart Berggren (p. 19). In this work, at 1:19 (p. 114), Geminos 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 p. 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 solsticial 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.)

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 p. 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 compilator 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 p. 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."

In summary, outside of the tradition of the Greek astronomers including Hipparchus, Geminos, and Ptolemy, all of these Greeks (in or near Alexandria) favoring the vernal equinox to begin at the start of Aries, were the non-astronomers Pliny, Vitruvius, and Columella, who wrote that the vernal equinox begins at the eighth degree of Aries. The city of Alexandria and possibly parts of Asia Minor promoted the terminology for Aries of the Greek mathematical astronomers (i. e., the vernal equinox is on the first day of the sign of Aries), but elsewhere in the Roman Empire, the terminology of Pliny was promoted in the first century (i. e., the vernal equinox is on the *eighth* day of the sign of Aries).

[16] Control of the Temple, and thus the Calendar, in the Early First Century

When studying the history of the calendar whose roots are embedded in the Tanak, one encounters writings from the New Testament, from Josephus and from rabbinic literature.

Then the reader is faced with the problem of determining whether all the statements one finds in these sources are historically true. There is a huge time gap from the fifth century BCE when Ezra and Nehemiah lived to the first century environment of the New Testament. Josephus was born in 37 CE, and while he wrote about events in the prior century, his sources from that time are not subject to independent checks for accuracy. Undoubtedly there were elderly folk who could give him personal recollections from the decades prior to his birth. Due to the difficulty in verifying information in Josephus from before the first century, our attention from his writings will be confined to the first century.

(A) Primary Sources of History in the early First Century

In analyzing who controlled the Temple before the war between the Romans and the Jews broke out in 66, the major primary sources are the New Testament and Josephus, and the question of whether the rabbinic texts that begin with the Mishnah (c. 200 CE) are to be properly accepted as primary sources deserves some initial brief comment. From the destruction of the Temple in Jerusalem in 70 CE to the publication of the Mishnah c. 200 CE is 130 years. While the authors of the New Testament were personal witnesses of what they wrote (though Mark and Luke received their information from others who were personal witnesses) and Josephus was a personal witness beginning about the middle of the first century (he was born in 37 CE, but utilized other historians before him, especially Nicolaus of Damascus for events in the second century BCE), the Mishnah was not set into its written form by anyone who was a personal witnesses of events before 70 or who personally knew anyone who was such a personal witness. Except for some relatively few apparent borrowings from the Megillat Taanit (published c. 120), it is not known how the infrequent historical statements in the Mishnah and later rabbinic texts from before the destruction of the Temple have found their way into those texts.

However, by comparing certain statements in these three sources with one another that relate to authority in Judea during the time sought, and by supplementing this with a few remarks from the Roman historians Tacitus and Trogus, we can make a reasoned evaluation on whether the use of the Mishnah and later rabbinic texts are reliable as a historical source of events from before 70. In any case, the Mishnah falls short of being a primary source because it was not put into published form close to the time of the events we now seek (before 70 CE), and we have no record of any primary sources that it utilizes except for the Megillat Taanit, which is only a very condensed skeleton of some events, and which was completed c. 120. Rabbinic texts may have used some primary sources for some of its historical statements, but this is a guess.

In the present discussion our interest lies in which groups of Jews controlled the Temple services, especially during the first century before the war began in 66. The New Testament mentions the high priest, chief priests, Sadducees, Pharisees, and scribes. Josephus mentions these groups also, but adds the Essenes and the zealots. Since the latter two groups are never mentioned in the New Testament, they should be dismissed as candidates for having control of the Temple in the 70 years before its destruction.

(B) Branches of Modern Judaism relate to evidence on this Issue

Jewish scholars are biased in their writings and opinions, and it is important to address this in order to warn the reader concerning the literature on this subject. Scholars may be grouped based on their personal religious affinity, and this is sometimes reflected in their writing even though they may carefully avoid telling the audience their religious outlook.

Modern Judaism is divided into many groups, but these may be roughly categorized into four divisions based upon their attitude toward the Pentateuch and the Talmud. My summary is somewhat oversimplified and it pertains to the culture within the United States rather than modern Israel, but growing up as a Conservative Jew in New York City and having a grass-roots feel from personal contacts, in my opinion it is not very far off base. Certainly not all individuals within these groups conform to the characteristics to be described next, but these characterizations do approximately reflect the historical development of these divisions and the views of some major scholars from these groups. Jewish laymen sometimes tend to be more idealistic and less studied in the details of their religion, so that many of them are less likely to fit the broad description than the knowledgeable students and scholarly representatives. In discussing these divisions, the major emphasis will be on their attitude toward the law of Moses, and that is the reason for limiting the discussion to the Pentateuch within the Tanak. All of the divisions of Judaism consider the entire Tanak to be a sacred document of their religion.

The first division is Orthodox Judaism, which treats both the Pentateuch and the Talmud as inspired, and accepts the laws of the Pentateuch as they are interpreted in the Talmud. The second division, Conservative Judaism, treats both the Pentateuch and the Talmud as sacred documents of their faith, but regards common views of archaeological interpretation as well as secular history and biblical textual criticism as valid sources for occasionally modifying their reliance on the Pentateuch and the Talmud as representing correct history. Adherents of Conservative Judaism tend to be less strict in their observance of the laws than Orthodox Jews, and their knowledge of the Talmud (excluding Conservative scholars) is typically significantly less than that of Orthodox Jews. Adherents of Conservative Judaism generally do not accept the legal interpretations of the Talmud to be authoritative in theory or in practice in their lives. The third division, Reformed Judaism, treats the Pentateuch as a sacred document, but not the Talmud. Reformed Jews regard the laws of the Pentateuch to be interpreted figuratively or allegorically, and to be applied in a changeable way according to the times. From a literal standpoint Reformed Jews are the least observant of the laws of the Pentateuch. Reformed Jews do not regard the Pentateuch as depicting correct history. The fourth division, Karaite Judaism, treats the Pentateuch as inspired, but the Talmud is not considered to be a sacred document. Karaites interpret the laws of the Pentateuch in a literal way, and they are strict in observing them. Karaism is the smallest of the four divisions in numbers of adherents, and their interpretation of the laws is not uniform amongst themselves. Orthodox Judaism and Karaite Judaism both represent Jewish fundamentalism, but the latter discard Talmudic interpretation.

It is to be expected that a scholar who was reared in Judaism will be biased toward the Talmud according to that rearing. Only Orthodox scholars will be heavily motivated to treat the Talmud as representing true history, although a minority of Conservative

scholars will write in such as fashion that they will often appear to masquerade as Orthodox Jews. If one examines a book, a paper, or an article in an encyclopedia that was written by an Orthodox Jew, one can expect that author to use the Talmud heavily as accurate history. All Jewish scholars will downplay the New Testament. Within their writings, Jewish scholars very rarely label themselves according to their specific Jewish upbringing, but the reader who examines their works can usually decide whether or not each one appears to favor the Orthodox position. It is important to make some judgment about an author's position because bias plays a role when the reader is trying to determine which position represents correct history. It is possible to use certain criteria in order to judge whether it makes sense to treat the Talmud as if it was inspired, which is the accepted position of Orthodox Jews.

If two laymen are debating an issue and one of them uses an opinion by an implicit Orthodox Jewish scholar while the other uses a differing opinion by a Conservative Jewish scholar, the two laymen will not be able to agree because the sources that they each favor are in disagreement. That is the reason why it is so important to go back to the primary sources and discuss the place of the Talmud for historical purposes before the Temple was destroyed. After this is done and after the bias of a scholar is identified, one will know how to weigh that author's writings.

(C) The New Testament as a Primary Source

The writers of the New Testament were convicted to motivate its readers to seek eternal life according to the faith they had come to accept, but except for Paul who declared himself to be a Pharisee (Acts 23:6; 26:5; Phil 3:5), there is no clear evidence that they were personally biased for or against the Pharisees compared to the Sadducees in the subject of who controlled the Temple. Josephus devoted more personal attention to the politics of the groups and was involved in politics, so he should be expected to be far more biased than the writers of the New Testament. From these considerations it should be clear that the most important primary source of historical information from before the Temple was destroyed in 70 CE is the New Testament, so this will be discussed first.

Obviously, favoring one primary source will produce conclusions that are biased toward that source. Any author who arrives at conclusions has no choice but to favor some source after giving reasons. Both Sadducees and Pharisees are condemned in the New Testament in the sense of having incorrect teachings (Mat 16:6, 11-12). Thus, according to the writers of the New Testament, one cannot look to either of these groups as having the original biblically correct understanding of some particular teaching of the Tanak merely because of the label *Sadducee* or *Pharisee* attached to the doctrinal opinion.

(D) Many of the Scribes were Sadducees. Mat 23:2 and Moses' Seat

Luke 20:27 [NKJV], “Then some of the Sadducees, who deny that there is a resurrection, came to [Him] and asked Him,

Luke 20:28, saying: ‘Teacher, Moses wrote to us [that] if a man's brother dies, having a wife, and he dies without children, his brother should take his wife and raise up offspring for his brother.’” [Speech continues through verse 33]

Luke 20:34 [Response to the Sadducees], “The sons of this age marry and are given in marriage.” [Speech continues through verse 38]

Luke 20:39, “Then some of the scribes answered and said, ‘Teacher, You have answered well.’

Luke 20:40, But after that they dared not question Him anymore.”

From verse 39 it is clear that scribes had been there all along, and from verses 27 and 40 it is clear that these scribes were Sadducees. In fact the Sadducees would not have asked Him this sensitive question if Pharisees had been present because that would have immediately sparked a heated debate between the two groups over their difference on this issue.

Acts 23:9 makes it clear that some scribes were Pharisees. Hence scribes included some Sadducees and some Pharisees.

On p. 22 of Bar-Ilan we find the following paragraph: “Most of the scribes of the end of the Second Temple period whose genealogy is known were priests: Yosef (T. Shabbat 13:11), Yohanan (P. T. Maaser Sheni 5:4, 56c), Beit Kadros (T. Menahot 13:19), Josephus and others. It is clear that during the time of the Temple, priests, some of whom were scribes, used to manage the Temple property, contributions and gifts in addition to annual tithes (Neh 13:13; T. Shekalim 2:14-15; Josephus, War 6:387-91). The Temple as the official cultural-religious center was also the center of the knowledge of reading and writing, and because of that the priests in charge of the Temple were evidently responsible for the preservation of the Tora, its copying in general and the scribal profession in particular.” Thus in the view of Bar-Ilan, a historical expert in the realm of scribes and priests in the first century, we see the priests in charge of the Temple and the scribes heavily represented by priests. Some writers have been unaware of the representation of priests among the scribes and have given a distorted picture of Mat 23:2.

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.

Thus, when we see Mat 23:2 [NASB], “The scribes and the Pharisees have seated themselves in the chair of Moses”, the scribes are mentioned first, and they have a major representation from among priests, which were seen to be closely equated with or within the Sadducees. Hence Matthew is not excluding the Sadducees from Moses’ seat, and the mention of Scribes (which includes Sadducees) comes first. There are three primary biblical functions of the Levitical priesthood. The first concerns the performance of the sacrificial system including personal counseling with those who bring sacrifices for personal reasons (such as to atone for their sins) and rituals at the sacred altar for the holy days, the Sabbaths, the new moons, and the daily sacrifices. The second concerns teaching the law to the people, which is shown in Mal 2:7 and Heb 7:11. The third concerns the prominent role of the priests and Levites throughout the court system of

Israel according to the law of Moses (Deut 17:9; 19:17; 21:5). Thus the priests were to officiate at the holy altar, teach the people, and judge legal cases.

Let us consider the meaning of “Moses' chair or seat” from Mat 23:2. Moses did have the supreme role in the first primitive court of one judge in Israel. In Ex 18:13-26 we see the role of Moses as the civil judge rather than in the role of communicating the law to the people. Ex 18:13 has the expression “Moses sat to judge the people”. This sitting implies a chair or seat of office for judging. The Hebrew word *shaar*, Strong's number 8179, is normally translated gate, but it sometimes means “court”. Deut 16:18 [NKJV], “You shall appoint judges and officers in all your gates [courts]...” Amos 5:15 [NKJV], “Hate evil, love good; establish justice in the gate [court]”. On p. 1045 of BDB the second meaning of this word is “space inside gate, as public meeting-place, market”, and within this category, BDB later adds “where elders, judges, king, sat officially”. Examples of sitting in the gate (meaning court) include Gen 19:1; Ruth 4:1-2; II Sam 19:8; I Ki 22:10; II Chr 18:9; Est 2:19, 21; Job 29:7; Prov 31:23; Jer 38:7. The advice of Moses' father-in-law in Ex 18:13-26 was a pyramid structure of judges, but in Num 11:16-17, 24-25 this pyramid structure was replaced by a flat structure (equal authority) of 70 men from among the elders of the people.

At the end of the 40 years in the wilderness, more details about the future court system were revealed in Deuteronomy, where Deut 17:9; 19:17; 21:5 show the prominent role of the priests and Levites throughout the court system of Israel according to the law of Moses.

From biblical examples, Moses' chair or seat sensibly means the official seat from which civil case judgment comes, a judicial function, not a legislative function. This is neither the changing of existing laws, nor the legislation of new laws, but the application of existing laws to specific cases in dispute between relevant parties who seek to bring their case to a civil court. Priests would not consider their procedures to be under the jurisdiction of a civil court. Civil justice of disputes does not include the methods and rules whereby the priests carried out their functions, which were not civil disputes in nature. This reasoning only considers the context of the Tanak applied to Mat 23:2, so the question remains as to whether, in the first century, an expanded jurisdiction existed for the main Sanhedrin in Jerusalem, in which it is assumed that Moses' seat was exercised. In a religious society certain aspects of civil laws must be derived from the law of Moses as it was understood in their day, but the question remains concerning whether the central Sanhedrin had a legislative function at all. The Sanhedrin will have to be discussed in more detail.

(E) Sanhedrin in the New Testament

The Greek word *sunedrion* for sanhedrin, Strong's number 4892, occurs 22 times in the New Testament. These are Mat 5:22; 10:17; 26:59; Mark 13:9; 14:55; 15:1; Lk 22:66; John 11:47; Acts 4:15; 5:21, 27, 34, 41; 6:12, 15; 22:30; 23:1, 6, 15, 20, 28; 24:20. In three of these places (Mat 5:22; 10:17; Mark 13:9) a local court is the meaning, but in all other 19 cases this is the Sanhedrin in Jerusalem associated with the Temple. In 17 of these 19 cases the Greek definite article is used, which implies that there is only one

Sanhedrin associated with the Temple. The two exceptions without the definite article are Mark 15:1 and John 11:47. The context of all 22 places is consistent in showing a civil court where accusation against a party is made, witnesses for or against that party are questioned, the accused party is questioned, and a judgment for or against that party is rendered. Except for Acts 23 where the outsider Paul introduced the doctrinal issue of the resurrection from the dead in order to cause strife and detract attention from his own case, in none of the meetings of the Sanhedrin associated with the Temple do we encounter a debate over the application of the law of Moses or the meaning of the Scripture. In the only examples available, the Sanhedrin appears to be a civil court in which civil cases are relevant, not an environment for the debate over biblical doctrine. The Sadducees and Pharisees appear to try to get along with one another peaceably within the Sanhedrin, except for the case in which Paul caused a stir over doctrine. The conclusion from the New Testament is that the Sanhedrin in Jerusalem associated with the Temple acted as the supreme court to hear cases, but did not engage in legislating new additions to the law of Moses.

(F) The Parable of the Wicked Vinedressers

Luke spent considerable time with Paul (a former Pharisee) - see Col 4:14; II Tim 4:11 and the “we” portions of Acts that includes the presence of Luke as the author - Acts 16:10-17; 20:5 - 21:13; 27:1 - 28:16. Luke partially relied on Paul for some of the relations between the leaders of the Jews when he wrote. Paul, having been a Pharisee and having lived in Jerusalem, would have been an excellent first hand source of extra background information for Luke's writings.

Luke 20:9 [NKJV], “Then He began to tell the people this parable: A certain man planted a vineyard, leased it to vinedressers, and went into a far country for a long time.”

Luke 20:10, “... the vinedressers beat him ...”

Luke 20:11, “... they [the vinedressers] beat him also ...”

Luke 20:12, “... they [the vinedressers] wounded him also ...”

Luke 20:13, “... I will send My beloved son ...”

Luke 20:14, “... vinedressers ... reasoned among themselves ... let us kill him.”

Luke 20:15, “... they [the vinedressers] ... killed [him]. Therefore what will the owner of the vineyard do to them?”

Luke 20:16, “He will come and destroy those vinedressers and give the vineyard to others. And when they heard [it] they said. Certainly not!”

Luke 20:17, “Then He looked at them and said, What then is this that is written: The stone which the builders rejected Has become the chief cornerstone!”

Luke 20:18, “Whoever falls on that stone will be broken; but on whomever it falls, it will grind to powder.”

Luke 20:19, “And the chief priests and the scribes that very hour sought to lay hands on Him, but they feared the people - for they knew He had spoken this parable against them.”

The parallel passage in Mark starts in Mark 11:27 where it mentions, “the chief priests, the scribes, and the elders came to Him”. The continuous flow of the narrative goes down to Mark 12:12, “And they [chief priests, scribes, and elders] sought to lay hands on Him, but they feared the multitude, for they knew He had spoken the parable against them.”

The parallel passage in Matthew begins in Mat 21:33 and ends in Mat 21:45-46, “Now when the chief priests and Pharisees heard His parables, they perceived that He was speaking of them, but when they sought to lay hands on Him, they feared the multitudes, because they took Him for a prophet.”

In this parable the phrase, “the stone which the builders rejected” is mentioned in Mat 21:42; Mark 12:10; Luke 20:17 directly before the conclusion which shows that the leaders of Israel correctly perceived He was talking about them as the builders who rejected Him (the stone), and also about them as the vinedressers who killed Him (the son). Israel is the vineyard.

In the midst of the conclusion to this parable, when He says, in Mat 21:43, “the kingdom will be taken from you”, it is clear that He is agreeing with their interpretation that they are the leaders and that the kingdom refers to Israel and especially its government.

Luke says, “chief priests and scribes”. Mark says, “chief priests, scribes, and elders”. Matthew says, “chief priests and Pharisees”. Despite these differences, all three mention chief priests first. These leaders understood that they themselves were the vinedressers in the parable, and the vineyard was Israel. Thus the parable teaches that at the general time of the crucifixion, the leading position among Jews in Judea was in the hands of the chief priests, which were Sadducees, but the Pharisees also had some leadership. This is the clearest statement of which group held the leading position from the standpoint of the seat of semi-autonomous government permitted by the Jews under the Roman Empire.

(G) How the High Priest Spoke to the Audience that included the Pharisees

John 11:47 [NKJV], “Then the chief priests and the Pharisees gathered a council and said, What shall we do? For this Man works many signs.”

John 11:48, “If we let Him alone like this, everyone will believe in Him, and the Romans will come and take away both our place and nation.”

John 11:49, “And one of them, Caiaphas, being high priest that year, said to them, You know nothing at all, ...”

For the high priest to say to his audience that included the Pharisees, “you know nothing at all”, it seems obvious that he had no fear of the Pharisees and there could hardly be any substance to the idea that the Pharisees had so much authority over the Temple that they could push him around as they might choose.

(H) Pilate's Understanding of the Chief Priests’ Authority

Mark 15:10 [NKJV], “For he [Pilate] knew that the chief priests had handed Him over because of envy.”

If the chief priests did not have primary authority, but instead the Pharisees controlled the Temple area, the chief priests would have had less reason to be envious of the authority exercised by the Nazarene through the miracles. Instead the Pharisees would have played a more prominent role during the trial due to their authority, and the Pharisees would have shown envy. Note that Mark 15:10 does not say, “The Pharisees had handed Him over”, but instead, “the chief priests had handed Him over”. The last two times in Matthew that the Pharisees are mentioned are Mat 23:39; 27:62, but the trial occurred between these places. The last time that the Pharisees are mentioned in the other three Gospels are Mk 12:13; Lk 19:39; John 18:3, but these are all before the trial began. Thus the Pharisees by name seem totally absent from the trial.

(I) The Role of Gamaliel

Acts 5:34 [NKJV], “Then one in the council [= Sanhedrin] stood up, a Pharisee named Gamaliel ...”

If Gamaliel was the presiding officer of the Sanhedrin this would not merely say “one in the Sanhedrin”. The language of the New Testament shows that Gamaliel was not the head of the Sanhedrin.

(J) Legal Authority of the Chief Priests

Paul lets his audience know of his background as a Pharisee in Acts 23:6; 26:5; Phil 3:5, and as a former student of the Pharisee Gamaliel in Acts 22:3. If Paul had a choice in seeking credentials for authority, he would naturally seek it from among the Pharisees rather than the high priest or the chief priests who were of the Sadducees. Here is what we find when we see where Paul went for authority. Acts 9:1-2 [NKJV], “Then Saul … went to the high priest and asked letters from him to the synagogues of Damascus so that if he found any who were of the Way, whether men or women, he might bring them bound to Jerusalem.” Acts 9:14, “Ananias said, And here he [Paul] has authority from the chief priests to bind all who call upon Your name.”

Acts 26:10, “This I [Paul] also did in Jerusalem, and many of the saints I shut up in prison, having received authority from the chief priests; and when they were put to death, I cast my vote against them.” In Acts 26:12, “While thus occupied, as I journeyed to Damascus with authority and commission from the chief priests...” We see that Paul does not go to any supposed Pharisaic leader for legal authority, but rather to the chief priests. Paul's personal identification with the Pharisees would have caused him to go to the Pharisees for authority if they could give it.

Acts 22:30 [NKJV], “The next day, because he [the Roman commander] wanted to know for certain why he [Paul] was accused by the Jews, he released him from his bonds, and commanded the chief priests and all their council [= Sanhedrin] to appear, and brought Paul down and set him before them.” Here the Roman commander shows that he understands “their Sanhedrin” to be that of the chief priests despite the fact that in Acts

23:6 Paul perceives that both Sadducees and Pharisees were present. Thus the chief priests were dominant.

The Pharisees did have sufficient clout in the local synagogues that they could excommunicate Jews from the life of the synagogue provided there was reasonable cause (John 9:13, 21-22, 34; 12:42). However, the synagogue environment is not the Temple where the chief priests (Sadducees) were dominant.

(K) Conclusion from the New Testament

The evidence from the New Testament has been given, and the Sadducees including the high priest and chief priests are clearly dominant concerning the overall political control of civil government from the semi-autonomous viewpoint that the Romans permitted. Qualification to the Levitical priesthood was a matter of heredity, not learning, and not popular support. Since only the priesthood was permitted to carry out the Temple services commanded in Scripture, and the priesthood was associated with the Sadducees, we would conclude that the Sadducees dominated the control of the Temple services. But there is still a need to discuss Josephus and the rabbinic texts.

(L) The Roman Historian Tacitus

Scholars estimate that Tacitus was perhaps 15 to 20 years younger than Josephus. He wrote most of his history while Josephus was still alive. He wrote in Latin, the common language of the city of Rome, and had records from the library at Rome as references. In Tacitus' History 5:8 (p. 662), he wrote, "A great part of Judaea consists of scattered villages. They also have towns. Jerusalem is the capital. There stood a temple of immense wealth." Later in the same section and p. he continues, "The Macedonian power [Alexander the Great and the Greek generals that succeeded him] was now weak, while the Parthian had not yet reached its full strength, and, as the Romans were still far off [in time and distance], the Jews chose kings [the Maccabeean dynasty] for themselves. [Foreigners were] Expelled by the fickle populace, and regaining their throne by force of arms, these [Maccabeean] princes, while they ventured on the wholesale banishment of [some of] their subjects, on the destruction of cities, on the murder of brothers, wives, and parents, and other usual atrocities of despots, fostered the national superstition [Judaism] by appropriating the dignity of the priesthood as the support of their political power."

This negative account of the Jews by Tacitus after their four-year war with the Romans ending in 70 CE (ending in 73 in Masada) does attribute political power of the Jews to the priesthood as Rome saw the situation while the Temple stood. Since the successive governors of Judea were appointed by the Roman government from 6 CE until the war broke out in 66, this view by Tacitus must represent the viewpoint of the Roman governors who were there. Notice the attitude of the Roman governor Pilate in Mat 27:24 [NKJV], "When Pilate saw that he could not prevail at all [in front of the large crowd of Jews], but rather that a tumult was rising, he took water and washed his hands before the multitude, saying, 'I am innocent of the blood of this just Person.'" Mark 15:15 declares that Pilate wanted to gratify the crowd. The Roman governors recognized the priesthood as having legal status over the Jews, and they backed up the priesthood with their

authority in order to keep the Jews stable and the taxes to Rome flowing steadily. According to Josephus these governors sometimes changed high priests as they saw fit. Even John 11:49 states, “Caiaphas, being high priest that year”, thus implying frequent changes in the priesthood. At the very top Rome was in charge, but Rome used its governor to control matters through the high priest. Rome backed the priesthood to keep the country stable. When the Temple was destroyed and Rome was angry with the Jews for starting the fighting that began the war, Rome no longer backed the priesthood. We see that Tacitus agrees with the conclusion of the New Testament.

(M) The Roman Historian Pompeius Trogus

The third generation Roman citizen Pompeius Trogus wrote a history in Latin c. 20. (see pp. 2-3 of Yardley and Develin). At some time within the next 200 years a person named Justin wrote excerpts from Trogus’ history, and these excerpts survive in Latin (pp. 2-6). The well known early church father Augustine (c. 400) wrote that Justin wrote a brief history following Trogus (p. 6). On p. 230 we find this translation of 2:16, “After Moses his son, Arruas, was made priest in charge of the Egyptian objects of worship, and soon afterwards king. And ever after that it was the practice amongst the Jews for their kings to be their priests as well. This integration of their judicial and religious systems made the Jews unbelievably powerful.” The following comment on this statement appears on p. 241 of Stern, “Pompeius Trogus anachronistically depicts all Jewish history according to the conditions that prevailed during the Hasmonaean [Maccabeean] monarchy, when the king and the high priest were the same person; …” This excerpt from Trogus, who wrote in the early first century, shows that he understood the Levitical priests to exercise the judicial function. This independent primary witness agrees with Tacitus and the New Testament in attributing primacy of Jewish authority to the priests.

[17] 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 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 Essences. 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 perforce, ***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]."

This idea is also expressed by Daniel R. Schwartz 1983, where, on p. 164 he wrote, "But Josephus' claims in *AJ* [Antiquites] could be understood as an attempt to support the Pharisaic bid, in the nineties of the first century [when it is safe to expect that the priesthood was fading from view], to *reenter* politics and gain the recognition of the Roman government."

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.

[18] 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 Alexandra. 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.

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

In an earlier chapter abundant evidence was presented from the New Testament, Tacitus, and Trogus to show that that the priesthood controlled the Temple in the first century before the war broke out in 66. 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 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.

[20] Philo of Alexandria and the First Jewish Month

Philo of Alexandria (c. 20 BCE – c. 50 BCE) lived within a wealthy Jewish family that enabled the best education that one may desire. He was well educated in the Greek tradition of Alexandria, the leading city of scientific achievement in that era, although active Babylonian astronomy did not fade away until near the end of the first century. Philo wrote extensively about biblical matters and philosophy from a Jewish viewpoint, yet he injected some Greek philosophy as though it was part of Judaism. Philo represented mainstream Judaism in Alexandria. His Bible was the Greek Septuagint (= LXX), and he did not know Hebrew according to today's scholars.

In Gen 1:14 where the Hebrew text has the plural of *moed*, which is typically translated seasons, or festivals, or appointed times, the Septuagint has the Greek word *kairos* (Strong's number 2540). The various versions of the Jewish Aramaic paraphrased translations of the Bible 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 the Bible, the use of *moed* is only associated with the festivals when restricted to contexts that involve cycles of the heavenly lights. 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 Septuagint that is commonly available to us.

Philo discusses Gen 1:14-16 on pp. 34-47 of Philo_1 (*On the Creation* 45-61). On pp. 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 pp. 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 drift 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 this. 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 ***not*** 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 p. 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. In order to properly evaluate this, the reader should be familiar with the prior chapter on the zodiac and Aries (= Ram).

Philo was well educated, but not in the area of mathematical astronomy. Nevertheless it is probable 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 pp. 2-5 of Philo_QE (Exodus, Book 1.1). On p. 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 p. 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."**

Elsewhere Philo made it clear that the Jewish month begins with the sighting of the new crescent. The reader is therefore expected to know that he is speaking about a lunar calendar in Scripture. Philo wrote this last item without any explanation that presupposes his general audience from Alexandria would understand what he meant by "the notions of time held in the ordinances and traditions of various nations."

My commentary to this last sentence is based on p. 391 of Alan E. 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 (p. 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.

In none of this is there any use of barley to determine the first month, and the Septuagint does not force Philo to take the position he takes. There is never a hint that the Jews in Alexandria waited with anticipation to hear the news of barley reports so they could begin their plans for the Passover.

[21] 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.

[22] 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 Phlio 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.

[23] 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, 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, 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 month*s, 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 Passsover 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 calender 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.

[24] 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."

[25] 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. 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

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.

[26] 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.

[27] Saadia Gaon and the Origin of the Modern Jewish Calendar

This chapter begins with a brief historical review and summary before discussing the history of the modern Jewish calendar. The biblical calendar was maintained utilizing the performance of the Aaronic priesthood from the time of Moses until the destruction of the Second Temple in 70 CE. However, the Babylonian exile caused a temporary disruption in central control relating to the Jewish people because the priesthood worked with the cooperation of the secular government. The Jews in exile were primarily in one region within Babylon between the Tigris and Euphrates rivers. The Persian King Cyrus issued an edict that permitted those Jews who were motivated to return to Jerusalem. The returning Jews were under the leadership of the priest Ezra and the governor Nehemiah. The priests were the primary literate class who maintained the Scriptures and set the dates for festivals. With the blowing of the two silver trumpets to announce the start of each month (Num 10:10; Ps 133) they maintained the biblical calendar. Neh 5:14 shows that Nehemiah as governor had the authority to establish the religion in Jerusalem in its purity, free from paganism. Neh 8:2, 9 shows that the first day of the seventh month was holy when kept in Jerusalem under the leadership of the priest Ezra and the governor Nehemiah.

In an earlier chapter abundant evidence was presented from the New Testament, Tacitus, and Trogus to show that during the first century before the war broke out in 66, the Aaronic priesthood controlled the Temple.

In Deut 33:10 we note the important role allotted to the priests in the tribe of Levi, "They shall teach Jacob Your judgments and Israel Your law. They shall put incense before You and a whole burnt sacrifice on Your altar." After the destruction of the Temple, as far as history provides evidence, the priesthood ceased to function and its ability to provide guidance to the application of the biblical calendar ceased. Thus Deut 33:10 was no longer applied after the destruction of the Temple in 70. History records changes in the calendar used by the Jews long after 70. With these changes, it seems natural to refer to the calendar used by the Jews as the Jewish calendar rather than the biblical calendar.

The details of what happened to Jewish leadership in the decades after 70 is lost to our knowledge, but later history shows that the interpretation of the law of Moses as portrayed in the rabbinic literature (Mishnah, Tosefta, two Talmuds, etc.) became the leading voice representing the Jewish people. This literature did not change the biblical foundation of using observation rather than any calculation to establish the calendar. On the other hand, this literature did introduce confusion and uncertainty into the calendar because of its conflicting opinions. It is significant that even before this literature began to be published c. 200, Christians recognized that there appeared to be a disparity between Jewish Greek literature (especially by Philo and Josephus) compared to the then current practice of the Jews which fluctuated with no clear rules. Due to this uncertainty, some Christians in Alexandria began to attempt to determine the first month prior to publication of the rabbinic literature.

In Jewish history, Saadia Gaon represents a challenge to the claim that calculation was not part of older practice to determine the Jewish calendar, and that is a reason for dealing with Saadia Gaon.

Saadia Gaon (882-942) wrote the oldest known dictionary of biblical Hebrew and the oldest known grammar book of biblical Hebrew. He translated most if not all of the Tanak (the Hebrew Bible) into Arabic. He is considered one of the greatest Jewish philosophers during the post-Talmudic period. He was given the title Gaon because he became the head of the Jewish academy in the city of Sura (in modern Iraq). He championed rabbinic Judaism against his Jewish sectarian opponents and was a fierce debater. In the history of the Karaite movement in Judaism he is considered their most famous enemy because he engaged in heated arguments with the Karaites and he sought to dissuade Jews from joining the ranks of the Karaites. On p. 86 of the chapter by Alexander Marx 1944 we read, "Numerous [Jewish] sects arose in the East [Iraq/Iran], and while most of them were of ephemeral character, they inaugurated a movement which finally led to the rise of Karaism, a sect which was founded in the second half of the eighth century and is still in existence." Saadia was born in 882, about 100 years after the Karaite movement began.

Saadia's most frequent topic of debate with the Karaites is that of the religious calendar. Saadia championed the modern calculated calendar. The Karaites did not follow the calculated calendar of the Jews and sought to use phenomena that were observable to determine the beginning of each month and to determine which month is the first. One category of Saadia's works is known as polemical works. These are writings whose primary purpose was to defeat the positions of his enemies before some audience. If the audience is lacking in knowledge, a debater may be able to make invalid claims and still win the hearts of the audience. When evaluating any polemical work, the reader must be on guard to determine whether the writer is being objective and fair with history and all available evidence. Evidence will be presented to show that Saadia was neither objective nor fair with history.

On p. 159, Samuel Poznanski 1898 wrote, "The Sectaries, especially the Karaites, by their attacks on the [calculated] Calendar, misled so illustrious a genius as Saadiah into anachronisms, logical fallacies, and egregious blunders. The Gaon claims that the [calculated] Calendar is of Sinaitic origin [given to Moses at Mt. Sinai], and that its rules [concerning postponements, mathematics, etc.] existed in the days of Moses. It was easy for his [Karaite] opponent to demonstrate the utter absurdity of this contention. And Hai Gaon had to admit that Saadiah did not really intend the assertion to be taken seriously. His [Saadia Gaon's] object was to snatch a momentary triumph in the verbal combat."

On p. 393 Solomon Zeitlin 1943 wrote, "Already Hai Gaon had noticed that Saadia Gaon's arguments were only for the purpose of dismissing the [Karaite] heretic. Isaac ben Baruch, who quoted Saadia's contentions at length, refuted him on every point and showed from the Talmud the fallacy of Saadia's ideas. Maimonides was even stronger in his utterance against Saadia. Maimonides said that he wondered how a man could say that the Jewish religion was not [originally] based on the observation of the moon but on calculation only; he continued that Saadia, regardless of true or false statements, was only interested in refuting his opponent. Abraham Ibn Ezra also maintained that what the Gaon (Saadia) said about the Jews [originally] intercalating the months according to calculation was not true." On pp. 393-394 Zeitlin continued, "Indeed everyone who is acquainted with the Talmud knows that in the time of the Tannaim [Talmudic sages who were alive from c. 1 through c. 250] the Jews did not have a fixed [calculated] calendar: Passover [Nisan 15] did fall on Fridays; *Rosh ha-Shanah* [referring to the first day of the seventh month, but literally meaning "head/beginning of the year"] fell on Sundays; the Day of Atonement fell on Fridays and on Sundays." On p. 394 Zeitlin wrote, "However, Saadia Gaon believed that *the end justifies the means*. He had a righteous cause and he fought with all the means he thought necessary."

On p. 37 Salo Baron 1943 wrote, "However, in the rage of controversy he [Saadia] did not hesitate to reinterpret history in a way which, although violating historic facts, would serve his major historic purpose of combating heresy."

From the above quotations we note that in Saadia Gaon's debates with certain Karaites in which a Jewish audience is assumed to be present, he had claimed that the rules of the calculated Jewish calendar were given to Moses at Mt. Sinai, but leading Jewish sages shortly after him recognized that these claims were absurd because there was nothing in history to back up such claims and the Talmud contradicted such claims in several ways. This implies that Saadia did not think his Jewish audience would possess any knowledge of the origin of the calculated calendar that they were following. Thus the origin of the calculated calendar must already have been somewhat of a historical secret among the laity of Judaism shortly after 900 when these debates occurred. It is at least clear that the rabbis in the rabbinic synagogues did not actively teach the history of the calculated calendar because if they did, the Jewish audience would know its history and the famous Saadia would be a laughing stock among common Jews.

The average length of the month as mathematically expressed in the modern calculated Jewish calendar was first stated in rabbinic literature in the *Babylonian Talmud* (published c.500-600), and this exact value was first determined by the ancient Babylonians about 330 to 300 BCE. This value is identical to the value given by the Greek astronomer Hipparachus c. 150 BCE, and he copied it from the Babylonians. It does not make sense to imagine that this value was given to Moses over 1000 before this Babylonian invention, as Saadia Gaon would have his Jewish audience believe. This is the only mathematical parameter within the rules of the calculated calendar that appears in the Talmud, but there are several other mathematical parameters that comprise the calculated calendar. The Talmud itself does not claim that this value is used or will be used in the Jewish calendar. The Talmud never claims that the Jewish calendar is to be calculated.

On p. 48 of Wiesenberg 1971 we note the following concerning the Patriarch Hillel II who lived in Palestine and who is mentioned in many places in the *Babylonian Talmud*, "According to a tradition quoted in the name of Hai Gaon (d. 1038), the present Jewish calendar was introduced by the patriarch Hillel II in 670 Era of the Seleucids – 4119 Era of the Creation = 358/59 C.E. (500 C.E., claimed to derive from another version, seems to rest on a mistake)." This quotation, put in simple terms, says that the claim that the modern calculated Jewish calendar originated with Hillel II in 358/359 is based upon one writing by Hai Gaon (died 1038, Gaon of the academy of Pumbedita). Nothing known before Hai Gaon alleges this.

On p. 158, Samuel Poznanski 1898 wrote, "If [shortly after 900] it had been generally believed that the [calculated] Calendar was fixed by Hillel II, it would have been not merely idle and futile, but probably foolish on the part of Ben Meir [a major Jewish leader and scholar in Palestine], who, rightly or wrongly, styled himself a descendant of the Patriarch [Hillel II], to revolt against the Calendar [with regard to only one aspect of one of its postponement rules], of which his own ancestor [Hillel II] had been the author, and in regard to which Palestine [the dwelling place of Hillel II] had laid down the law for all Israel." Here Poznanski presents a strong argument that Ben Meir did not believe

that Hillel II established the rules of the calculated calendar!! This is an argument that Hillel II did not establish the calculated calendar.

A second argument that Hillel II did not establish the calculated calendar is that the *Babylonian Talmud*, published c. 500-600, states much about Hillel II, but nothing about Hillel II in relation to the calendar. While this is an argument from silence, and is therefore subject to criticism on that ground, matters associated with the calendar are often mentioned in the Talmud, so it would be surprising if such an important matter were totally neglected in the Talmud. The Talmud mentions nothing about there being an authoritative calculated Jewish calendar.

A third reason that Hillel II did not establish the calculated calendar is presented on p. 118 of Poznanski 1911. There he points out that in the years 506 and 776 there are dates in the Jewish calendar that contradict the modern calculated calendar. In fact this implies that the modern calculated calendar was established in its near current form on or after 776.

On p. 254 of Stemberger 2000 he translates the following from a work of Maimonides (1135-1204), “And when did Israel begin to calculate according to this calculation [the one used in the modern calendar]? Since the end of the scholars of the Gemara, in the time when Israel was laid waste and no fixed court remained there.” This is vaguely sometime after the Talmud was completed c. 600. Stemberger wrote on p. 255, “However, if he [Maimonides] had been aware of the tradition about a fixed calendar introduced by Hillel II, he would certainly have expressed himself with greater precision.” Maimonides wrote a complete exposition on the calculated calendar including explanatory remarks, so he would have made an effort to be precise if he had knowledge. This is a fourth reason that Hillel II did not establish the calculated calendar.

On p. 118 Poznanski 1911 wrote, “In point of fact, everything goes to indicate that the calendar, like all other productions of the kind, passed through a developing series of forms, and that it assumed its final shape in the schools of the official representatives of Judaism (called Geonim) in Babylonia.” (When the word “Babylonia” is used, it does not refer to ancient Babylonia when it was a nation, but it merely refers to the geographical location of ancient Babylonia just as with the term *Babylonian Talmud*.) There were two leading Jewish academies in Babylonia, one in Sura and the other in Pumbedita. The head of each academy was given the title Gaon. Qualifications of a Gaon were to be both a significant scholar and a respected leader within Judaism. In a sense it was a political feat to become a Gaon, although Jews did not have their own country. The two leading Babylonian academies were held in very high esteem by the rabbis in that era. Important rabbis were often trained there.

In the biographical sketch of the life of Hayyim J. Bornstein (1845-1928) by Abraham Fraenkel 1971, on p. 1252 we note, “Bornstein’s knowledge of chronology, history, and mathematics enabled him to open new avenues in the study of the development of the Jewish calendar. He based his theories on several documents in the Cairo *Genizah*, the

importance of which he was the first to recognize. Bornstein advanced the novel claim that the details of the Jewish calendar, with its small cycle of 19 lunar years and its method of reckoning the conjunction of the planets ["sun and moon" should replace the word *planets*], had not been calculated and accepted until sometime between the mid-eighth and mid-ninth century CE, and not in the period of the *amoraim* [sages of the Talmud after 250] under Hillel II as had been generally believed – much less in the first century CE, as claimed by the German chronologist F. K. Ginzel."

There is some speculation that perhaps only the fixing of the 19-year cycle was achieved by Hillel II. If this were true, the question remains as to why the Talmud and other authorities are completely silent on such a weighty matter.

The conclusion is that the origin of the modern calculated Jewish calendar was between c. 750 and c. 850, and it was agreed upon by the Gaonim (heads) of the Jewish academies at Sura and Pumbedita in what is now modern Iraq. These academies were the leading schools that produced rabbis and Jewish scholars. The Karaite movement began c.770. There was no Sanhedrin during this part of Jewish history.

[28] W. Robertson Smith's Commentary on Barley in Exodus 9:31-3

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 the 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 pp. 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 p. 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 report.ed 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 Penteteuch. 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 dertermine 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 is 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 p. 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 p. 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 p. 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 p. 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 p. 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.

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 Journal Article 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*.

[41] Outline of the Modern Jewish Calendar Method

Many statements of how the modern calculated Jewish calendar works have been presented in various publications. One source is Spier 1981. This chapter is only designed to give an outline of the method along with a discussion of how this method relates to astronomical and biblical reality.

This method begins with a calculation for the first day of the seventh month. However, this calculation has the following characteristics:
(1) It begins with the time of an approximate conjunction (astronomical new moon) in the historical past rather than any sighting of the new crescent. This is the beginning anchor.
(2) It uses a calculation that is the equivalent to the following description. It uses a ***constant multiplier*** for the average length of a month. It calculates the ***month number*** that is needed to arrive at the seventh month. It multiplies the following two items: (a) the

constant multiplier; and (b) the ***month number***. The product that is obtained is added to the anchor. This becomes the candidate for the first day of the seventh month.
(3) The following four days of the seventh month are not allowed to fall on a Friday or a Sunday: day 1, day 10, day 15, day 22. These are the days in which work is forbidden by Leviticus 23 for the seventh month. This prevents the occurrence of two successive days of no work in the seventh month. This principle is technically expressed by four postponement rules that cause the candidate for the first day of the seventh month to perhaps be postponed one or two days later than the candidate.
(4) Except for months eight and nine, all odd numbered months always have 30 days and all even numbered months always have 29 days.
(5) There are miscellaneous rules to determine the number of days in months eight and nine., either 29 in both, or 30 in both, or 29 in one of them and 30 in the other.

The practice of employing these rules yield the following results:
(1) The sighting of the new crescent and the determination of the first day of months numbered one (Nisan) and seven (Tishrei) agree about 20 percent of the time. When they disagree (about 80 percent of the time), the difference is one or two days. The rules of the calculation cause the calculated day to precede the actual sighting of the new crescent by one or two days 80 percent of the time. This assumes that the weather is clear for sighting the new crescent.
(2) The ***month number*** that is used in the calculation above is based upon the assumption of the accuracy of the 19-year cycle. The 19-year cycle is the assumption that 19 tropical years exactly equals 235 lunar months. This requires that in each 19-year cycle there are seven years that have 13 months and all other months have 12 months.

The inaccuracy of the 19-year cycle is as follows: for each 1,000 years, the first day of Nisan moves forward by about 4 ½ days (i. e., further away from the vernal equinox). This means that in 80,000 years Nisan 1 will move all the way around the year (through all four seasons) from vernal equinox to vernal equinox. This violates the approximation of the agricultural year to the biblical months.

In the present century, use of the modern Jewish calculated calendar causes its first month Nisan to fall one month *before* the month that begins on or after the vernal equinox either four or five times in each 19-year cycle.

The time of the average length of a lunar month that is used in the calculation is quite accurate.

The *Babylonian Talmud* in tractate Rosh Hashanah 21a (RH21a), gives the rule claimed to be authored by Huna ben Abin (c. 350), that Passover must fall on or after the vernal equinox. Although the Roman Catholic determination for the month of Easter is stated in slightly different terminology along with a calculation that is based upon the 19-year cycle, its result is virtually equivalent to RH21a as computed by the modern Jewish calendar. This is the reason that Easter Sunday today almost always occurs shortly after

Passover in the modern Jewish calendar. Part of the explanation of Easter by the Roman Catholic Church is that if the calculation for Easter Sunday falls on the same day as Passover by the Jews, then Easter is postponed to the next Sunday. The reasonable speculation is that the Jews approximately copied the Roman Catholic Church without admitting it. Doing this would bring peace between the Roman Catholic Church and the Jews. The Jewish calculated calendar followed RH21a when it was first initiated, but due to the error in using the 19-year cycle, it no longer follows RH21a.

Knowledge of the Babylonian calendar in order to understand the implications of the month names in Ezra, Nehemiah, Esther, and Zechariah was lost after the year 75, and was not revealed until almost 1900. Year 75 is the last year in which the Babylonian calendar is recorded in clay tablets.

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