The two primary divergent beliefs concerning the time that the biblical month starts, are:

1. The sighting of the new crescent in the western sky near sunset begins the month.
2. The astronomical new moon (also called the conjunction) begins the month.

The conjunction is only visible in the rare case of a solar eclipse. The natural question is whether it was possible to determine the time or the day of the conjunction at the time of Moses. There are also other questions that require discussion on this choice.

2. Astronomy of the Moon

Sir Isaac Newton was the first one to prove that all heavenly bodies that orbit other heavenly bodies (far away from significant interference by other heavenly bodies) travel in the path of an ellipse rather than a circle. The moon's orbit around the earth is an ellipse, and the earth is not in the center of the ellipse. This causes a lack of symmetry in time as will be explained.

Because of the elliptical orbit of the moon, the day of the conjunction cannot be known.
from the day of the full moon. When Richard A. Parker was a professor at the University of Chicago, he wrote the following on the bottom of page 6 of Parker 1950: “The necessary time for full moon varies from 13.73 to 15.80 days after conjunction.” This is a swing of 2.07 days, which is about 49 hours 41 minutes. This shows that the conjunction is not exactly opposite the full moon in length of time.

If one considers counting days beginning with the sundown-to-sundown day on which the conjunction occurs, then the full moon occurs from the 14th to the 17th day of the count. The 17th is very rare.

If one considers counting days beginning with the sundown-to-sundown day that begins with the sighting of the new crescent in the western sky, then the full moon occurs from the 12th to the 16th day of the count. The 16th day is very rare. Typically the full moon occurs on the 13th, 14th, and 15th day of the count.

During perfectly clear weather there are from one to three nights around the time of the conjunction when the moon cannot be seen at all.

Here are some facts from astronomy and its history.

1. The variation in the orbit of the moon around the earth causes the time of the exact full moon to frequently not be close to half the time from conjunction to conjunction.
2. The first day of the biblical month cannot be determined from knowing the day of the exact full moon.
3. In the region of Mesopotamia and the eastern Mediterranean, the ability of humankind to approximate the time of the conjunction began c. 360 BCE by the Babylonians, but their attention and interest was on predicting possible solar eclipses, not on the conjunction. The Babylonian astronomer-astrologers had no interest in the conjunction, but instead they were interested in predicting the day that he new crescent would be visible and predicting possible eclipses.
4. Babylonian mathematical knowledge of astronomy passed to the Greek specialists c. 330 BCE.
5. Historical evidence indicates that the Jews did not acquire the ability to approximate the time of the conjunction before the Temple was destroyed in 70. Only Greek specialists had this knowledge, which required years of specialized education that had no practical use. It would have required an excellent knowledge of Greek and living where such knowledge was capable of being taught – Alexandria, Egypt. The only ancient book that taught this was written c. 150 CE. Its author was Ptolemy from Alexandria, and his work is commonly known as the Almagest. This book was too advanced to be understood on its own. It required special education to be understood.
6. From the viewpoint of known history, the biblical month could not have begun with April 8, 2014.
the conjunction because people at the time of Moses did not know how to approximate this time.


(A) Ancient Egyptian and Israelite Mathematical Astronomy

The Hebrew Bible gives no hint of advanced mathematical astronomy from the days of Moses. Ancient Hebrew lacks any hint that the Israelites had a positional numbering system based on powers of 10 with a zero, or instead, using a different number base than 10. Ancient records attach a unique Hebrew letter to a major rounded number such as 100, 500, 1000, etc., instead of indicating a positional numbering system. This necessitates great difficulty in performing large computations, especially in division and the general use of fractions. The lack of a positional numbering system would pose a great handicap in developing mathematical astronomy within a society. The question about whether ancient Jews could have learned mathematical astronomy from neighboring cultures will now briefly be discussed.

The Jewish philosopher Philo of Alexandria (c. 20 BCE – c. 50 CE) came from a wealthy family and possessed an excellent secular education, but his writings reveal that he did not study mathematical astronomy. It is clear that such a subject did not have a general practical use and required too much effort for the vast majority of wealthy people to be motivated to master. Alexandria became the leading center of Greek science and mathematical astronomy after the death of Alexander the Great. While some ancient Greek books from the first century and before did have mathematical astronomy, they were not written for beginners. It was evidently expected that a very rare student that had the motivation to master this subject would need to learn it directly from an expert in mathematical astronomy rather than from a book. In the middle of the first century Pliny the Elder, who traveled and studied science extensively, and who wrote the multivolume work Natural Science that included some astronomy, failed to include anything on mathematical astronomy, and his effort in that subject indicates his limited ability. It is not reasonable to think that people in Judea in the first century mastered mathematical astronomy. To do so, they would have had to become very proficient in Greek, and then study under a rare expert in Alexandria. It is difficult to comprehend why anyone in Judea would be motivated to do this, and the expense would have been great to pay the astronomer for long-term lessons and to live near the famous Library-Museum in Alexandria.

We possess many ancient records involving astronomy from ancient Egypt before the time of Alexander the Great c. 330 BCE, and three large volumes of ancient Egyptian
astronomical texts have been published, but none of it involves mathematical astronomy. The ancient Egyptians before Alexander did not have a positional numbering system, yet they were able to perform computations that were slow and awkward, especially in the area of multiplication and division of fractions. This would be a great handicap for the development of mathematical astronomy. Historians of ancient Egyptian science are agreed that while they possessed great skill in constructing buildings using mathematics, they did not have the mathematical astronomy to be able to predict the time of the conjunction before the Greek scientists moved to Alexandria after 330 BCE. Greek science was transplanted to Alexandria rather its coming from native Egyptians.

(B) Ancient Babylonian Mathematical Astronomy and the Jews

The ancient Babylonians did develop a positional numbering system involving the base 60. It had the equivalent of a zero, and the positional use of fractions. Early mathematical texts from Babylon did not employ more than three positions with the base 60 because their applications did not require long numbers. But later from about 700 BCE onward, when they applied mathematics to astronomy, they used more positional characters and developed general methods for handling lengthy fractions. These mathematical tools were exactly what was needed for success in mathematical astronomy. They incorrectly assumed that heavenly bodies traveled in circular orbits and they did not understand the laws of motion that were developed before 1700 by Sir Isaac Newton in England. Thus they had limited success, but their achievements in mathematical astronomy were still impressive.

By about 750 BCE they were able to predict the day of lunar eclipses after having discovered the Saros eclipse cycle, which is 223 mean synodic months (18.03 years). They were first able to predict the approximate position of the planets by the sixth century BCE, and within the next two centuries they were able to do the same for the moon. It was more difficult for them to predict the day of a possible solar eclipse than a lunar eclipse because such a solar eclipse (covering of the sun by the moon) was comparatively rare and requires knowing whether the shadow of the moon will reach the earth, as well as the path of that shadow on the earth. They could not do this, but eventually, by about 360 BCE the Babylonian astrologer-astronomers who worked for the pagan temple enterprise could predict that a solar eclipse might occur on a certain day, and they could even estimate its time of appearance if it could be seen. Their average accuracy in predicting the time of a solar eclipse was about three hours. Their average accuracy in predicting the time of a lunar eclipse was about one hour.

The reason for this difference in accuracy lies in the fact that full moons (when a lunar
eclipse occurs) are visible, but very few conjunctions are visible. It was difficult to predict what you can almost never see to verify the prediction. The Babylonians were very interested in attempted predictions of solar eclipses, but they did not have any special interest in predicting ordinary conjunctions because that had no value for them.

Predicting eclipses did have a very practical use for the Babylonian temple astrologer-astronomers. It gave them great stature in the eyes of the king and the public, and it gave their claims of being able to predict the future some credibility. Thus the king would be motivated to support them with contributions and pay for their predictions. For this reason these temple scholars kept their science of mathematical astronomy a secret unto themselves. To enhance this secrecy, they wrote their works in the cuneiform script, in the Akkadian language, which had become a nearly dead language except to these temple scholars and a very few other scholars in Babylon. Aramaic had become the common language of the people in the Babylonian Empire. When the House of Judah was taken captive by Nebuchadnezzar from 605 to 586 BCE, the common language of the captors was Aramaic. Jewish scholars in captivity in Babylon as well as after their release into general society in Babylon had no access to the secret mathematical astronomy of the pagan priests that was written in cuneiform script, with its roughly 500 different symbols. In 538 BCE Cyrus the Great of Persia conquered Babylon, and the mathematical astronomy of the Babylonian priests continued as before, along with the use of the Babylonian calendar and the Aramaic language.

When Alexander the Great conquered the Persian Empire in 331 BCE, he forced the Babylonian temple astrologer-astronomers to reveal their methods to the Greek mathematicians, and thus their advanced methods were passed to the leading Greek scholars. These Greek scholars transformed the Babylonian methods into their own methods of circular geometry, which the Babylonian priests did not use. This transfer of mathematical astronomy occurred soon after 330 BCE, and from that time onward the leading Greek mathematicians could also predict eclipses with the same accuracy in time. Moreover, the Greek geometric methods made it natural for them to approximate the time of conjunction with about the same degree of accuracy as the Babylonians predicted solar eclipses, that is, with an accuracy that averaged about three hours.

There is no reason to imagine that the pagan priests of Babylon would have shared their secret knowledge of mathematical astronomy with the Jews because they wanted to keep the prestige and profits from astrology to themselves. The complex cuneiform script in the nearly dead Akkadian language was foreign to the Jews, and the Babylonian priests were hostile to the religion of the Jews. Indeed the prophet Daniel wrote of the hostility of the pagan priests toward him. They wanted Daniel dead in the lion's den.
The basic conclusion is that the Jews did not have any good opportunity to learn advanced mathematical astronomy before the Temple was destroyed in 70 CE. Only Jews who lived in Alexandria would have been in the proper place of skilled Greeks. Jews who lived in Judea did not have the appropriate depth of knowledge of the Greek language to grasp the advanced learning that would have been required. At the time of Moses there was no advanced mathematical astronomy available for approximately predicting the time of the conjunction. The concept that the biblical month began with a rule that involved the advance prediction of the conjunction does not agree with the history of mathematical astronomy. Moses lived about 1000 years before the Babylonians were able to approximate the time of the conjunction.

[4] The Aaronic Priesthood has a Role regarding the Calendar

According to the law of Moses certain activities related to the calendar are required to be performed by the Aaronic priesthood. Specifically, at the beginning of each month, in the context of Num 10:1-10, notice the following activity of the priesthood.

Num 10:8, “And Aaron's sons, the priests, shall blow with [the two silver] trumpets.”
Num 10:10, “And on [the] day of your gladness, and on your appointed-times [4150 moed], and on the beginnings of your months [2320 chodesh], you shall blow with [the two silver] trumpets over your burnt offerings and over [the] sacrifices of your peace offerings, and they shall be to you for a memorial before your Almighty; I am YHWH your Almighty.”

Ps 133 shows calendrical unity via the authority of the Aaronic Priesthood.

Ps 133:1, “A song of the upward-steps, by David. Behold how good and how pleasant [is the] dwelling of brothers, yes-indeed in-unity.”
Ps 133:2, “[It is] like the good oil upon the head, descending upon the beard, Aaron's beard, descending upon the edge of his garments.”
Ps 133:3, “Like the dew of Hermon descending upon the mountains of Zion, because there YHWH commanded the blessing of life forever.”

Verse 2 mentions Aaron, the first high priest, who thus represents the Aaronic priesthood. Anointing with oil upon the head bestows authority on the priest (Ex 28:41; 29:7-9; 30:30; 40:13-15). This is saying that dwelling in unity is like the oil of authority upon the Aaronic priesthood, because unity can only come about if the priesthood properly teaches the law (Lev 10:8, 11; Mal 2:7) and signals the beginning of each month through their blowing of the two silver trumpets (Num 10:1-2, 8-10). Only then can there be spiritual unity, and with individual spiritual growth, the ideal outcome of
this will be the blessing of eternal life (note Ps 133:3). The appointed-times, the days of holy convocation, were indirectly announced by this priesthood at the beginning of the first and seventh months. This was a means of promoting unity in collective worship and unity of the days of holy convocation. There could be no opposing opinions and disunity concerning the day of the beginning of a month because of the authority of the high priest to achieve unity. This priesthood that was used to achieve unity was only given residence within Israel (Num 35:2-8). **If the priesthood had used a computation, then the start of a month could have been known without blowing any silver trumpets, and the computation would have brought unity without the need for any priesthood!!**

To speak of pleasantness in unity, as seen in verse 1, implies a mental peace that can only come by willing agreement with the decision of the priesthood (Ps 133:1-2). If knowledge to achieve spiritual unity is attained, it should produce uniformity in recognizing the days of holy convocation, the appointed-times.

Through the symbol of oil, Ps 133 shows calendrical unity through the authority of the Aaronic Priesthood. Verse 1 shows that this unity is good and pleasant.

**Positive evidence that calendrical unity was only to be achieved through the authority of the Aaronic priesthood does exist in Ps 133. In that psalm the unity of the brethren was to be achieved through the anointing oil upon Aaron's beard, which symbolizes the bestowing of authority upon that priesthood to bring about unity.**

[5] Appointed-times and Years are known from Lights in the Sky, Gen 1:14-18

Gen 1:14, “And the Almighty said: Let there be lights in the expanse of the heavens to separate between the daytime and the night, and let them be for signs, and for appointed-times [4150 *moed*], and for days and years.”
Gen 1:15, “And let them be for lights in the expanse of the heavens to give light on the earth, and it was so.”
Gen 1:16, “And the Almighty made the two great lights, the greater light to rule the daytime and the lesser light to rule the night, and [He made] the stars [to rule the night].”
Gen 1:17, “And the Almighty set them in the expanse of the heavens to give light upon the earth”
Gen 1:18, “and to rule by daytime and by night, and to separate between the light and the darkness.”

In verse 14 the word *moed* appears. The only meanings of *moed* that make sense in the
context of periodically occurring events based on the heavenly lights are the annual festivals, the seventh day Sabbath, and bird migrations. Since the latter only occurs once and the former occurs 40 times, it only seems sensible to understand the appointed-times here to refer to the annual festivals and the Sabbath. Since the annual festivals are determined by, or embedded in, the calendar, this verse makes the calendar dependent on or determined by the lights in the heavens.

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

The word “signs” [226 oht] in Gen 1:14 is used for the rainbow in Gen 9:12-13, for the ten plagues in Egypt, for the Sabbath in Ex 31:13, 17, for a miracle in Judg 6:17, for the prediction of two deaths in I Sam 2:34, and in other ways. Gen 1:14 is saying that the lights in the heavens are examples of signs. Carefully reread Gen 1:14 to note that it is not saying that signs [226 oht] are to determine the appointed-times and years. The subject of the sentence is the lights in the sky, not the signs. The light from the lights in the sky determine signs. The light from the lights in the sky determine appointed-times. The light from the lights in the sky determine days. The light from the lights in the sky determine years. Verse 15 shows that it is some aspect of the light from these lights in the sky that cause the determination.

The nature of the rulership of the heavenly lights mentioned in verses 16-18 is the dominance of their light, which again puts emphasis on the visible light from these lights. At the end of verse 16, concerning the stars, I added in brackets “to rule the night” because that is exactly what is mentioned about the lights, including the stars, in verse 18.

Some unique aspect of the light from the heavenly bodies acts as a trigger for the items mentioned, which includes the calendar. The key to the biblical calendar is a light trigger. There is no hint of a calculation or a prediction here, only the lights.

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.

April 8, 2014
Conclusions:
(1) Gen 1:14-15 includes the concept that festivals, the Sabbath, and years are to be determined by the light coming from the lights in the heavens.
(2) Thus the biblical calendar is determined by light coming from the lights in the heavens, that is, by light triggers.
(3) The theory that the conjunction should be used to determine the biblical month is contrary to the emphasis on light.

[6] A Month is a Cycle of the Moon

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

This use of appointed-times establishes that the moon is one of the heavenly bodies specifically indicated in Gen 1:14.

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, 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 vowels 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 vowels 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 a cycle of 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.

[7] A Biblical Month is a Whole Number of Days

A cycle of the moon around the earth is about 44 minutes more than 29.5 days, but in
this chapter we shall see from some verses using both of the Hebrew words for month, namely *chodesh* and *yerach*, that biblically speaking, a month is a whole number of days, with no fraction remaining. In Judea in the first century the Jewish culture did use a common term for hour, but earlier in ancient Israel’s history, there is no small subdivision of time such as hours or minutes. However, by some unknown means, the night was apparently split into three “watches” (Ex 13:34; Judg 7:19; Ps 63:6; 90:4; 119:148; Lam 2:19).

If there is always clear weather for good visibility, and people look for the new crescent from Israel, then the number of days from one new crescent to the next new crescent will be 29 or 30.

The literal expression *a month of days* as seen in several Scriptures is idiomatically translated *a full month* in almost all translations. These examples (see Gen 29:14; Num 11:19, 20, 21; Deut 21:13; II Ki 15:13) show that a biblical month is a whole number of days.

[8] The Sun and Moon are the Primary Lights in Gen 1:14

From Lev 23:2-4 we note that the Sabbath is an “appointed-time” [4150 *moed*]. The Sabbath is often called the seventh day because it repeats in a seven-day cycle as is seen by the 50 day count to the Feast of Weeks. Thus the Sabbath is not determined by the moon; instead it is determined by counting days, and days are determined by the alternation of darkness during the night followed by light during the day. This alternation of darkness and light is a result of the alternation of the absence and presence of the light from the sun, so that the sun is involved in determining this appointed-time, the Sabbath, but the moon is not involved for the following reason. Each month (or specific cycle of the moon) there are from one to three nights during which the moon cannot be seen at all, even with clear weather. During this period of invisibility of the moon, the days that are counted to arrive at the Sabbath have no contribution in counting light by the moon because the moon cannot be seen at that time. Notice the following description of rulership or dominance by the light of the heavenly bodies.

Ps 136:7, “To Him who made the great lights ...”
Ps 136:8, “The sun to rule in [the] daytime ...”
Ps 136:9, “The moon and the stars to rule in [the] night ...”

These verses show that the sun and moon are called the great lights, but the stars are also said to rule in the night. If it is not cloudy or rainy all night (and sometimes it is), it is possible to count the days by counting the nights during which one sees the stars as well.
as the daytimes during which one sees light given by the sun. However it is not possible to count days by counting the light from the moon due to its varying period of invisibility each month.

The use of the sun rather than the moon to determine the count to the Sabbath as an appointed-time, as well as calling the sun and the moon “the great lights” in Ps 136:7-9 and declaring the moon to be for appointed-times in Ps 104:19, show that the sun and moon are the major contributors as lights to determine the appointed-times.

[9] The Biblical New Moon relates to the Sighting of the New Crescent

The Hebrew noun *chodesh* [2320] (meaning *month* as well as *new-month* or *new-moon*) has the same consonants as the Hebrew adjective *chadash* [2319] (almost always translated “new”, and having the meaning “new”) and the Hebrew verb *chadash* [2318] (about half the time translated “renew” and half the time “repair”). Hence the collective association of *new, renew, and repair* is associated with the Hebrew word *chodesh*, rather than the concept of old, dwindling, or thinning, which is associated with the old crescent. On page 403 of Wigram all 53 places where the adjective *chadash* [2319] occurs is shown. Some of these are not describing a physical thing, such as a new spirit and a new heart. Other things that are physical are also visible such as a new house (Deut 20:5), a new wife (Deut 24:5), new wineskins (Josh 9:13), new cords (Judg 15:13), a new cart (I Sam 6:7), a new sword (II Sam 21:16), a new garment (I Ki 21:29), a new bowl (II Ki 2:20), etc. On page 403 of Wigram all 10 places where the verb *chadash* [2318] occurs is shown. Some of these are not describing a physical thing, such as a renewed spirit. Other things that are physical are also visible such as repair the altar (II Chr 15:8), repair the house (II Chr 24:4), repair waste cities (Isa 61:4), etc. The moon is a physical object, so that when the concept of “new” is applied to a month based on the moon, it should refer to something that is visible. Gen 1:14-15 refers to lights in the heavens, and this is something visible. The new crescent is new, visible, and is based on the moon.

Therefore, from the choice of the Hebrew word *chodesh* for the new-moon, the new-moon must refer to the new crescent rather than the old crescent.

[10] The Adoption of the Babylonian Month Names in Scripture

In the context of Jerusalem Ezra 6:15 mentions the month Adar and Neh 6:15 mentions the month Elul. These are Hebrew transliterations of month names in the Babylonian calendar, but these verses are in the context of Jerusalem. Scripture is a witness here that ancient Israel adopted the month names of the Babylonian
calendar by about the time of Ezra and Nehemiah. This would cause confusion unless a biblical month began by the same concept as the Babylonian calendar, which did begin a month with the new crescent.

[11] Isa 47:13 shows that a Month begins with the New Crescent

Isa 47:13 is a most interesting verse of Scripture because it teaches much about the Hebrew word *chodesh*. The period of Isaiah’s visions is from c. 760 to c. 700 BCE. Isa 47:1, 11 is a prophecy that eventually Babylon would be defeated, and Isa 47:13 is a taunt directed at Babylon.

On page 8 of Rochberg 2004, she wrote, “The nightly watch of the sky seems to have been standard Babylonian practice since the reign of King Nabonassar (747-734 B.C.).” On page 2 of Swerdlow 1998, he wrote, “Prognosticate by the new moon they [the Babylonian astrologers] did, and by the full moon, and by the appearance of the moon, and by eclipses of the sun and moon, and by the risings and settings and conjunctions of stars and planets, and by halos and clouds and rain and winds, in short, by anything in the heavens, astronomical or meteorological, that could be taken as ominous, a prophetic sign given by the gods.” When Swerdlow began with the words “prognosticate by”, he meant that based upon the conditions that prevail during the time of the events mentioned, they would make predictions about the future with the intent that they would come to pass. With this historical context in mind, here is a literal translation of Isa 47:13.


Some translations and commentaries on this verse attempt to interpret it in a manner that makes it appear to divide up the heavens into the signs of the zodiac. This is an error because the origin of the zodiac as 12 equally divided signs of the year began between 464 and 454 BCE. Horoscopes are based on the zodiac. The year 410 BCE is the earliest known text of a horoscope. The origin of both the zodiac and horoscopes is ancient Babylon. Today's knowledge of ancient Babylonian history makes it clear that *havar* should mean “astrologers”. The context indicates that the declarations of the astrologers are predictions or prognostications. History shows that at this time the Babylonian temple astrologer-astronomers made predictions about the king and the nation.

In this verse the Hebrew word *chodesh* [2320] occurs in the plural, and it is preceded by

April 8, 2014 12
the single letter lamed, which is a preposition that is pronounced “l”. Pronounced together it is leh-chadasheem. The question arises concerning whether leh-chadasheem means “every month (i.e., monthly)” or “at the new moons” in Isa 47:13. Consider the following factors.

(1) This plural form of chodesh with this preposition lamed occurs in five other places in the Tanak. These are I Chr 23:31; II Chr 2:4; 8:13; 31:3; Ezra 3:5. This preposition is flexible and its meaning depends on the context. It often means at, for, or on”. In all six cases (Isa 47:13 being the sixth case) it may be consistently translated “at [the] new-moons”. In the five examples outside Isaiah the context prevents it from meaning “every month”.

(2) The translation “every month” is usually given in Num 28:14; I Chr 27:1; Est 3:7 where chodesh in the singular occurs twice in all three verses, and the preposition lamed is absent before these three double cases. The end of Num 28:14 literally means “month on month for [the] months of the year”. In the Hebrew it is “chodesh [singular] b-chadshoh [preposition bet and singular] l-chadshay [preposition lamed and plural] ha-shanah”. Here the plural form of chodesh is different from the plural form in Isa 47:13, though both have the preposition lamed. These three consistent examples show that the expression that is literally “month on month” (no lamed and no plural) means “every month”; thus there is no need for another expression (such as in Isa 47:13) to mean every month.

(3) In theoretical Hebrew grammar it would be a possibility for leh-chadasheem in Isa 47:13 to mean “every month”, but there is no biblical context in which this is an example that is implied by the context. On page 395 of BDB, Isa 47:13 is quoted to end as follows: “who declare, at the new moons, of (the things) which are to come”. Yet BDB contradicts itself on this, because on page 516, column 1, 9 lines from the bottom of the page, BDB states “every month” for leh-chadasheem in Isa 47:13. The Hebrew preposition lamed is very flexible, having a wide variety of meanings, so this is given as a grammatical possibility. Nevertheless, no known context implies that this was a method that was in fact used in the ancient Hebrew language to mean “every month”.

(4) During the era of Isaiah, on each night the Babylonian astrologers examined the sky for anything unusual, and then such unusual events were used as the basis for prognostications. It would be needlessly redundant for the end of Isa 47:13 to mean “monthly” when in fact the examination of the heavens was a nightly matter. However, prognostications were made for every new moon even if it was a very typical new moon. More emphasis was placed on the new moons because that was of central importance to the Babylonian calendar since it began each month. Translations of reports to the
Assyrian kings by those who supervised the nightly watchers of the skies that includes the time of the later life of Isaiah may be found in the book by Hermann Hunger 1992.

The above considerations provide good reasons to reject the proposal found in some translations that *leh-chadasheem* in Isa 47:13 means “every month”.

**Because Babylonian prognostications were made for every Babylonian new moon regardless of whether anything unusual was seen at that evening, Isa 47:13 shows that the Hebrew word *chodesh*, new-moon, is also applicable to the Babylonian new moon!!! This shows that the fundamental concept that underlies the Israelite new-moon and the Babylonian new moon are the same. Since the Babylonian new moon day began with the sighting of the new crescent, provided that there was subsequent official recognition of this sighting, but without allowing a month to have more than 30 days, the same concept should apply to the biblical new-moon.**

An astronomical reason for a biblical month to consist of a whole number of days is that each new crescent first becomes visible close to sundown, which is the time that the Sabbath begins and a numbered day of the month begins. A biblical month is from one new crescent to the next new crescent, which is a whole number of days. We thus see that from the biblical viewpoint, the average synodic month as a precise fraction of days, hours, and minutes is never hinted at in Scripture and is foreign to biblical thought.

[12] Philo of Alexandria and the Jewish New Moon in the First Century

As a Jew living in Alexandria, Egypt in the early first century, Philo discusses the new moon from his Jewish perspective. On page 333 of Philo_7 (Special Laws 2:41) Philo wrote, “The third [feast recorded in the law] is the new moon which follows the conjunction of the moon with the sun.” Since this follows the conjunction, it must refer to the (visible) new crescent. On pages 391 and 393 of Philo_7 (Special Laws 2:141-142) Philo wrote, “Following the order stated above, we record the third type of feast which we proceed to explain. This is the New Moon, or the beginning of the lunar month, namely the period between one conjunction and the next, the length of which has been accurately calculated in the astronomical schools. The new moon holds its place among the feasts for many reasons. First, because it is the beginning of the month, and the beginning, both in number and in time, deserves honour. Secondly, because when it [the new moon] arrives, nothing in heaven is left without light, for while at the conjunction, when the moon is lost to sight under the sun, the side which faces earth is darkened, when the new month begins it resumes its natural brightness. The third reason is, that the stronger or more powerful element [the sun] at that time [the new moon] supplies the help [light] which is needed to the smaller and weaker [the moon]. For it is
just then [at the new moon] that the sun begins to illumine the moon with the light which
we perceive and the moon reveals its own beauty to the eye.”

In Alexandria, the leading center of Greek mathematical astronomy at that time, the
conjunction is a well known concept to Philo, and he mentions the conjunction as a
contrasting time to the new moon. It is clear that to Philo the Jew in the early first
century in Alexandria, the new moon is the new crescent, and this begins the first day of
the Jewish month. Evidently the Greek geometrical abstract concept of the conjunction
had filtered down to the educated non-astronomer, Philo. He used this concept in writing
to his audience without defining it, so he understood that his audience would also
understand this term.

[13] The Two Witnesses Prophesy for 1260 Days = 42 x 30 Days = 42 Months

Based upon Isa 13:9-10; Joel 2:1-2; Ezek 32:7-8 there will be a future time when the sky
will be partially darkened for some length of time, and the “day of YHWH” is associated
with this time period. The context of Dan 7:21-27 fits that of the “day of YHWH”. Dan
7:25 has the phrase “time and times and half a time”. This identical expression is also
12:6, and the latter is explicitly stated to be 1260 days. The beast of Rev 13:6 fits
perfectly with the beast of Dan 7:25, which is the fourth beast in Dan 7:7-8, 19-27. The
“time and times and half a time” in Dan 7:25 was already shown to refer to 1260 days.
Therefore, the 42 months that are mentioned in Rev 13:4-6 is the same time period of
1260 days, which is a “time and times and half a time”. In this circumstance a month
divides out to be 30 days. This may be explained by recognizing that the moon will
not give its normal light, as shown in Isa 13:9-10; Ezek 32:7-8.

This indicates that a month has 30 days if the moon does not give its light or is mostly
not visible, thus giving a limit of 30 days. If there is a succession of months for which
the sky is cloudy or rainy over all of Israel where people reside on days near the start of
each of those months, then each of those months will have the maximum number of days
per month, namely 30 days. Then, when the weather first becomes clear at the start of a
month, that month may have less than 29 days to make up for the artificial prolongation
of some months to 30 days. This shows that a calculated conjunction is not used
because a calculated conjunction has an average month length of close to 29.5 days.

[14] Summary Problems with using the Conjunction

(1) At the time of Moses the Israelites were not able to determine the time of the
conjunction. No society at that time had such a capability.
(2) Gen 1:14-18 shows that light triggers determine the calendar, and the conjunction is not a **light trigger** because it occurs when there is no light except in the rare case of a solar eclipse.

(3) Psalm 133 shows that dwelling unity was achieved in Israel through the authority of the Aaronic Priesthood blowing two silver trumpets, not through any computation.

(4) The Jews from the time of Ezra and Nehemiah adopted the Babylonian calendar's month names, and this calendar began the month with the new crescent, not the conjunction.

(5) Isa 47:13 shows that the Hebrew word *chodesh*, new-moon, is also applicable to the Babylonian new moon, and the latter began with the appearance of the new crescent in the western sky near sunset.

(6) Philo of Alexandria shows that in the first century the Jews began a month with the sighting of the new crescent in the western sky near sunset.

(7) The time during which the two witnesses prophesy is a time period when the moon is mostly darkened and the months have 30 days each instead of approximately 29.5 days according to the approximate average conjunction. Hence the conjunction is not used.

[15] From Where should the New Crescent be Sighted?

All biblical contexts that mention the festivals seem to take it for granted that there are no conflicts and that there is just one day that is holy for each specific commanded assembly. The only exception might be the start of the seventh month where ancient Israel would occasionally keep two successive days unless the first day of the two was confirmed to be the first day of the month (I Samuel 20). The Aaronic priesthood was the authority that provided unity (Psalm 133). They were only supposed to dwell within Israel (Num 35:2-8).

The borderline for visibility of the new crescent is wide and fuzzy. Humidity and a great height above sea level can even cause gaps in visibility in one connected region. The wide fuzzy path of first visibility of the new crescent not only has gaps, but its path on the surface of the earth is curved and the curve varies from month to month for any one place. Any rule to reconcile this is arbitrary and subject to debate.

We do not have any Aaronic priesthood functioning today, but if we are given the same information that they could have through postings on web sites, then we could presumably arrive at the same decision they would, thus simulating the priesthood.

The way to attain peace and unity is to use the implication of Paul in Acts 18:21 in which he showed respect for the determination of the calendar by the Aaronic priesthood by wanting to be there for the feast.

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The problems with using local visibility are:
(1) How is it defined in today's world?
(2) How is it consistent with Num 10:10; Isa 2:3; Micah 4:2 where the priests determine the new month from Israel?
(3) How can it avoid confusion and disunity (Ps 133)?
(4) Does it avoid arbitrary decisions of distance for accepting witnesses?
(5) It will sometimes cause part of the world to keep the festivals one month later than other parts as in 2007.

The advantages of using visibility of the new crescent within Israel are:
(1) The definition is simple.
(2) It is consistent with Num 10:10; Isa 2:3; Micah 4:2.
(3) It is unifying and avoids confusion – Ps 133, thus respecting the Aaronic priesthood.
(4) Over 90 percent of the time it is not a borderline situation and it is predictable.

The use of the international date line (IDL) for the 24-hour day, starting with sundown as it gradually sweeps across the globe, has attained worldwide acceptance by keepers of the Sabbath. The sighting of the new crescent from within the boundaries of Israel should determine the day, and this day should be accepted around the world based upon the IDL with sundown as it sweeps across the globe. Places to the east of Israel may sometimes have to observe two days for the first day of the seventh month as was done according to I Samuel 20.

[16] Ezra and Nehemiah did not bring a Pagan Crescent Practice from Babylon to Judea

Some advocates of the conjunction theory to begin a biblical 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, so that the conjunction was used. These people go on to claim that after the return from the captivity under Ezra and Nehemiah, Israel, under the influence of the Babylonian calendar and Persian political dominance, no longer continued the alleged original practice since the time of Moses. To explain the biblical fallacy 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.

[17] Bibliography


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