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Trailing the Paper Moon: Astronomical Interpretations of Exodus 12:1-2

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Abstract. This poster presentation will trace the historical interpretive arc inspired by Exodus 12:1-2 and its commandment to observe the new moon and keep a calendar. An examination of religious sensibilities as filtered through the prism of these two Bible verses, this presentation will outline manifold interpretations found in Jewish and early Christian literature from the Biblical era through medieval times. The literary sources to be examined will span the poetic and fanciful sensibility of Midrash, the magical and literary bent of the Pseudepigrapha, as well as the thematic reframing of lunar motifs in the Patristic literature. Other religious and literary writings to be summarized will include those of ancient Jewish commentators such as the Tannaim, Amoraim, and later Medieval thinkers, as well as those of the Church Fathers and Biblical faith groups such as the Samaritans. Throughout, the emphasis will be upon understanding the interpretive literary trajectory of these verses, as well as upon the light these religious, calendrical and astronomical interpretations have shed upon the writers' changing understanding of humanity's place in the cosmos.

Introduction: The Calendar Commandment

This summary traces the historical interpretive arc inspired by Exodus 12:1-2 and its commandment to observe the new moon of the Jewish month of Nisan and maintain a calendar so as to fix the festivals in their proper seasons. Given the hundreds of interpretations spanned by my original study, a representative sampling is offered here, emphasizing the astronomical significance of these Bible verses in selected Jewish and early Christian literary sources from the Biblical through medieval eras.

The history of the interpretation of Exodus 12:1-2 begins the story of the evolution of the Jewish calendar, which has been modified over time, encompassing three major shifts:

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1. A move from the mandated new year of Exodus 12:1-2 in Nisan to the current new year, which begins in the month of Tishrei
2. A change in the signalling mechanism announcing the *molad*, the sighting of the new moon, from signal-fires to reliance upon messengers
3. The transition from a system in which the new moon was announced on the basis of astronomical observation, to the current, calculated Jewish calendar established during the time of Hillel II in the fourth century CE (common era). We will see evidence of these calendar shifts throughout the following commentaries.

Exodus 12:1-2

Our source text is as follows, in English translation:

- 1 And the Lord spake unto Moses and Aaron in the land of Egypt, saying,
- 2 This month shall be unto you the beginning of months: it shall be the first month of the year to you.

Greco-Roman Interpretations (c. 200 BCE to third century CE)

The revision and rewriting of Biblical narrative to meld with prevailing Hellenistic sensibilities can be seen in the writings of Josephus and Philo of Alexandria. Both interpreted the original text as it was translated into Greek in the Septuagint, which follows the Hebrew Bible text very closely. Of importance to the calendar, early Greek and Roman literature contains evidence of a Greco-Roman cultural view in which the patriarchs and Moses were magicians or masters of the zodiac. Vettius Valens (second century CE), the Roman writer Apuleius, and the writers Eusebius, Pseudo-Eupolemus and Alexander Polyhistor, as well as the Jewish Hellenistic author Artapanus, all saw Abraham as a great wizard who taught Egyptian Kings and Phoenicians about astrology. Here, Moses becomes a master time-keeper. This is underscored by the contemporary writings of the New Testament; Acts 7:22 records that Moses was 'no ordinary child', but was 'educated in all the wisdom of the Egyptians'. I would suggest that the above reputation was inspired by the connection of Moses to the text of Exodus 12:1-2, which sees the calendar given to Moses.

Josephus

Flavius Josephus (37–100 CE), the son of a Jewish priest, published his *Antiquities* in 93 CE. Heavily reliant upon the Septuagint text, his work reflects the cultural norms and customs of the Greco-Roman world. While there is only one section of the *Antiquities* which spans our section of Exodus (i.e., *Antiquities* 1:3:3), there are numerous references to the month of Nisan, or Xanthicus (Greek) in his literary output. Josephus refers to the first month in *Antiquities* 3:8:4, in which he describes the consecration of the tabernacle in Nisan on the new moon, and connects the celebration of Passover and the beginning of the year to the zodiac, referring to the sign of Aries as a marker of the spring equinox, or *tequfat aviv* (Hebrew).¹

Philo of Alexandria

In *De Vita Mosis* 2.41, Philo refers to the first month as the *beginning* of the spring equinox when Passover occurs. Philo also comments directly upon Exodus 12:1-2 in *Questions and Answers on Exodus*. Quoting the key verses, he states that Scripture 'thinks it proper to reckon the cycle of months from the vernal equinox',² and likens the first month to the 'head of a living creature'.³ Philo further extends this metaphor to the zodiac, 'For they call the Ram the head of the zodiac since in it the sun appears to produce the vernal equinox'.⁴ Painting a one-to-one correspondence between Earthly creation and the Heavenly bodies, Philo writes that the spring equinox is symbolic of the initial Creation, and describes the rhythmic movements of the stars, 'both fixed and planetary' and their influence upon Earthly life.⁵

The Pseudepigrapha and the Cosmic Clock

The book of *Jubilees* and *1 Enoch* (Ethiopic) describe the solar/agricultural year, and appear to allude to Exodus 12:1-2. Rich in astronomical and calendrical detail, Book Three of *1 Enoch* (*The Book of the Heavenly Luminaries*) in 72-82, describes the relationship between

¹ William Whiston, ed. and trans., *The Works of Josephus: Complete and Unabridged*. (Peabody, MA: Hendrickson Publishers, 1988), p. 92.

² Philo, *Supplement II: Questions and Answers on Exodus*, ed. E. H. Warmington, trans. Ralph Marcus (Cambridge, MA: Harvard University Press, 1970), p. 2.

³ Philo, *Supplement II*.

⁴ Philo, *Supplement II*.

⁵ Philo, *Supplement II*.

the courses of the sun and moon in the heavens, detailing the 364 day solar cycle which begins at the vernal equinox. On a related note, we also find reference to twelve *openings* of the wind, which may be allusions to the twelve signs of the zodiac. As it is presented in these texts, particularly 1 Enoch, the sun serves as a *cosmic clock* beginning with the month of Nisan (as per Exodus 12:1-2), and moving through zodiacal *gates*.⁶ Another Hellenistic document of the Pseudepigrapha, the *Book of Jubilees*, was likely written during the mid-second century BCE. *Jubilees* contains numerous calendrical references, particularly in 6:23-32, and is predicated on 'the dominion of the sun', that is, a solar calendar of 364 days, rewriting the creation story in Gen 1:14 to give the sun dominance.⁷ Further underscoring the calendrical linkage to other texts of the era, multiple copies of the book of *Jubilees* have been discovered at Qumran. Indeed, the Dead Sea scrolls, discovered in 1956, have shed a great deal of light upon the calendar of *Jubilees*. Like the calendar of the Book of *Jubilees* and *1 Enoch*, the Dead Sea Scrolls calendar (contained in many of the scrolls) is based on a solar year consisting of 364 days and 52 weeks.

Tannaitic and Amoraic Time: The Mishnah and Babylonian Talmud on Exodus 12:1-2 (c. first to sixth centuries CE)

Mishnah (circa 1st-3rd centuries CE)

The compilers of the Jewish legal material which formed the basis for the Talmud are known collectively as the Tannaim. Based on the same principles as the Babylonian calendar, and following the lunar cycles, the Mishnaic calendar designates months by their Babylonian names. These months all begin at the sighting of the new moon, or *molad*. According to the Tannaim, the first witness of the new moon must testify before a rabbinical court, which then announces the new month. Serving as literary evidence of the ways in which the Tannaim conceptualized and interpreted the new year of 1 Nisan, discussions of the *molad* are described in the Mishnah, throughout much of tractate Rosh HaShanah. Here, it is interesting to note that the Tannaitic conception of the *molad* was not purely astronomical, for throughout both the Tannaitic and later

⁶ James H. Charlesworth, ed., *The Old Testament Pseudepigrapha*, Vol. 1 (New York: Doubleday, 1983), p. 127.

⁷ James H. Charlesworth, editor, *The Old Testament Pseudepigrapha*, Vol. 2 (New York: Doubleday, 1985), p. 62.

Amoraic literature, the new moon is a hair-thin crescent moon while the astronomical new moon does not shine.⁸

In chapter 1, Mishnah 1, the topic of the new year comes into focus, as we read of four distinct new years, including the 1st of Nisan (as per Exodus 12:1-2), which was later demoted to being the new year for kings and the 1st of Tishrei for the reckoning of years (the Jewish new year in modern times) Here, we note several holy days which are no longer part of the Jewish calendar. While the new year for kings was celebrated in Mishnaic times, only the 1st of Tishrei and the 1st of Shevat are still celebrated today.

The Babylonian Talmud Tractate Rosh Hashanah (c. fourth to seventh centuries CE)

The rabbinic calendar was radically reformed around 359 CE by Hillel II, following Constantius II's ban on the Jewish New Moon announcements. Predicated on empirical sightings of the *molad*, the older Mishnaic calendar was replaced with today's incarnation, the fixed, mathematical calendar. This involved a drawn-out process, one which combined ingenuity and political struggle. The Babylonian Talmud details part of this early debate. The most direct commentary on Exodus 12:1-2 takes place within the tractate Rosh Hashanah, though a discussion also takes place in Sanhedrin 11b-13b. Tractate Rosh Hashanah contains an argument between Rabbi Joshua ben Hananiah and Rabbi Eliezer ben Hyrcanus, which centres upon the question of whether the months are counted from Tishrei (with the second month being Marcheshvan), or from Nisan (with the second month being Iyar). As history bears out, Tishrei won its place as the Jewish new year, for R. Eliezer stated that it is in Tishrei that Israel is destined to be redeemed a second time, and refers to the imperative to blow the *shofar* (ram's horn) at the new moon.⁹ Later on in the text, the Amoraic rabbis turned to the matter of new moon witnesses, discussing the transition from a system of fires signalling the appearance of the crescent moon to one involving messengers, and finally, to the abovementioned calculated calendar.

⁸ John Andre Moore, *Astronomy in the Bible* (Nashville, TN: Abingdon, 1981), p. 62.

⁹ Alan J. Avery-Peck, ed. and trans., *The Talmud of Babylonia: An American Translation*. IX: Tractate Rosh Hashanah (Atlanta, GA: Scholars Press, 1995), RH 7a, p. 159.

Drawing Conclusions: Synagogue Art on the first month of Nisan

As we have seen in the writings of Philo and Josephus, as well as many other Greco-Roman authors, the zodiac and its subdivisions into seasons, or *tequfot*, play a critical role in the astronomical/calendrical writings surveyed here. The term *tequfot* most often used to refer to the equinoxes is also sometimes used to refer to solstices in the literature of this era.

Dated as early as the third century CE, synagogues with mosaic floors offer us a view of the Bible interpretation in the popular culture of the era. Several synagogues in the Holy Land contain representations of the zodiac and the month of Nisan. The Synagogue at Beit Alpha, for example, has a Mosaic floor dated to the sixth century, containing images which reveal a combination of Jewish, Pagan and Christian imagery. The showpiece, or central panel, however, is a representation of the zodiac in which the sun god Helios appears in the middle, driving a chariot alongside the moon and stars. Surrounding Helios, in circular formation, are the twelve zodiac signs, beginning with the sign Aries. The four seasons, or *tequfot*, appear in each of the four corners of the mosaic. Of special note is the appearance of the god Helios. It is possible that the Pagan sun god was appropriated by the Jews of the time to represent the cosmic pattern of the Creator. This is hinted at by Philo, who refers to God as 'a charioteer' directing the universe and its laws.¹⁰

Interpretation of Exodus 12:1-2 in Exodus Rabbah

A stylized literary commentary upon the Book of Exodus, the Midrash of Exodus Rabbah forms a rich tapestry of expansions of, and illuminations upon, the Bible text. Quoting the key Bible verses, Midrash XV:1 refers to flowers which appear on the Earth upon winter's passing, after the Exodus has taken place. Here, we see examples of rebirth imagery, specifically reference to flowers as emblematic of springtime and renewal. This motif appears over and over again in Philo, the patristic writings and other texts. In a lyrical passage, the Midrash picks up the lunar theme of Exodus 12:1-2, comparing its light to the illumination of the patriarchs, for the thirty day month parallels the kingdom enduring for thirty generations, with a gap of fifteen generations between Abraham and Solomon. In metaphorical parallel, the Midrash writes that the moon begins to shine 'on the first of Nisan and goes on shining till the fifteenth

¹⁰ Erwin R. Goodenough, *Jewish Symbols in the Greco-Roman Period. Pagan Symbols in Judaism*. Bollingen Series XXXVII (New York: Pantheon Books, 1958), pp. 214–15.

day, when her disc becomes full; from the fifteenth till the thirtieth day, her light wanes, till on the thirtieth it is not seen at all'.¹¹ Here, we note the symbolic importance of the number fifteen. In this striking passage, the Biblical characters Abraham, Isaac, Jacob and others are all said to shine like the moon.¹² Referring to the new moon, the Midrash of Exodus Rabbah writes that this is 'one of the four things which God had to show Moses with His finger' in order to explain the calendrical commandment embedded in Exodus 12:1-2.¹³

Patristic Bible Interpretation or Father Knows [Calendars] Best

Spanning the period from approximately 100 CE through the eighth century, the Patristic era produced much fruitful Bible commentary. Owing to the Easter question, the Church fathers were interested in the Jewish Passover and the calendrical issue of *the first of months*, or Nisan. Finally, after some controversy, an initial date was decreed at the Council of Nicea in 325 CE, when the church fathers declared that Easter would fall on the first Sunday after the first full moon of the spring equinox, thereby parting ways with the Jewish calendar. Several themes bloom, if you will, within the patristic literature. Among these themes are the imagery of rebirth, the sacrificial lamb and, most emblematic of all, the springtime symbols of greenery and floral growth. Another image which often appears, however, is the moon. Indeed, as the Church Father Jerome writes:

The fourteenth day of the month is the day of the full moon; Christ is offered in perfect light.¹⁴

Next, we turn to the writings of Bishop of Caesarea and Gregory Thaumaturgus (c. 248–264 CE). Writing of Joseph and Mary in *Four Homilies*, Gregory Thaumaturgus extolls her virginity and bestows the commandment to observe *the first of months* upon her. As it is written:

And this was the first month to the holy Virgin. Even as Scripture says in the book of the law: "This month shall be unto you the

¹¹ Rabbi Dr. H. Freedman and Maurice Simon, eds, *Midrash Rabbah*. Exodus, trans. Rabbi Dr. S.M. Lehrman (London: The Soncino Press, 1961), pp. 196–97.

¹² Freedman and Simon, *Midrash Rabbah*. Exodus.

¹³ Freedman and Simon, *Midrash Rabbah*. Exodus, pp. 201–02.

¹⁴ Joseph T. Lienhard, ed., *Ancient Christian Commentary on Scripture*. Old Testament III (Downers Grove, IL: InterVarsity Press, 2001), pp. 56–57.

beginning of months" [. . .] For she was called Mary, and that, by interpretation, means illumination. And what shines more brightly than the light of virginity?¹⁵

Since this text mirrors that of Exodus, it might be surmised that the author is attempting to liken Mary to Moses, who himself is described in the Bible as shining, with rays of light emanating from his head, in addition to receiving the calendar commandment in Exodus 12:1-2. This also appears to allude to the light of the moon.

The first church historian, Bishop Eusebius of Caesaria (c. 260–340 CE), comments upon Jewish theology in books 7, 9 and 10 of *Preparation for the Gospel*, making specific reference to the primacy of the sun and the moon among the Jews, calling the stars and planets symbols of Divine power.¹⁶ I would suggest that in the above passages, we see Jewish imagery reframed and reconstituted into a new whole, with the *moon* being converted, so to speak, into a powerful Christian symbol symbolic of rebirth.

The View From Mount Gerizim: Samaritans on Exodus 12:1-2 (c. fourth century CE)

Considered to be one of the most important Samaritan works, *Memar Marqah* (*The Teaching of Marqah*) offers us some insight into Samaritan thought. Here, we read:

*The Lord said to Moses and to Aaron, after these wonders that had gone before,
"This month shall be for you the beginning of months the end of affliction and the beginning of relief. [. . .]It shall be the first month of the year, from which will come all the years of the world." [. . .]*¹⁷

¹⁵ Rev. Alexander Robertson and James Donaldson, eds, *The Ante-Nicene Fathers*. Volume VI (Grand Rapids, MI: Wm. B. Eerdmans Publishing Company, 1982), pp. 63–64.

¹⁶ Eusebe de Cesaree. *La Preparation Evangelique*. Livre 7, eds Edouard des Places and Guy Schroeder (Paris: Les Editions du Cerf, 1975), pp. 241–43.

¹⁷ John MacDonald, ed. and trans., *Memar Marqah. The Teaching of Marqua*. Volume II: The Translation. (Berlin: Verlag Alfred Topelmann, 1963), Volume 1, Memar Marqah, Footnote, p. ii.

Compared with the original Torah text, the interpretations encompassed by *Memar Marqah* read as do the more fanciful aggadic Midrashim. The Samaritan text links together earlier Torah verses with those of Exodus 12:1-2 and its commandment to observe the spring equinox of the month of Nisan. Here, we see allusions to the end of slavery as a result of the Exodus from Egypt, which also takes place within Exodus 12.

Middle Age[s] c. 900-1400 CE

During the medieval era, the Jewish interpretive literature expands considerably. A growing mystical interest on the part of the educated, perhaps connected with the popular idea of the human sphere as macrocosm of the heavens, came to be pivotal in this era's treatment of Exodus 12:1-2, for it found an outlet in the form of astrology. Here, we see a reiteration of Philo's belief that the heavens mirror life on Earth. Having made its way from Greece to the Arab world, astrology entered Christian Spain around the tenth century, and the rest of Europe by the twelfth, becoming the medieval equivalent of today's science. Indeed, astrology related the movements of the heavens to numerous fields, including natural philosophy and medicine.

Sephardic Developments: Spain and North Africa, eleventh to thirteenth centuries CE.

Abraham Ibn Ezra and Moses Maimonides

Jewish communities in Northern Africa flourished under Muslim control, exerting a strong influence upon Jewish Bible interpretation. The situation was similar in Spain, for during the eleventh century, the centre of Jewish studies shifted from Babylon to Europe. Spain soon produced prominent commentators who influenced Jewish and Christian biblical scholarship. Foremost among these were Abraham Ibn Ezra and Moses Maimonides.

Abraham Ibn Ezra (1089–1165 CE)

A native of Muslim Spain, Ibn Ezra was influenced by neo-platonic rationalism. A master of Bible interpretation, he was also an astrologer. Ibn Ezra's examination of Exodus 12:1-1 demonstrates a broad knowledge of medieval astronomy. Here, he details the moon moving through the zodiac and explains its relationship to the calendar, as well as the sun's role in producing the four seasons. In a striking awareness of the

science of his day, he writes that there is proof that the moon has no light of its own, but reflects that of the sun. According to Ibn Ezra, the Jews must therefore observe lunar months and keep the festivals in order through the solar seasons.¹⁸

Moses Maimonides (Moshe ben Maimon) (1135–1204 CE) on Exodus 12:1-2

Maimonides (also known as the Rambam) was one of the most famous Jewish authors and Aristotelian philosophers. He wrote extensively upon astronomical and astrological matters, the latter of which he opposed, unlike many of his fellow exegetes. In a section of his *Mishneh Torah* entitled *Hilkhot Kiddush Ha-Hodesh*, or *New-Moon Sanctification*, Maimonides elaborates on the astronomical and calendrical content of Exodus 12:1-2. Addressing new moon observations, Maimonides writes that the witnessing is to be entrusted only to the Sanhedrin court, which must sanctify the day. Later on in his treatise, the Rambam explains the principles of calendrical intercalation, writing that the fixing of *Rosh Hodesh* by means of observing the new moon only applies when said Sanhedrin exists. In the absence of this rabbinical court, the new moon and leap years are to be fixed only by calculation.¹⁹

Ashkenazim on Exodus: tenth to thirteenth centuries CE

A. Early Rashi (Rabbi Shlomo ben Yitzhaki) (1040–1105 CE)

Born in Troyes, France, Rashi was a prolific exegete whose main goal was to produce a commentary that would explain the Biblical text in the clearest possible way. Referring to Exodus 12:1-2, Rashi's commentary upon the book of Genesis 1:1 asserts the primacy of the spring equinox and its relationship to the commandment to observe the moon, asserting that the Torah (Pentateuch) should have begun not with 'In the beginning', but with the verse 'This month shall be your first month'.²⁰

¹⁸ Norman H. Strickman and Arthur M. Silver, *Ibn Ezra's Commentary on the Pentateuch*. Exodus (Shemot) (New York: Menorah Publishing Company, Inc., 1996), p. 206.

¹⁹ Philip Birnbaum, ed., *Maimonides' Mishneh Torah (Yad Hazakah)*. (New York: Hebrew Publishing Company, 1985), p. 97.

²⁰ Avrohom Davis, trans., *The Metsudah Chumash/Rashi*. Volume I: Bereishis. (Hoboken, NJ: Ktav Publishing House, Inc., 1991), p. 1.

B. Late Tosafists (twelfth to thirteenth centuries CE)

Here, a brief mention must be made regarding the *Tosafot*, or *supplements* to Rashi's commentary, which served as a record of various scholars' comments upon Rashi's text. Addressing the Talmud tractate *Rosh Hashanah 27a*, which itself comments on Exodus 12:1-2, *Tosafot* write that the birth of the creation of the world occurred during Nisan, whereas the conception of the world took place during Tishrei (Libra).²¹

Conclusion

This paper summarized the varied astronomical commentaries upon Exodus 12:1-2. It is hoped that these historico-literary perspectives may provide a sufficiently broad overview of the interpretive literature, and inspire further research into the points of interconnection that exist between religious literatures and the field of astronomy.

²¹ Matityahu Glazerson, *Above The Zodiac: Astrology in Jewish Thought* (Northvale, NJ: Jason Aronson Inc., 1997), p. 7.

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