

THE ANCIENT ISRAELITE CALENDAR

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I. INTRODUCTION

This essay asks what kind of calendar would have been used by ancient Israel from the time of its inception in the second millennium BC through the Second Temple period and explores the extent to which it was still utilized in the early centuries of the Common Era. Days, months, and years are the building blocks of calendars; understanding how divisions were made between them is crucial. How did the Israelites distinguish between the end of one month and the beginning of the next? What phenomenon signalled the end of their day? And what criterion determined when the twelfth lunar month fell too short of the solar year, thus requiring the insertion of a thirteenth month?

The dearth of definitive treatments of this subject may reflect a perception on the part of some calendar specialists that biblical references to ancient Israel's calendar are sporadic and imprecise.¹ If Israel's system of calendation can be discerned, however, there is potential to use lunar astronomy as a means of assigning absolute (e.g., Julian) dates to events, with the goal of authenticating a biblical timeline, much as Egyptologists have used lunar dates to argue for one chronology over another.² In principle, if a text designates a day

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¹Sacha Stern (*Calendar and Community: A History of the Jewish Calendar, 2nd Century BCE to 10th Century CE* [Oxford: Clarendon, 2001], 2) thinks sources before 200 BC are "remarkably uninformative about the calendar. Although the dates of annual festivals and of historical events are frequently given in biblical sources, the Bible has no apparent interest in explaining how these dates were reckoned." With regard to intercalation, Judah B. Segal ("Intercalation and the Hebrew Calendar," *VT* 7 [1957]: 251) speaks of the "paucity of direct information in the Bible." For a bibliography of Hebrew calendar studies, see Charles Blanco, "Aspects of the Calendar of the Hebrew Bible and its Theological Significance," Master of Sacred Theology Thesis, Concordia Seminary, 1990, <https://scholar.csl.edu/cgi/viewcontent.cgi?article=1030&context=stm>.

²It is the intersection of Egyptian civil-dates with the phase of the moon that enable us to assign Julian dates to Egypt's lunar dates (Richard Parker, *The Calendars of Ancient Egypt*, SAOC 26 [Chicago: University of Chicago Press], 15, passim). Rita Gautschi understands that it is largely lunar dates that enable Egyptologists to test the accuracy

of the lunar month, and perhaps even a day of the week, and other chrono-historical data are sufficient to narrow the window of time to thirty or forty years, then lunar visibility tables may be consulted in support of a Julian date.³ This is a fundamental means of fine-tuning historical and chronological reconstructions, but only practicable if a culture's calendrical conventions have been ascertained.

It may be argued that early Israel's calendar had much in common with those of other cultures in the ancient Near East, and that calendars, like regnal reckoning systems,⁴ were very stable and changed little over time. For example, Egypt's civil calendar, with its annual quarter-day inaccuracy, could easily have been adjusted by the insertion of a sixth epagomenal day every four years; yet this calendar remained unchanged for nearly three thousand years.⁵ Shlomo Sternberg states: "The one striking common thread in the most primitive observations of the heavens is that events occur in cycles," the most obvious of which are "the day, the month, and the year."⁶ Not counting the ephemeral schematic calendar of the small sect at Qumran, it is safe to say that Israel for millennia has known only two types of calendars—empirical and fixed (calculated).⁷ The fixed calendar of modern Judaism evolved between the third and eighth centuries AD. The durability of its predecessor, the empirical lunisolar

of absolute dates assigned to pharaohs ("A Reassessment of the Absolute Chronology of the Egyptian New Kingdom and its 'Brotherly' Countries," *Egypt and the Levant* 24 [2014]: 141). For application of this methodology see, for example, Richard Parker, "The Lunar Dates of Thutmose III and Ramesses II," *JNES* 16 (1957): 39–43; Rolf Krauss, "Lunar Dates," in *Ancient Egyptian Chronology*, ed. Erik Hornung, Rolf Krauss, and David A. Warburton (Leiden: Brill, 2006), 395–431; Edward F. Wente, "Thutmose III's Accession and the Beginning of the New Kingdom," *JNES* 34 (1975): 265–72; Philip Derstine, "The Start of the Egyptian Lunar Month in Light of Early Eighteenth Dynasty Sothic and Lunar Dates," *Göttinger Miszellen* 249 (2016): 39–57; idem, "Early Eighteenth Dynasty Chronology and Thutmose Succession," *Göttinger Miszellen* 252 (2017): 41–59.

³The latest refinements in lunar crescent visibility are reflected in Rita Gautschy, "Last and First Sightings of the Lunar Crescent," <http://www.gautschy.ch/~rita/archast/mond/mondeng.html>. See also, idem, "Monddaten aus dem Archiv von Illahun: Chronologie des Mittleren Reiches," *ZÄS* 178 (2011): 1–19.

⁴Hayim Tadmor, "Chronology of the First Temple Period," in *The Age of the Monarchies: Political History, The World History of the Jewish People* 4/1, ed. Abraham Malamat and Israel Eph'al (Jerusalem: Masada, 1979), 50.

⁵Sacha Stern, *Calendars in Antiquity* (Oxford: Oxford University Press, 2012), 13.

⁶Shlomo Sternberg, "Introduction," in Solomon Gandz, *Studies in Hebrew Astronomy and Mathematics* (New York: KTAV, 1970), xi.

⁷When explicating the Jewish calendar, Stern in his indispensable monographs (*Calendar and Community*; *Calendars in Antiquity*) primarily concentrates on calendars that were in use from 200 BC onward. The present essay focuses on calendrical principles that were in continuous use from the time of Israel's seminal events in the second millennium into Late Antiquity. In *Calendar and Community*, Stern evaluates various theories about the Jewish calendar, such as whether it was originally solar or lunar, whether the second century BC 364-day calendar in the *Book of Jubilees* had an earlier existence, and whether the 364-day schematic calendar was used at Qumran. The solar calendars mentioned in the books of Enoch, Jubilees, and texts found at Qumran were not empirical, but schematic, and were not widely observed (Stern, *Calendar and Community*, 4). They are, by and large, irrelevant to this study.

calendar, is reflected in the fact that the communities of the Diaspora—independent of the Palestinian rabbinic court's decisions—retained their own traditional methods of calendation.⁸ Their “conservatism in this sphere argues for an ancient tradition—mak[ing] the hypothesis of a Hebrew lunar calendar well-nigh unassailable.”⁹

The gamut of Talmudic literature takes for granted the validity of the sighting of the first evening crescent as the criterion for the beginning of the month.¹⁰ However, from the time of the Mishnah through the tenth century AD, the rabbinate in Palestine and Babylon sought to convince Jews of the Diaspora the importance of human authority for setting the new month, as though local Jewish communities had no business relying on their own traditional methods. The Mishnah (AD 170–220) indicates that the formal “sanctification of the new month” was “done on the strength of actual observation,” which points to an empirical system.¹¹ Some believe the special calendar court, whether it existed or not, was introduced as a means of convincing others that rabbinic affirmation of an observation was more important than the sighting itself, ergo, sacred time was now determined by humans, not by nature.¹² The rabbinical court (*beit din*) was given sole authority to regulate the calendar and thereby “control the very existence of the Festivals.”¹³ This was an important milestone toward the development of a Jewish calendar based exclusively on calculation.¹⁴

The challenge of precalculating future first evening crescent visibilities with any kind of consistency led in the fourth century AD to calculation of lunar conjunctions (*molads*) as a means of defining new months. Prior to this there are lunar dates that point to the use of empirical criteria in a light-based system. For instance, the intersection of data from Josephus and the *Seder Olam* indicates that the Second Temple was burned on the eighth day of Lous—the Macedonian month corresponding to Ab, the fifth month—in AD 70. This month began on July 28, the first crescent being visible the previous evening (July 27).¹⁵ Eight days later, on August 4, a Sabbath, Titus gave the order to set fire to the outer court of the temple (*J.W.* VI, iv.1–2).¹⁶ This

⁸Stern, *Calendar and Community*, 83, 143–44. Evidence, some from private correspondence, indicates that universal acceptance of the fixed calendar came about in the tenth or even eleventh century AD (Stern, *Calendars in Antiquity*, v–vii, 4).

⁹Segal, “Intercalation and the Hebrew Calendar,” 253.

¹⁰See Aaron Rothkoff, “New Moon,” *EncJud* 15:150–51.

¹¹Sacha Stern, “Rachel Elior on Ancient Jewish Calendars: A Critique,” *Aleph* 5 (2005): 291–92; b. Ros. Has. 20a.

¹²Ron H. Feldman, “‘On Your New Moons’: The Feminist Transformation of the Jewish New Moon Festival,” *Journal of Women and Religion* 19 (2003): 28; Magdel le Roux, “African Light on the New Moon Ceremony,” *OTE* 18.2 (2005): 288.

¹³Feldman, “On Your New Moons,” 31.

¹⁴*Ibid.*, 28.

¹⁵Gautschi, “Last and First Sightings.”

¹⁶Further confirmation comes from *The Seder Olam* (Heinrich W Guggenheimer [New York: Rowman & Littlefield, 1998], 264), where we learn this destruction occurred

date was indeed eight days after the first crescent visibility of July 27.¹⁷ This is just one demonstration of the value of lunar visibility tables as a witness to the credibility of astrocalendrical data in ancient sources.

II. THE EMPIRICAL NATURE OF THE ISRAELITE CALENDAR

Principles discernible in the books of Genesis and Exodus allow us to posit an archetype for an empirical festival calendar at the earliest stage of Israelite history—one that would have had a great deal in common with the empirical calendars of other cultures throughout the Near East. Exodus 12:2, 23:16, and 34:22 further amplify this calendar, whose light-based fundamentals are introduced in Gen 1:14–16 and 2:2–3.¹⁸ The present study will demonstrate that this calendar employed the following criteria: (1) the literal entry of the sun into the western horizon for the start of the day, conveyed by *כָּא הַשֶּׁמֶשׁ* (“the entry of the sun”) (2) the sighting of first evening crescents for the start of months,¹⁹ and (3) the estimation of the spring equinox for bringing the lunar year back into alignment with the solar year, since the occasional insertion of a thirteenth month was necessary in order to cause the three main harvest feasts of Israel to synchronize with the barley, wheat, and grape harvests.

The creation account in Gen 1:14–15 uses language understood for its relevance to a light-based system of calendar reckoning that is unrelated to the lunar conjunction, when the moon is invisible. It reads: “Let there be lights in the expanse of the heavens ... and let them be for signs, even for the set times of sacred assembly [וּלְמוֹעֲדִים],²⁰ and for days and years.” The *waw* before the phrase *לְמוֹעֲדִים* may be understood as appositional, since the sun rules both the day and the

at the time of the going out of a weekly Sabbath, when Jehoiairib, the first of the 24 priestly courses (see 1 Chr 24:1–7, 8–18), had come on duty. This Sabbath day is said to be at the going out of a Land Sabbath year. The data of Josephus and the Seder Olam thus specify a Sabbath—when the priestly courses changed over—that coincided with the eighth day of the fifth lunar month, Ab. This Sabbath must be 48 weeks after the New Year for the priestly courses. For clarification of the latter, see Roger T. Beckwith, *Calendar and Chronology, Jewish and Christian* (Leiden: Brill, 2001), 81–91. For the calendar of Land Sabbath years, see Ben Zion Wacholder, “Chronomessianism: The Timing of Messianic Movements and the Calendar of Sabbatical Cycles,” *HUCA* 46 (1975): 201–18. These timelines and cycles converge on AD August 4, 70 (8th day of Ab).

¹⁷Gautschi, “Last and First Sightings.” From this information it may further be deduced that AD Nisan 1, 69 was on March 13, nine days before the spring equinox.

¹⁸For the terminology of Gen 1:4, 6, 7, 14a–b, 18; and 2:2–3, as introducing the Code of Holiness, with perhaps deliberate links to Lev 10:10; 11:47, and the festival calendar of Lev 23, see Bill T. Arnold, “Genesis 1 as Holiness Preamble,” in *Let Us Go Up to Zion*, ed. Iain W. Provan and Mark J. Boda (Leiden: Brill, 2012), 336–37, 339–42.

¹⁹Francesca Rochberg-Halton (“Calendars, Ancient Near East,” *ABD* 1:810) states: “The lunar month was taken uniformly throughout the ancient Near East and Mediterranean (by Sumerians, Babylonians, Assyrians, Hebrews, Arabs, and Greeks) to begin with the sighting of the first visible lunar crescent.” The lunar calendar only came to be seen as distinctive to Judaism after the Julian calendar began to dominate the Roman empire after AD 44.

²⁰*מוֹעֵד*, derived from the root *יָעַד*, can, with different vowel points, refer to the place of assembly.

year, including the matter of when a thirteenth month must be added to keep festival months in season (see below).²¹ The plural form of **מוֹעֵד** always refers to Israel's festivals.²² The author of Gen 1:14–16 is framing “the calendrical purpose of the luminaries,”²³ as explained by Bill Arnold:

It seems likely that the author of Gen 1 has set out intentionally to distinguish Israel's use of these phenomena as marks of sacred festivals from the Babylonian focus on divinatory readings of the signs. In Gen 1, the signs of heaven have been transformed from divinatory guidelines to be read by the well-informed into a sacred calendar in the sky on display for all Israelites to follow.²⁴

The Hebrew **אוֹתֹת** (“signs,” Gen 1:14a) is thus a broad category under which the rest of the terms of this calendar fall. It signifies that which is seen with the eyes (see Exod 4:8–9, 30; 7:3; Num 14:11; Deut 13:1–2; Judg 6:17; Jer 10:2). Twice it is used in connection with sacred festivals (Exod 13:9; 31:13). In Exod 12:13, Yahweh assures Israel that when the sign of the blood is seen on their doorposts, he “will pass over” the Israelites. Every use of **אוֹתֹת** connotes something empirical.²⁵ Hence it was the ideal rubric under which to lay out the parameters of the divine calendar.

Precalculation of lunar conjunctions in perpetuity by the fixed calendar of Judaism in the Middle Ages supplanted the statutory imperative of Deut 16:1: “You shall observe or watch for the new moon of Aviv” (**שָׁמֹר אֶת הַחֹדֶשׁ**).²⁶ One cannot fulfill this perennial obligation one year or one hundred years ahead of time. In Jer 31:35, the word for “statutes” (**חֻקִּים**) enshrines the role of the lunar and stellar luminaries, whose light is instrumental in conveying the set time for offering Yahweh's sacrifices (see Num 9:6, JPS).²⁷ The stars

²¹As translated by an Aramaic targum: “let them serve as signs and as festival times, and for counting the reckoning of days, and for sanctifying the beginnings of months and the beginnings of years” (Tg. Ps.-J., ArBib 1B, trans. M. Maher [Collegeville, MN: Liturgical, 1992]).

²²David J. Rudolph, “Festivals in Genesis 1:14,” *TynBul* 54 (2003): 40.

²³Philippe Guillaume, *Land and Calendar: The Priestly Document from Genesis 1 to Joshua 18*, LHBOTS 391 (New York: T&T Clark, 2009), 47.

²⁴Arnold, “Genesis 1 as Holiness Preamble,” 340–41.

²⁵Prophets give signs as pledges of predicted events (1 Sam 10:7) — **אוֹתֹת** is used of miracles confirming the divine presence, such as Moses's ability to stop and start leprosy or turn the waters of the Nile into blood (Exod 4:6–9). The word **אוֹת** describes the stone each tribe placed at the Jordan as a memorial of the parting of the Jordan (Josh 4:5–7). For additional examples, see BDAG 16.

²⁶The verb **שָׁמֹר** has various connotations, especially in connection with the careful observance of the Sabbath (Exod 31:14) and other laws of the Covenant; but it also signified “to watch out for trouble, to guard someone or something,” such as the gate or walls of a city. All its actions are ultimately fulfilled in the present.

²⁷Adele Berlin and Marc Zvi Brettler, eds., *The Jewish Study Bible* [JPS], Jewish Publication Society, Tanakh translation (Oxford: Oxford University Press, 1999). The first crescent moons were commemorated with the blowing of trumpets (Num 10:10) and with specified offerings at the Tabernacle (Num 28:11–15). Numbers 9:12–13 suggests how seriously Yahweh took punctilious observance of statutory requirements.

and the moon are pivotal in setting the correct time for the festival days themselves (cf. Ps 104:19²⁸). The role of the stars (see Gen 1:16b) will be discussed below. The light of the moon is Yahweh's faithful perennial witness in the skies (Ps 89:37), its "speech" capable of broadcasting to the world an inaudible source of knowledge (Ps 19:2-4). The new moon made the essence of the lunar calendar accessible to anyone desiring to keep the festivals far from Jerusalem. Moreover, the practice conveyed a divine sense of unity and moment that predetermined calendars cannot.²⁹

The word **חֹדֶשׁ** originally meant "the shining, glittering new moon."³⁰ This continued to be its primary meaning in Jewish midrashic tradition, so that **חֹדֶשׁ** in Exod 12:2 was understood to mean "new moon" rather than "month." This yields the following: "This new moon shall be the first new moon of the year for you." Rashi accounts for modification of **חֹדֶשׁ** by the demonstrative adjective **הַזֶּה** in terms of God didactically pointing his finger at the first new moon of the year.³¹ This concept would have been familiar to Moses, because—though not generally recognized—it was no later than early Dynasty Eighteen that the Egyptians made use of the first visible crescent to solemnize a wide variety of important royal and cultic events.³²

Philo,³³ a spokesman for the normative Judaism in the time of Christ,³⁴ described the Jewish new moon as follows: "Now the third [festival] is that which comes *after the conjunction* [μετὰ σύναδον], which happens on the day of the new moon in each month [κατὰ σελήνην νέαν]."³⁵ In the same book, Philo is even more explicit: "At the time of the new moon, the sun begins to illuminate the moon with a light which is visible...."³⁶ The Hebrew word for "new moon" (**חֹדֶשׁ**),

²⁸The word "seasons" (KJV, NASB, ESV, NIV) is a faulty translation of **לְמוֹעֲדִים**, which always denotes festivals.

²⁹Yet Solomon Gandz ("Studies in the Hebrew Calendar (Continued)," *JQR* 40.3 [1950]: 251) alleges that the Hebrew Scriptures have left "us in complete darkness about the method by which the new moon was established."

³⁰Gandz, "Studies in the Hebrew Calendar: A Study in Terminology," *JQR* 39 (1949): 260.

³¹The use of **הַזֶּה** to modify **בָּיֹום** in Exod 19:1 (ESV) also yields "new moon": "On the third new moon after the people of Israel had gone out of Egypt, *on that day* they came into the wilderness of Sinai."

³²Derstine, "The Start of the Egyptian Lunar Month"; idem, "Early Eighteenth Dynasty Chronology."

³³Philo (ca. 20 BC–AD 50) was a descendant of Aaron from Alexandria. His brother headed the Jewish community in Alexandria, which was represented by Philo as part of a delegation sent to Caligula in AD 40 (Josephus, *A.J.* 18.8.1).

³⁴Judaic scholar Harry A. Wolfson concluded that Philonic Judaism was largely a derivative of Pharisaic Judaism (*Philo: Foundations of Religious Philosophy in Judaism, Christianity, and Islam*, vol. 2 [Cambridge: Harvard University Press, 1947], 6–8).

³⁵Philo, *Spec. Laws* 2.41 (Charles D. Yonge, trans., *The Works of Philo* [Peabody, MA: Hendrickson, 1993], 572). **Σελήνην νέαν** and **νουμηνία** in *Spec. Laws* 2.41 are used synonymously to refer to the first day of the Jewish lunar month. In the Rosetta Stone, **νουμηνία** refers to the first day of the Egyptian civil month Thoth (Leo Depuydt, *Civil Calendar and Lunar Calendar in Ancient Egypt* [Leuven: Peeters, 1997], 154).

³⁶Philo, *Spec. Laws* 2.140.

in several contexts refers to the first day of a Hebrew month (Exod 12:2; 19:1; Num 28:14; Deut 16:1), a meaning mirrored by Philo's use of σελήνη νέαν. Philo's statement bridges the Second Temple period and much later rabbinic writings which also understood "the moon begins to shine on the first of the month."³⁷

Neither the biblical authors nor the rabbinic sages cited in the Mishnah or Talmud ever contemplated the validity of an invisible astronomical new moon.³⁸ The ability to calculate lunar conjunctions was a product of the Babylonian astronomers' attainment of the scientific acumen to predict lunar eclipses (ca. 550 BC).³⁹ The earliest Jewish astronomical work is the Enochic *Astronomical Book*, a Jewish Palestinian text in Aramaic from the third century BC. The level of astronomical expertise in this work hearkens back to much earlier examples in Mesopotamia from the first half of the first millennium BC. It fails to "reflect developments that occurred in Mesopotamian astronomy from the middle of the first millennium onward," such as the use of mathematical models that enabled the Babylonians to predict the recurrence of eclipses and other heavenly phenomena.⁴⁰ From this, recent scholarship has argued that early Jewish sources did not benefit from refinements in astronomical science in Babylon and Jewish scholars did not have direct access to Babylonian centers of higher learning during the second half of the first millennium BC.⁴¹ It is widely conceded that calculation of mean lunar conjunctions played no role in determining Hebrew months prior to the innovation of the fixed calendar in the time of Hillel II (mid-fourth century AD). Instead, the sighting of the first evening crescent remained standard practice in most diaspora communities well into the Middle Ages.

Vestiges of ancient Israel's celebration of the new moon may linger on in southern Africa. The priests of the Lemba people claim lineage from Israelite stock and believe they migrated to southern Africa via the Arabian Peninsula.⁴² A "few informed leaders maintain this happened around 586 BC."⁴³ Magdel le Roux, ethnographer of the Lemba, sees "a very strong indication of an earlier correlation between

³⁷E.g., Exod. Rab. 15.26.

³⁸See, for instance, b. Roš Haš. 21b–25b.

³⁹John M. Steele and F. Richard Stephenson, "Lunar Eclipse Times Predicted by the Babylonians," *Journal for the History of Astronomy* 28 (1997): 119–31.

⁴⁰Mladen Popović, "Networks of Scholars: The Transmission of Astronomical and Astrological Learning between Babylonians, Greeks, and Jews," in *Ancient Jewish Sciences*, ed. Jonathan Ben-Dov and Seth L. Sanders (2014), <http://dlib.nyu.edu/awdl/isaw/ancient-jewish-sciences/chapter7.xhtml>. The Egyptians only acquired the ability to calculate lunar conjunctions via astronomically savvy Greeks who migrated to the new city of Alexandria in the late fourth century BC (Otto Neugebauer, *A History of Ancient Mathematical Astronomy* [New York: Springer, 1975], 3:559–63).

⁴¹Popović, "Networks of Scholars."

⁴²Le Roux, "African Light," 291.

⁴³Magdel le Roux, "Lemba Religion: Ancient Judaism or Evolving Lemba Tradition?," *R&T* 11.3&4 (2004): 313.

the culture of the Lemba and that of early Israel."⁴⁴ Genetic studies support the Lemba's claims to Israelite ancestry.⁴⁵ Their Hebraic customs—including circumcision, unclean meat taboos, and their practice for sighting and celebrating the new moon—have been retained over many centuries by means of oral tradition.⁴⁶ After the first visible crescent is sighted during a distinctive ritual, the Lemba blow trumpets and horns and observe a day of rest, reminiscent of Num 10:10 and Amos 8:5a.⁴⁷ According to Le Roux, "The specific description of how the actual sighting of the new moon takes place in Lemba culture is unique and is a great contribution to the understanding of this Old Testament custom."⁴⁸

III. INTERCALATION AND THE RULE OF THE EQUINOX

Intercalation, as practiced in Israel, is the insertion of a thirteenth month⁴⁹ (Adar II) at the end of the year (usually in March) to keep the start of the first lunar month of Aviv (or, postexilic, "Nisan")—within which the Feast of Unleavened Bread was observed (Lev 23:5–8)—from falling more than one month behind the solar year. This feast is inextricably connected with the Wavesheaf offering (Lev 23:9–14) by a passage in Josh 5:11, which says the Israelites ate unleavened bread along with the "new produce" (עֲבִיר) of the land on the morrow after the Passover. Since the new grain could not be consumed until the Wavesheaf ceremony, it was, according to Segal, "desirable ... [and] necessary that the adjustments required to bring the lunar reckoning into accord with the tropic year should be made before the ceremonies which precede the harvest," a reference to the Wavesheaf.⁵⁰

There is reason to believe that the ancient Israelite system, especially the Wavesheaf ceremony, tacitly took for granted that some barley would always ripen by the time of the equinox, just as it had up and down the Nile in Exod 9:31, several weeks before the Passover. A subtropical climate, similar to Egypt's, prevailed in late winter in the Jordan depression and regions west of the Dead Sea. Both lay in Judea, the preferred locale for harvesting the firstfruits (קְצִירָם), "ראשית", "the first-picked harvest," Lev 23:10; t. Sanh. ii.3). Modern barley reports in all parts of Israel, let alone the hotter regions of the Negev and Jordan, indicate that barley fields consistently display

⁴⁴Le Roux, "Lemba Religion," 323. Le Roux views their social and religious practices as "pre-Talmudic."

⁴⁵Mark G. Thomas et. al, "Y Chromosomes Traveling South: The Cohen Modal Haplotype and the Origins of the Lemba—the 'Black Jews of South Africa,'" *American Journal of Human Genetics* (2000): 674–86.

⁴⁶Magdel le Roux, *The Lemba: A Lost Tribe of Israel in South Africa?* (Pretoria: UNISA, 2003).

⁴⁷Le Roux, *The Lemba: A Lost Tribe*, 292.

⁴⁸Le Roux, "African Light," 294.

⁴⁹Below, we will see that the Babylonians inserted a second sixth month, Ululu II.

⁵⁰Segal, "Intercalation and the Hebrew Calendar," 264. According to Segal, similar rituals were prevalent among other people groups that employed a lunisolar calendar.

some degree of ripeness by early to mid-March.⁵¹ Since the fresh ears of barley could not be consumed until after this New Year harvest ceremony, this lent a strong incentive “to celebrate the Passover at the earliest date at which one sheaf of barley could be obtained.”⁵² For this reason, Segal states that “it must on no account fall too late.”⁵³ The sun virtually guaranteed the omer of barley needed for the Wavesheaf by the time of the equinox, which was the cut-off point for the rule of the equinox, the earliest date when Passover could fall.

This view is at odds with Stern, who argues that “intercalation of a 13th month in the ancient Jewish lunar calendar was not regulated by the solar year (e.g., by the equinox) but instead by ... seasonal/agricultural criteria such as *’aviv*, and thus was only *indirectly* related to the solar year” and surmises that “many ancient sources (e.g., rabbinic) consider the Jewish calendar to be based on the moon and hence only ‘lunar.’”⁵⁴ Hence, he considers the term “lunisolar” a misnomer. However, if the state of barley (אֶבִיב, *’aviv*) was the Mosaic criterion for setting the first month, then why is *’aviv* missing in Exod 12:2? The term is used four times of the month when Yahweh delivered Israel from Egypt (Exod 13:4; 23:15; 34:18; Deut 16:1), yet is absent from Exod 12:2; 23:16; 34:22; and other passages that stipulate when the feasts are observed. Since climatic conditions in Canaan yield maturity dates that differ as much as six weeks, Segal rejected the barley status as a guide to intercalation.⁵⁵

Contra Stern, the equinoctial or solstitial criterion for governing the head of the year is inferred by the sun’s role in determining festivals found in Gen 1:14. Genesis 1:16 adds, “God made two great lights, the great luminary to *govern* the day” (author’s translation). The only way for the sun to rule the year and “govern” (לְמַשְׁלָה) the time of the festivals in the light-based calendation system of Gen 1:14–16 is if the start of the solar year is pegged to an equinox or solstice. The temporal context of Exod 12:2 and the original Passover reduces options to the spring equinox. Thus, it is safe to assume the earliest calendar of Israel was indeed lunisolar.

⁵¹Many of these observers keep the Jewish feasts and intercalate based on the barley crop. Ripe barley by mid-March goes contrary to the assumption of Grace Amadon (“Ancient Jewish Calendation,” *JBL* 61 [1942]: 229, 241–42), who ruled out Passovers in March, “when the new fruits could not possibly be ripe in Palestine.” Thus, she opted for April 27 over March 27 for the Passover date in AD 31 (p. 232). But April 27 is too late in the season to account for the nighttime chill described in John 18:18 (cf. Mark 14:54; Luke 22:56) and is 16 (not 14) days after the New Moon.

⁵²John K. Fotheringham, “The Evidence of Astronomy and Technical Chronology for the Date of the Crucifixion,” *JTS* 35 (1934): 157.

⁵³Segal, “Intercalation and the Hebrew Calendar,” 266.

⁵⁴Stern, *Calendar and Community*, 1–2. However, the Seder Olam sees Gen 1:14–16 and the dates in the flood account (Gen 7:11; 8:13–14) as indicators of lunisolar reckoning of the year, as recognized by Ben Zion Wacholder and Sholom Wacholder, “Patterns of Biblical Dates and Qumran’s Calendar: The Fallacy of Jaubert’s Hypothesis,” *HUCA* 66 (1995): 26.

⁵⁵Segal, “Intercalation and the Hebrew Calendar,” 265–67.

Importantly, Gen 1:16b adds “the stars also.” This is probably a reference to certain constellations later mentioned by Philo and Josephus in connection with the spring and fall feasts. The role of these constellations in governing the festival calendar is generally overlooked. Philo placed the Feast of Tabernacles within the month of the fall equinox, during the equinoctial sign of Libra (Sept 23–Oct 23).⁵⁶ The same passage in Philo assigns the Passover feast to the spring equinox, when the sun is in the equinoctial sign of Aries (March 23–April 22).⁵⁷ The Passover of AD April 19, 37 (below) fell within this period, paralleling Josephus’s statement that Israel’s Exodus took place “on the fourteenth day of the lunar month, when the sun is in Aries.”⁵⁸

Like many other ancient cultures, at the start of Dynasty Eighteen the Egyptians were capable of estimating equinoxes via water clocks that measured the shortest and longest days of the year (solstitial points), from which the months embracing the equinoxes could be calculated.⁵⁹ Segal understood that the fixing of solstice dates enabled cultures throughout the Middle East “to fix the occurrence of the equinoxes in an average year.”⁶⁰ Thus, given the right instruction, periodic intercalary adjustments were not beyond the capabilities of a tribal people like the early Israelites. Far more primitive, even prehistoric cultures, have used observation to determine the onset of spring.⁶¹ The coincidence of the ripening barley with the spring equinox made the latter a regulating and starting point in the calendar of Israel.⁶² Moses’s royal education (Exod 2:10) would have familiarized him with the wisdom of the Egyptians (Acts 7:22) and his exposure to Egyptian science bears on his ability to understand the instruction given him on Aviv being “the head of the months of the year” (Exod 12:2).⁶³

⁵⁶Philo (*Opif.* 1.116) states that the Feast of Tabernacles occurs when the sun is in the equinoctial sign of Libra (Sept 23–Oct 23).

⁵⁷According to Stern (*Calendar and Community*, 54), the beginning of Aries has always been, even until this day, the “traditional astronomical designation of the spring equinox.”

⁵⁸Josephus, *A.J.* 3.10.5; compare Philo, *Opif.* 1.116.

⁵⁹For discussion of Egyptian clocks, see Marshall Clagett, *Ancient Egyptian Science (Vol. II): Calendars, Clocks, and Astronomy* (Philadelphia: American Philosophical Society, 1995), 37, 68, 73–74, 78, 86–87, 89. It is well-known that most of the pyramids were oriented precisely according to the cardinal directions (east-west/north-south). Clagett points out that some clocks were less accurate in measuring the equinoctial points than others. Shadow clocks could measure directly the months or even days of the equinoxes (*ibid.*, 73–74, 78, 86, 89). Philo (*Spec. Laws* 4.233) defined equinox as an equality of night and day.

⁶⁰Segal, “Intercalation and the Hebrew Calendar,” 263. Similarly, Anton Pannekoek (*The History of Astronomy* [New York: Interscience, 1961], 73–74) states that the spring and fall equinoxes were determined by the Babylonians as “medium points between the solstices.”

⁶¹Pannekoek, *A History of Astronomy*, 22, 31.

⁶²Segal, “Intercalation and the Hebrew Calendar,” 264.

⁶³The later rabbinic fixed calendar set aside Aviv’s headship of the year by making the *molad* (the lunar conjunction) of Tishri the head of the year (רֵאשׁ הַשָּׁנָה). Philo flatly

Philo tied Israel's two greatest festivals to the vernal and autumnal equinox and to the first and seventh month.⁶⁴ Exodus 34:22 establishes the observance of Israel's fall feast with language that can only be understood in terms of an equinoctial fulcrum of the solar year. In Exod 34:22, Israel is told to "celebrate ... the Feast of Ingathering at the *tēqûfat haššānâ* (תְּקִיפַת הַשָּׁנָה)," language indicating an equinoctial "extremity or turning point of the solar year." The phrase is translated "at the year's end" (KJV, ASV, ESV), "at the turn of the year" (JPS, NIV, NET, CJB⁶⁵), "at the revolution of the year" (YLT⁶⁶), and "middle of the year" (LXX). Since one year ends at the same place where another begins (i.e., Exod 12:2), the KJV's "year's end" conveys the correct idea of a turning point. *Tēqûfat haššānâ* occurs two times, Exod 34:22 and 2 Chr 24:23. In 2 Chr 24:23, Syria's army invades Judah, "at the turning point of the year." This time of year, "when kings go out to battle," is elsewhere (1 Chr 20:1 = 2 Sam 11:1) described by the phrase *le'ēt tēšûbat haššānâ* (לְעֵת תְּשׁוּבַת הַשָּׁנָה, "toward the time of the return of the year"), typically associated with early spring.⁶⁷ When referring to absolute points of the solar year, *tēšûbat haššānâ* and *tēqûfat haššānâ* appear to be synonymous terms for turning points. It is probably no coincidence that the two junctures in the solar year referenced in Hebrew Scripture by תְּקִיפַת הַשָּׁנָה happen to be 180 degrees removed from one another. Hence these phrases are not as vague as most scholars imagine. This may then be posited as the basis for the Philonic and rabbinic references to four *tequfot* turning points of the year.⁶⁸

The translators of the LXX took the reference to the equinox in Exod 34:22 as the mid-point of the year — μεσοῦντος (from μεσώω, "to be in the middle"). The author of t. Sanh. 2:7 believed the phrase,

rejected this, stating that the month of the autumnal equinox is "not considered first in the law" due to the fact that "the hill country and the plain become barren and infertile" (Philo, *Spec. Laws* 2.153). The late and artificial nature of the rabbinic calendar is thus manifest by this convention.

⁶⁴Philo, *Opif.* 116; *Decal.* 161; *Flacc.* 116.

⁶⁵David H. Stern, *The Complete Jewish Bible: an English version of the Tanakh and B'rit Hadashah* (Clarksville, MD: Jewish New Testament Publications, 1998); hereafter CJB.

⁶⁶Young's *Literal Translation of the Holy Bible* (Lafayette, IN: Greater Truth Publishers, 2004); hereafter YLT.

⁶⁷The parallel account in 2 Sam 11:1 uses a nearly identical phrase, לְתְשׁוּבַת הַשָּׁנָה. For early spring as the typical time when, according to cuneiform documents in Mesopotamia, kings went out to war, see Louis Levine, "Sennacherib's Southern Front: 704–689," *JCS* 34 (1982): 35. The same phrase occurs in 2 Chr 36:10, where it refers to Nebuchadnezzar's capture of Jehoiachin, dated 16 March 597 BC (*Bab. Chron.* 5.11; see below). It must be noted that תְּשׁוּבַת הַשָּׁנָה is around Adar or Nisan 1, not Elul, the sixth month, as is the case in rabbinic Judaism.

⁶⁸The other two turning points being solstitial. See R. Shemuel (b. Ber. 59b:2, 8, and n. 2; b. Erub. 56a:15–16). According to Stern (*Calendar and Community*, 258), Shemuel, in the mid-third century, was able to calculate equinoxes and solstices (*tequfot*) over the course of 60 years. See also Maimonides, *Sanctification of the New Moon* 9:2–3. The lunar cycle also had תְּקִיפַת. Sirach 43.7 refers to the full moon as תְּקִיפַת; the Greek version renders this συντελεια, a point of time marking the end of a fixed time period (cf. Matt 13:40, "the end of the age") (Johannes P. Louw and Eugene A. Nida, *Greek-English Lexicon of the New Testament*, 2nd ed. [New York: United Bible Societies, 1989], 1:638).

תְּקִיפַת הַשָּׁנָה, in Exod 34:22, referred to the fall equinox,⁶⁹ which reflects the idea that the sun ruled the year and the festival calendar by means of the equinoxes. The extra sixth month (Ululu II), added in late summer about 26 times by the Babylonians and Persians (Nabopolassar to Darius III),⁷⁰ dislodges Tishri from its midpoint in the year, providing another reason why this means of regulating the year is never seen in ancient Judaism.

Other logic in the biblical nomenclature has been overlooked that suggests the Hebrews understood the beginning and mid-point of the year. In Exod 23:16 we are told that the Feast of Ingathering is at the “going out of the year” (בִּצְאת הַשָּׁנָה). This answers to the phrase invariably used for the time of the spring feast and for when kings go out to war, the “return of the year,” תְּשׁוּבַת הַשָּׁנָה, that time which brings one back to the head month, Aviv. Thus the nomenclature is not haphazard, but signifies the opposite corners of a festival year ruled by the sun.

Philo’s emphasis on equinoxes and the equinoctial signs that governed the two main festivals of Judaism indicates the latter were never intended to stray more than one sidereal month beyond their respective equinoxes. The Passover should not occur prior to the equinox, as stipulated by Roš Haš. 21a. Fotheringham, based on Philo and many other Jewish sources, confidently concluded: “There can ... be no doubt that the theoretically correct date for Nisan 14 has been within [29 or 30] days of the spring equinox *from a remote antiquity* with perhaps a latitude of a few days on either side of the equinox.”⁷¹ This rule of the equinox appears to have been operative in AD 37. Tiberius Caesar died on March 16, as is known from classical sources.⁷² News of his death reached the governor of Syria, Vitellius, in Jerusalem on the fourth day of Passover that year.⁷³ Since we are certain this news took over a month to reach Jerusalem, the Passover could not have occurred on March 21 that year. Clearly Nisan 14 fell on April 19 in AD 37. As March 21 is only two days before the equinox, the Sanhedrin at this time may have avoided violating the rule of the equinox.⁷⁴

⁶⁹Compare Stern, *Calendar and Community*, 52, 161. Stern notes a prominent rabbi who realized that תְּקִיפַת הַשָּׁנָה could be used to refer to the spring equinox (cf. 2 Chr 24:23).

⁷⁰Richard Parker and Waldo Dubberstein, *Babylonian Chronology, 626 B.C.–A.D. 75* (Providence, RI: Brown University Press, 1956), 27–36.

⁷¹Fotheringham, “The Evidence of Astronomy,” 156 (italics and bracketed insertion mine).

⁷²Tacitus, *Annals* 6.50, 6.51 (Steve Mason, trans. and comm., *Flavius Josephus: Judean War* 2 [Leiden: Brill, 2008], 153).

⁷³Josephus, A.J. 18.5.3.

⁷⁴Stern (*Calendar and Community*, 57) states: “The vernal equinox occurred in this period around 23 March, before which, according to this rule, the celebration of Passover would have been precluded.” Stern cites one questionable instance where the rule of the equinox may not have been followed, based on the 25 Phaophi date on the Bereniki inscription. On pp. 60–61, Stern argues for October 26, 41 BC for the first day of *Sukkot*. This date is five weeks after the equinox. But other scholars cite lack of

The Judean use of rule of the equinox may be seen at the end of the First Temple period. By comparing biblical and Babylonian records for the deportation of Jehoiachin, king of Judah, one may deduce that the Jews' Nisan was one month prior to the Babylonians' Nisanu in 597 BC. *Babylonian Chronicle* (B.M. 21946) gives Addaru 2 of Nebuchadnezzar's seventh year (= March 16, 597 BC) as the exact date for the capture of Jehoiachin. This date is one of the cornerstones of biblical chronology.⁷⁵ Here, I will use it to show how Babylonian and Jewish intercalation differed. Due to the mention of intercalary months in cuneiform texts, the Babylonian calendar can be known "with a high degree of accuracy" during this time period.⁷⁶ It is certain that the Babylonians inserted a second Ululu (sixth month) in 598 BC,⁷⁷ which meant that the last month (Addaru) of Nebuchadnezzar's seventh year *began* on March 15 and ended on April 12, 597 BC. However, the Jews' 12th month (Adar) *ended* with the new moon of March 14, 597 BC; since lunar day 14 of the Jews' Nisan was March 28, and as this date is after the equinox, they had no need to intercalate a second Adar. This means that in Judea, year 8 of Nebuchadnezzar began on Nisan 1 (= March 15, 597 BC), as reflected in 2 Kgs 24:10. However, in Babylon it began a month later, as reflected in *Babylonian Chronicle* 5.11-13, which designates the same event, Jeconiah's deportation on Addaru 2, year 7 of Nebuchadnezzar.⁷⁸ This difference may be understood in terms of Babylon's *Akitu* festival, which began on Nisanu 2, versus Passover, which fell on Nisan 14. The goal of preventing these festivals from falling before the equinox led to a discrepancy between Israelite and Babylonian intercalation about nine times every 19 years.⁷⁹ The reader will note that Israel's intercalary "rule of the equinox" was observed in 597 BC.

A difference between the Jewish and Babylonian calendar, similar to the one shown for 598/597 BC, is capable of explaining the enigmatic reference to Kislev and Nisan lying within Artaxerxes's "20th year" (Neh 1:1; 2:1). Since astronomical tablets show the Persian Nisan began on April 13 or April 14 in the 20th year of both Darius I

evidence for 41 BC (see Stern, *Calendar and Community*, 59-60). Granting this date, the Jews on Cyrenaica, where the text was found, may have followed an idiosyncratic calendar. However, the uncertainty surrounding the year of the Bereniki inscription prevents it from being unequivocal evidence for the normative Jewish attitude toward the rule of the equinox.

⁷⁵Gershon Galil, *The Chronology of the Kings of Israel and Judah* (Leiden: Brill, 1996), 108; Jack Finegan, *The Handbook of Biblical Chronology* (Carol Stream, IL: Tyndale House, 2015), 258.

⁷⁶Finegan, *Handbook of Biblical Chronology*, 27-28.

⁷⁷Parker and Dubberstein, *Babylonian Chronology*, 27. For certainty of Ululu II (Sep 22-Oct 20, 598 BC) see Galil, *Chronology of the Kings*, 114; idem, "The Babylonian Calendar and the Chronology of the Last Kings of Judah," *Bib* 72 (1991): 373.

⁷⁸By positing a simple difference in intercalation, Galil was able to accommodate all the biblical and Babylonian evidence from 609-586 B ("The Babylonian Calendar," 367-78).

⁷⁹Ormond Edwards, *The Time of Christ: A Chronology of the Crucifixion* (Edinburgh: Floris, 1986), 38.

and Artaxerxes I, and both dates are the result of intercalations that are contrary to the Judean practice in 597 BC, it appears that Nisanu 1 in Shushan came one month later than the Jewish Nisan.⁸⁰ The difference between 2 Kgs 24:12 and Neh 2:1 is that in the latter, Nehemiah is in Shushan (Neh 1:1), so that the Persian calendar and regnal reckoning is honored; that is, it is still year 20. Year 21 will not arrive until the Persian *Nisanu*, one month later. In 2 Kgs 24 the vantage point is Jerusalem, where the Jewish Nisan had already brought about year eight of Nebuchadnezzar in 597 BC. Thus, contra *Roš Haš.* 3a and Edwin Thiele, Neh 2:1 is not unequivocal support for Tishri reckoning.⁸¹ Second Kings 24:12 is an important datum point showing the continuity of this rule from the calendrical system in the Pentateuch and down to the one maintained by Jewish authorities in Late Antiquity. While lunar dates for Israel are few during this period, in the absence of evidence to the contrary, it seems safe to assume that empirical practices, in general, remained the same throughout the period of the Second Temple. The reader will note that if the disparity in intercalation seen in these two examples is correct, then the widespread assumption that the Jews in exile acquired their calendar from the Babylonians seems doubtful.⁸²

After the temple was destroyed in AD 70, Stern believes that the ripeness of the **אֶכָּיִב** replaced pilgrimage considerations as the main criterion for setting Nisan 1,⁸³ which sometimes led to observance of the Passover prior to the equinox. Even after the rule of the equinox was adopted around AD 300, many Jewish communities continued to observe Passover based on barley ripening, i.e., prior to the equinox. While the *Didascalia* instructed those keeping Easter in Syria to do so according to when the Jews kept Passover,⁸⁴ other Christians, such as Dionysius of Alexandria (ca. AD 240) adopted the rule of the equinox to calculate the Egyptian church's date for the paschal feast, the high point of the liturgical year.⁸⁵ Moreover, Anatolius (ca. AD 270) reproached Christians who placed the 14th of Nisan in the 12th sign

⁸⁰Parker and Dubberstein, *Babylonian Chronology*, 30, 32. I mention both of these Persian monarchs because it is not a foregone conclusion that the Artaxerxes of Ezra 7:1ff. and Neh 2:1 must be some king after Darius the Great (522–486 BC). The author of the *Seder Olam* identifies Darius I with Artaxerxes, the case for which is much stronger than modern scholars suppose. See Heinrich W. Huggenberger, trans. and comm., *Seder Olam: The Rabbinic View of Biblical Chronology* (New York: Aaronson, 1998), 247–52.

⁸¹Edwin Thiele, *The Mysterious Numbers of the Hebrew Kings*, 3rd ed. (Grand Rapids: Kregel, 1983), 53. Thiele, knowing that the Persians used Nisan reckoning for regnal years, supposes that Nehemiah, in a spate of “intense nationalism, applied the customary Jewish practice [which he supposes to be Tishri reckoning], even to a Persian king” (p. 53, my insertion). This is highly unlikely. Rabbinic scholars (*Roš Haš.* 3a) were also misled by Neh 1:1 and 2:1. However, Hag 1:15 and 2:1 prove conclusively that Darius did not use Tishri reckoning (cf. *Roš Haš.* 3b).

⁸²Contra Stern, *Calendars in Antiquity*, 332.

⁸³Stern, *Calendar and Community*, 70–71, cites T. Sanhedrin. 2:2; B. Sanhedrin 11b.

⁸⁴Stern, *Calendar and Community*, 68.

⁸⁵Eusebius, *Eccl. Hist.* 7:20, 32.

of the zodiac instead of the first.⁸⁶ The Canon of Anatolius (ca. AD 270) lists several pre-Philonic Jewish authorities for the “rule of the equinox.”⁸⁷ It states:

When these (writers) explain questions concerning the Exodus, they say that it is necessary that all alike sacrifice the Passover after the vernal equinox, in the middle of the first month; and this occurs when the sun passes through the first sector of the solar ... zodiacal cycle ... [at Passover] the sun will be in the sector of the vernal equinox and ... the moon, of necessity will be in (the sector of) the autumnal (equinox).⁸⁸

This description sounds very much like the passages in Philo and Josephus that link the equinox with the major feasts and with Aries and Libra. In this pre-Nicaean period, Anatolius’s invoking of the authority of various Jewish sages may be seen as an effort to ground the church’s most important observance in a law-based understanding of the timing of Passover.⁸⁹ Christian theologians in this early period, even as late as Augustine, generally saw orthodox Judaism as the heirs of the religion of Moses. Christians in the East tended to default to Jewish dates, while others studied to uncover the authoritative roots of the Passover timing in terms of the rule of the equinox. This can be seen in Eusebius’s indictment of the Jews’ Nisan 15 Passover (as seen John 18:28), because it was contrary to the Law of Moses. There seems to be little reason to doubt the legitimacy of Anatolius’s attribution of the rule of the equinox to various Jewish authorities prior to Philo, including Aristobulus, the teacher of

⁸⁶Anatolius, *Canons on the Passover*, cited by Eusebius, *Eccl. Hist.* 7.32.15–16; Stern, *Calendar and Community*, 66.

⁸⁷Cited by Eusebius, *Eccl. Hist.* 7:32.16–17, 19. Anatolius refers to Aristobulus, the teacher of Ptolemy Philometer VI (185–145 BC; 2 Macc. 1:10), Mysaeus, the two Agathobuli, and the book of Enoch. Regarding the latter, J. van Goudoever (*Biblical Calendars*, 2nd ed. [Leiden: Brill, 1961], 9) states that Anatolius was right to point out that the book of Enoch proves the Jews were already fixing the first month of the year near the spring equinox two centuries before the present era. However, Stern (*Calendar and Community*, 52) believes Anatolius’s citation of Aristobulus is “the earliest attestation of ... the rule of the equinox”—that Passover may not fall prior to the equinox.

⁸⁸Anatolius, cited by Eusebius, *Eccl. Hist.* 7:32.17–18.

⁸⁹For a different opinion, see Stern, *Calendar and Community*, 83. By the third century, however, many Jewish communities were observing Passover prior to the equinox (ibid, 66–71, 74, 78), while others continued to abide by the rule of the equinox. Since unity could not be achieved by following the Jews, Constantine exerted a strong hand at the Council of Nicaea to bring about a unified orthodoxy on the matter of Easter.

Ptolemy Philadelphus (ca. 160 BC).⁹⁰ Aristobulus understood that the new moon of Aviv in Exod 12:2 was regulated by the spring equinox.⁹¹

The criticism of Christian authorities, including Constantine, against Jewish observance of Passover before the equinox (or divergent observances before and after) may have led to Hillel II's reform only ten to twenty years after Constantine's death. It precalculated the first day of the months, *ad infinitum* into the future, based on the lunar conjunction (*molad*), and fixed the seven years in which a thirteenth month would be intercalated during every 19-year Metonic cycle. Hillel's calendar kept track of the mean equinox and purposely placed Nisan 15 on or after it.⁹² The introduction of this fixed calendar came about at a time when there was intense fervor over the timing of Easter among Christian theologians. Stern discusses the possibility, and indeed the likelihood, that Christian polemic against month-early observance of Easters and Passovers may have led to Jewish adoption of a fixed calendar and abandonment of pre-equinox Passovers.⁹³ However, many local Jewish synagogues continued to honor the traditional empirical methods described in the Mishnah, since, as Stern puts it, "it was based on regular observations of the moon and hence did not suffer ... from the ... discrepancies from astronomical reality which calculated calendars always, unavoidably, entail."⁹⁴ An astronomer's description of those discrepancies provides a broader perspective:

The Metonic Cycle is very good, [but] it is not perfect.... It is a little off if you use it to predict the length of the tropical year.... Over the centuries the date of the vernal equinox, as predicted by the Metonic Cycle, has been drifting to later and later dates. So, the rule for Passover, which was originally intended to track the vernal equinox, has gotten a few days off. In ancient times this was never a problem since Passover was set by actual observations of the Moon and of the vernal equinox. However, after Hillel II standardized the Hebrew calendar in the 4th century, actual observations of celestial events no longer played a part in the determination of the date of Passover.⁹⁵

⁹⁰Anatolius, cited by Eusebius, *Eccl. Hist.* 7.32.15–16. Stern, however, believes intercalations based solely on the rule of the equinox were first given by the Amoraim (b. Roš. Haš. 21a; Stern, *Calendar and Community*, 167), between AD 200 and 500. For Stern's doubts about Anatolius's citation of Jewish sages, see *Calendar and Community*, 51, *passim*.

⁹¹Anatolius's *Canons on the Passover*, cited by Eusebius, *Eccl. Hist.* 7.32.15–16.

⁹²It does not apparently track the true astronomical equinox (Stern, *Calendar and Community*, 199).

⁹³Stern, *Calendar and Community*, 141–43, 224–25.

⁹⁴*Ibid.*, 229.

⁹⁵Bill Jefferys, Professor Emeritus in Astronomy at the University of Texas at Austin, <http://quasar.as.utexas.edu/BillInfo/ReligiousCalendars.html>.

IV. WHEN DOES THE HEBREW DAY BEGIN?

A day begins with evening (ערב) throughout Scripture [e.g., Gen 1:5, 8, 13, 19, 23, 31; Lev 23:32; Neh 13:19; Mark 1:32; and Acts 27:27, 33]). The word מִערֶב signifies west, “the place of sunset.”⁹⁶ The fast of the Day of Atonement (Lev 23:32) is kept “on the ninth day of the month at sunset (בְּעֶרֶב),”⁹⁷ from the evening [of the ninth day] until the evening (מִעֶרֶב עַד-עֶרֶב) of the tenth day.”⁹⁸ Below we will see the ל preposition (toward, as in לְעֶרֶב) is used to indicate time just prior to sunset “toward sunset.” This shows that one day ends and another begins at sundown (בְּעֶרֶב). Exodus 12:18 uses בְּעֶרֶב the same way as Lev 23:32: “In the first month, you are to eat unleavened bread, from the 14th day of the month at sunset (בְּעֶרֶב) until the 21st day of the month at sunset (בְּעֶרֶב).” An exhaustive treatment of all 35 occurrences of בְּעֶרֶב (Masoretic Text) is unnecessary, since they all fit the end of a day.⁹⁹

Exodus 16 helps clarify the use of these critical terms. In Exod 16:12b, 14–15, manna came on the first day of the week. This requires the datum point at the beginning of the chapter (Exod 16:1) to be a Saturday.¹⁰⁰ As with Exod 12:18 and Lev 23:32, בְּעֶרֶב in Exod 16:13 is at day’s end: “It came to pass at sunset [בְּעֶרֶב] the quail came up and covered the camp.” The quail are sent at בְּעֶרֶב/sundown, so that they may now gather, prepare, and cook the quail during twilight: “You shall eat the meat at twilight” (בֵּין הָעֶרְבִים), lit. “between the two evenings”).¹⁰¹ Thus the entire passage clearly portrays בְּעֶרֶב/sunset as marking a break between sacred time (Saturday afternoon) and that which followed sunset. Since sending the quail at sunset was didactic – teaching the Israelites to avoid the work of cooking food on

⁹⁶Ronald B. Allen, “מִערֶב (ma’ārāb),” TWOT 694.

⁹⁷The preposition *ba*, “at, in, or on,” makes the time specific to sundown.

⁹⁸The use of the preposition *ad*- again indicates “as far as” and no further. In other words, up until the onset of evening on Tishri 10. It also shows that evening (*ereb*) belongs to the beginning of a day. The LXX translates *ereb* as *hespera*, a Greek word for evening.

⁹⁹Gen 19:1; 29:23; 30:16; Lev 6:13; Num 19:19; Judg 19:16; 2 Sam 11:13; 1 Kgs 17:6; 22:35.

¹⁰⁰This is also the view in the Seder Olam (Huggenberger, *Seder Olam*, 67–68). Regarding the seven-day weekly cycle, Stern (*Calendar and Community*, 107) states: “This is not always possible to prove.... But in the absence of evidence to the contrary, it is likely that the week was always reckoned by the Jews in the same way, from the earliest period until the present day. Indeed, we do not find any reference in any ancient source, whether Jewish, Christian, or other, to any dispute or division about the reckoning of Sabbath and the days of the week. The week appears to have transcended, quite remarkably, calendrical sectarianism and/or diversity.”

¹⁰¹Francis Brown, S. R. Driver, Charles A. Briggs, *The New Brown, Driver, Briggs Gesenius Hebrew and English Lexicon* (Peabody, MA: Hendrickson, 1979), 88a. The phrase בֵּין הָעֶרְבִים occurs 11 times, only in the Pentateuch. Five specify the time of day for offering the paschal lamb, four the time of the evening sacrifice (Exod 29:39, 41; Num 28:4, 8). In Exod 30:8 it is used of the time for the lighting of the candles in the tabernacle, in other words, twilight. Nearly all translations (including JPS) render בֵּין הָעֶרְבִים as dusk or twilight.

the Sabbath (Exod 16:23) – this explains the specificity of the language in Exod 16:12–13.

Judges 19:9 uses the Hebrew idiom **רָפָה הַיּוֹם לָעֶרֶב** to express the fact that “the day has waned toward evening.”¹⁰² The vast majority of translations understand the **ל** preposition as indicating “toward sunset,” but not *at* sunset. The NET has, “See how the day wears on toward sunset.” The use of the **ל** preposition here is analogous to the circumstance in Gen 24:11, where **לֵעֵת עֶרֶב לֵעֵת צֵאת הַשְּׁאֵבֶת** may be translated, “toward the time of sunset, at the time of going out to draw water.”¹⁰³ Hence if **לָעֶרֶב** and **לֵעֵת עֶרֶב** are the period just prior to sunset, then **בְּעֶרֶב** can be nothing other than sunset itself.

In 2 Sam 3:35, David regards the end of the day as sunset and evening (*ereb*) as subsequent to sunset. When the people tried to make David eat bread while it was still daytime, he swore an imprecatory oath (2 Sam 3:35): “May God curse me ... if I taste bread or anything *before the sun goes down*” (**לִפְנֵי בּוֹא הַשֶּׁמֶשׁ**). Earlier, when the death of Saul and his sons is reported to David and his men, they mourned, wept, and fasted “until evening” (**עַד-עֶרֶב**, 2 Sam 1:12). In Josh 8:29 the phrase **וַיִּכְבּוּא הַשֶּׁמֶשׁ** is synonymous with the onset of evening at sunset: “[Joshua] hanged the king of Ai on the tree *until the time of evening* [**הָעֶרֶב עַד-עֵת**], and *when the sun went down* [**וַיִּכְבּוּא הַשֶּׁמֶשׁ**], Joshua commanded, and took the body down.”¹⁰⁴ A millennium and a half later, the sun’s entry into the horizon still marked the end of the Jewish day (in this case a Sabbath): “And *when evening had come* (Ὁψίας δὲ γενομένης), after the sun had set, they began bringing to him all who were ill” (Mark 1:32).

V. THE SLAYING OF THE PASCHAL LAMB: EVE OF THE 14TH VERSUS MID-AFTERNOON OF NISAN 14

Since the paschal lamb was also killed “at twilight” (Exod 12:6, cf. Exod 16:12), and since sunset precedes twilight, this indicates the original Passover was at the start of Aviv 14, not at the end of the day. Grace Amadon correctly states that “the OT fully sets forth 14 Nisan as the original Passover date, upon which the lamb was sacrificed and eaten.”¹⁰⁵ The language of the Mosaic Passover (Exod 12:6) is unambiguous: “Your lamb shall be an unblemished male a year old.... You shall keep it *until* the fourteenth day of the same month, then the whole assembly of the congregation of Israel is to kill it *at twilight*”

¹⁰²William White, “**רָפָה** (*rāpā*),” *TWOT* 858–59, defines **רָפָה** as “to sink down, let drop, be disheartened.”

¹⁰³The KJV, ESV, NIV, JPS, Green’s Interlinear, and the NEB translate **לָעֶרֶב** as “toward evening.”

¹⁰⁴While Joshua appears to have the Mosaic statute in Deut 21:23 in mind – where those executed upon a tree are to be buried “in that same day” (**בַּיּוֹם הַהוּא**) – it is unclear that this statute applied to enemy combatants in wartime.

¹⁰⁵Amadon, “Ancient Jewish Calendation,” 230.

(בֵּין הָעֶרְבִים, Exod 12:5–6, NASB, my emphasis).¹⁰⁶ The Hebrew preposition “until” (עַד) means *as far as* and would be a poor choice of words if the intent were to keep the lamb through Nisan 14. When the writer of Exodus wishes to reference the evening at the end of Nisan 14, as in Exod 12:18, he uses בְּעֶרֶב/sunset—עַד is not used except to express the *terminus ad quem* for eating מִצֵּת/unleavened bread on Nisan 21.¹⁰⁷ Virtually all translations correctly render עַד of Exod 12:6 “until.”¹⁰⁸ The NIV has, “Take care of them *until* the fourteenth day of the month, when all ... Israel must slaughter them *at twilight*” (cf. “at twilight” in ESV; NAS; NKJV; JPS).¹⁰⁹ Note the Hebrew expression עַד-אֵינָהּ to denote “until when” in Exod 16:28, “Until when [up to what point] do you refuse to obey my commandments?”

Based on the preponderance of linguistic evidence, is it any wonder the Sadducees, Samaritans, and Karaites all believed the paschal lamb was to be slaughtered between the hours of 6 and 7 o’clock in the evening?¹¹⁰ The Pharisees, however, believed the lambs were to be slaughtered during the afternoon.¹¹¹ Such a redefinition of *ereb* fails to give weight to expressions such as “wolves of the evening” (זְאֵבֵי עֶרֶב, Hab 1:8; Zeph 3:3), which do not howl in the afternoon. Aaron did not light the menorah in the tabernacle in mid-afternoon (Exod 30:8), but at בֵּין הָעֶרְבִים, “between sunset and dark.” The same phrase defines the time of both the evening sacrifice (Exod 29:38, 41; Num 28:4, 8) and the Passover lambs of Exod 12:6, which nearly all versions correctly render “twilight,” “dusk,” or “evening.”

Later temple-centered practices are at variance with this understanding. The rabbis, seeking to justify or explain afternoon performance of sacrifices originally designated for twilight (e.g., the Passover and the daily evening sacrifice), were perhaps faced with the choice of either ignoring or redefining the temporal implications of the Hebrew in Exod 16:12–13. Instead of defining בֵּין הָעֶרְבִים, the rabbis invented a phrase, בֵּין הַשְּׁמֶשׁוֹת/bên hašemešôt¹¹² (b. Ber. 2b; b.

¹⁰⁶D. Stern, *CJB*, translates *bên hā’arbāyīm* as “dusk” in Exod 12:6; at Lev 23:5 it is translated “between sundown and complete darkness.”

¹⁰⁷Other passages where בְּעֶרֶב is the term of choice for the end, rather than the beginning, of Nisan 14 include Deut 16:4, 6, and Josh 5:10. Both reference the commanded commemoration of the Nisan 15 exodus to be carried out only after they entered the land (Exod 13:3–5; Deut 16:1, 6). The regulations of Deut 16 are seen here as application only to the holy offerings of the pilgrimage feast, not to the Pesah victim of Nisan 14. Compare J. B. Segal, *The Hebrew Passover: From the Earliest Times to A.D. 70* (London: Oxford University Press, 1963), 16.

¹⁰⁸KJV, JPS, NASB, ESV, NEB, CJB, YLT.

¹⁰⁹NET has “around sundown,” and the RSV follows the KJV “in the evening.”

¹¹⁰van Goudoever, *Biblical Calendars*, 9. Sunset in late March and early April occurred at 6 p.m., give or take ten minutes, consistent with the biblical definition of *bên hā’arbāyīm*.

¹¹¹The Pharisaic practice may have originated as early as the eighth century BC, as discussed below in section A, “The Passovers of Hezekiah and Josiah.”

¹¹²*Bên hašemešôt* (lit. “between the wests or between the suns”) is not found in the Hebrew Bible, where *šemeš* always occurs in the singular and is never preceded with *bên* (בֵּין = “between”).

Abot 5:9), which does not occur in the Pentateuch. While many rabbis used both phrases to refer to the transition period between day and night, *בֵּין הַשְּׁמֶשׁוֹת* signified “between the suns,” that is, the period between high noon and dark—from the time the sun leaves the eastern part of the sky and sinks toward the west. This phrase would have suited well the six or seven hours required to slaughter tens of thousands of paschal lambs along with the evening sacrifice (Exod 29:39; Num 28:4b). Had the temporal limits of *בֵּין הָעֶרְבִים* sufficed, it is doubtful the new expression would have come into use. However, it is unlikely any phrase with *עֶרֶב* could have meant the afternoon, due to its long-standing association with the sun’s entry below the horizon¹¹³ and with the mixture of sunlight and darkness we call dusk.¹¹⁴ It was that time of day when sunset forced laborers to go home: “Man goes out to work and labors *until evening* (*עַד-עֶרֶב*) falls” (Ps 104:23).

VI. SEPARATING PASSOVER AND THE FIRST DAY OF UNLEAVENED BREAD

Many biblical passages besides Exod 12:6 place Passover on the 14th day of the first month (Lev 23:5; Num 28:16–17; Josh 5:10; 2 Chr 30:15; 35:1; Ezek 6:19). While Nisan 14 is the first of the annual *môadîm*, it is not an annual Sabbath. Nisan 14 answers to the passing over of the Death Angel in Egypt (Exod 12:23). The Passover of Exod 12 was eaten on the evening portion of the 14th, at the end of Nisan 13. Philo and Josephus placed the Feast of Unleavened Bread (Nisan 15–21) after the Passover.¹¹⁵ Nisan 15 is the first day of Unleavened Bread, ordained because of the kind of bread the Israelites took with them on that day when they went out of Egypt (Exod 12:15, 17, 34). Due to its historical import, it became the first holy convocation in Israel’s liturgical calendar year (Exod 12:16; Lev 23:7). The first day of this seven-day feast is explicitly said to be the morrow *after* the Passover (Num 33:3).

¹¹³The Assyrian *erêbu*, a cognate of the Hebrew verb *‘āreb/evening*, meant “to enter” or “go under” (the earth), “the sun and other heavenly bodies were said to ‘go in’ under the earth,” no different than the Hebrew *bô’ haššemeš*, the entering of the sun (Charles C. Torrey, “Studies in the Aramaic of the First Century,” ZAW 65 [1953]: 240). Similar expressions were used in other cultures throughout the Fertile Crescent—Akkadian, Sumerian, Ugaritic, Assyrian, Aramaic, etc. Everywhere *‘ārab* and its cognates meant “the going down and the going in” (HALOT 2.877).

¹¹⁴The homonym of *‘ereb*, *gam-‘ēreb*, is used in Exod 12:38 for the non-Israelite “mixed multitude of people” that followed Israel out of Egypt.

¹¹⁵Philo, *Spec. Laws* 2.150; Josephus, A.J. 9.271.

It is precarious to retroject customary nomenclature of later Judaism, including the Gospel accounts, back onto the Mosaic legislation found in the biblical text. Josephus mentions several times that the Jews of his day “were celebrating the feast of unleavened bread, which we call Passover.” Josephus in some places ascribes eight days to this feast,¹¹⁶ from which it is clear he has adjoined Nisan 14 (Passover day) with the Feast of Unleavened Bread.¹¹⁷ Conflation of the two occurred no later than the time of Ezekiel (Ezek 45:21).

Modern Judaism believes the Exodus out of Egypt was concurrent with the death of the firstborn and the eating of Pesah. The Israelites were strictly commanded: “None of you shall go outside the door of his house until morning (Exod 12:22).” The light of dawn of Nisan 14 was the ideal universal signal to large numbers of Israelite families in the region of Goshen that it was now safe to leave their homes and begin the business of getting out of Egypt – the implication being that Israel rested that night oblivious to the Death Angel. Some have supposed that since Pharaoh summoned Moses by night, Israel went out on the same night. “And he called for Moses and Aaron by night, and said, ‘Arise up, get out from among my people, both you and the children of Israel; and go, serve Yahweh, as you have said’” (Exod 12:31). But Pharaoh’s visit to Moses and Aaron had no bearing on the earlier prohibition against the average Israelite leaving his house prior to daybreak.

Not only did the Israelites not leave Egypt on Passover night, but it is also unlikely they left before evening of the next day. Deuteronomy 16:1 says they went out of Egypt “by night,” on Nisan 15, the day after Passover (Num 33:3). At least two requirements weigh heavily against the notion that the Israelites left Egypt the same night as the Death Angel. The first involves the time it took for Israel to pack the silver, gold, and articles of clothing the Egyptians gave them (Exod 12:35; Ps 105:37), which had been precipitated by the death of the firstborn. The second is logistical: Moses marshalled Israel “in battle array” (groups of five) at Rameses (Num 33:1–2).¹¹⁸ Common sense dictates that we not ignore the time required to execute this staging for the exodus. Therefore, the night departure of Deut 16:1 was subsequent to the night of the Passover meal.

¹¹⁶Josephus, A.J. 2.317.

¹¹⁷However, in other places, the “other sacrifices” of the seven days of Unleavened Bread are correctly said to come *after* the Passover sacrifice of Nisan 14. See Josephus, A.J. 9.271 and 11.110.

¹¹⁸Victor P. Hamilton, “חֲמִשָּׁה,” TWOT 299. Also, the use of the term *ṣebā’ôt* in Exod 12:41 (John E. Hartley, “צְבָאוֹת,” TWOT 750–51) – “all the hosts of Yahweh went out from the land of Egypt” – implies military formation.

A. The Passovers of Hezekiah and Josiah

Historical circumstances conspired to transfer the paschal meal from the night of Nisan 14 to the following night, that of Nisan 15, as reflected in modern Judaism. During the Judges and monarchical periods, Passover was neglected (2 Kgs 23:22). In 726 BC, however, Hezekiah restored the temple and invited all Israel to a centralized Passover celebration in Jerusalem. Large numbers of respondents came from various northern tribal entities who had not kept a Passover in many generations (2 Chr 30:1, 10). For this reason, Hezekiah restricted the slaughtering of the Passover lambs to the priesthood (2 Chr 30:12, 15–17). It is a reasonable hypothesis that this confinement of paschal sacrifices to the temple necessitated—due to the sheer number of victims—a change of time from dusk of Nisan 14 to the following afternoon of Nisan 14. Note that when 2 Chr 30:15 states: “They slaughtered the paschal sacrifice on the fourteenth day of the second month,” the usual accompanying phrase, *bên hā’arbāyīm* (dusk), is missing (cf. Exod 12:6; Lev 23:5; Num 9:11). The Passover account of Josiah (2 Chr 35:1) also omits this critical time phrase. So long as Passover remained an individual household event, as it was under Moses and later, the period of dusk sufficed for carrying out the slaughtering of lambs. By contrast, the killing of thousands of paschal lambs at the Temple during Hezekiah and Josiah’s revivals required a transfer of the time of slaughter to the day portion of Nisan 14. This practice continued during the Second Temple Period. In 4 BC, Josephus (*J.W.* 6.424) speaks of 255,600 lambs being sacrificed at the Temple during Passover.¹¹⁹

B. Passover Observance in the First Century

Though Passover observance and the day itself went through changes, evidence of a Mosaic Passover may be found in the Gospels and in Talmudic literature. We must consider the possibility that two different customs regarding the timing of Passover existed side-by-side in first century Judea. After having eaten the Passover with his disciples (Matt 26:17–19; Mark 14:12–15; Luke 22:7–16) on the eve of Nisan 14, Christ was arrested. However, the following dawn the Jewish Sanhedrin, after leading Christ to Pilate’s palace, did not enter, so that they might eat the Passover on the next evening, the eve of Nisan 15 (John 18:28). When Eusebius of Caesarea comments on this verse, he accuses the Jewish leaders of violating the Law of Moses, stating that they ought to have eaten the Passover on Nisan 14 instead of Nisan 15.¹²⁰ The grammatical evidence adduced below for Mark

¹¹⁹Joachim Jeremias (*Jerusalem in the Time of Jesus* [Philadelphia: Fortress, 1969], 57) considers this number an exaggeration, but see Josephus (*Ant.* XVII.1.3). It comports with the 2.5 million visitors during Passover in 4 BC.

¹²⁰Georges Declercq (*Anno Domini: The Origins of the Christian Era* [Turnhout: Brepols, 2000], 16) cites Eusebius’s *On the Celebration of the Pascha*.

14:12 and Luke 22:7 strongly supports Eusebius's contention. Further evidence confirms that a Nisan 15 Jewish Passover was eaten only a few hours after Yeshua of Nazareth died – b. Sanh. 43a of the Munich manuscript of the Talmud states that the trial and hanging of "Yeshu Notzri" took place "on the Eve of Passover," i.e., the afternoon of Nisan 14.¹²¹ Zebahim 1:3 supports these Synoptic passages. R. Joshua said that the heads of some households brought their Passover victims to the temple to be slaughtered "in the morning of the fourteenth, but not under its proper name." He declared this "valid, as if it were slaughtered on the thirteenth."¹²² Implicit in R. Joshua's statement is the validity of paschal lambs slaughtered on Nisan 13. Casey states the *Sitz im Leben* of this judgment "makes excellent sense at the end of the Second Temple period, when Jerusalem was packed with pilgrims," at a time when "everyone knew that many victims were sacrificed on the 13th Nisan, and that this was accepted practice."¹²³ This interpretation is strengthened if, as I have shown, paschal lambs were originally slain and eaten on the eve of the 14th, not mid-afternoon of the 14th.

Mark 14:12 says that "on the first of the unleaveneds, when they were [already] sacrificing [ἐθνον], his disciples said to him, 'Where do you want us to go to prepare in order that you may eat the Passover lamb?'"¹²⁴ Since this likely took place in the early afternoon of Nisan 13 – Christ having been crucified on Nisan 14 – Mark 14:12 is a clear indication that, for many, observance of the Passover took place on the eve of Nisan 14, just as it had on the first Mosaic Passover (Exod 12:6). With more than a dozen references in the Synoptic Gospels to Christ and his disciples eating τὸ πάσχα (*the Passover lamb*) the night before he was crucified, the suggestion that Christ's Last Supper was an untimely Passover is unwarranted.¹²⁵

¹²¹David Instone-Brewer, "Jesus of Nazareth's Trial in the Uncensored Talmud," *TynBul* 62 (2011): 269–94. He states, "The least difficult explanation is that the earliest core of the censored tradition of Jesus' trial came from the time of Jesus. Succeeding generations felt they could not change it, despite difficulties presented by the wording." B.Sanh. 67a also has "on the eve of Passover they hung Ben Stada or Ben Pandira," other Talmudic pseudonyms for Yeshua of Nazareth.

¹²²Maurice Casey, "The Date of the Passover Sacrifices and Mark 14:12," *TB* 48 (1997): 245.

¹²³*Ibid.*

¹²⁴If we take the imperfect active indicative ἐθνον as inceptive (Daniel Wallace, *Greek Grammar Beyond the Basics* [Grand Rapids, 1996], 544–45), then Mark 14:12 is telling us that Jewish families had begun killing or were on the verge of killing the Passover lambs at the time when his disciples asked him this question. This cannot be construed as the late 14th, since the next day is still called the παρασκευή, "preparation day" (Mark 15:42; Luke 23:54; John 19:31, 42) – a day which precedes Sabbaths or annual feast days – in this case the day preceding Nisan 15. When Judas departed early from the Last Supper, the other disciples thought he was going to purchase items for the feast (John 13:29). It is doubtful they would have thought this on the eve of Nisan 15, when businesses were closed.

¹²⁵The following twelve Gospel verses indicate the Last Supper/Passover (τὸ πάσχα) occurred on the evening which began at sunset, at the end of 13 Nisan: Matt 26:2, 17, 18, 19; Mark 14:12 (2x), 14, 16; Luke 22:7, 11, 13, 15.

Luke goes out of his way to punctuate the lawfulness of Christ's paschal meal. The grammar of Luke 22:7 tells us that Peter and John "made ready the Passover lamb" (Luke 22:8, 11, 13) at the very time "when the paschal lamb *must* be sacrificed" (as per Luke 22:7-8, ἔδει θύεσθαι τὸ πάσχα).¹²⁶ The use of the imperfect form of δεῖ may be understood as ingressive or inceptive, stressing the beginning of the time—"the day of the unleaveneds"—when the paschal lamb *must* or *should* be sacrificed due to lawful requirement.¹²⁷ Thus it appears that Christ and his disciples adhered to the original Mosaic timing of the Passover.¹²⁸ Luke's choice of words here is deliberate: the lawful time for the procurement and slaughter of paschal lambs had arrived on Nisan 13, so that it could be eaten after sundown.

Presumably, many other households in Jerusalem also ate the Passover on the eve of Nisan 14. Philo tell us that, on Passover night, "each house is ... invested with the character and dignity of a temple, the victim being sacrificed so as to make a suitable feast for the man who has provided it."¹²⁹ Not only does this hearken back to the Mosaic institution in the book of Exodus, but suggests that Jewish communities in Alexandria, where Philo lived, and elsewhere, understood that a Passover meal could be eaten without having to travel to Jerusalem. That this was the apostle Paul's understanding is implicit in his Passover/Lord's Supper instruction to the church members in Achaia (1 Cor 5:6-8; 11:23-26; cf. Acts 20:6). It contrasts with the temple-centered practice, wherein a paschal lamb was eaten one night later (cf. John 18:28). All of this comports with the diverse milieu of first century Judaism and should not surprise us.

VII. CONCLUSION

The observational aspects of the Israelite calendar—the sighting of the evening crescent, the setting of the sun for the start of the day, and the rule of the equinox for determining intercalation—all remained normative for most Jews until the Middle Ages. Since the ancient Israelites employed criteria for the start of the day and month that were eventually abandoned by Judaism, it is imperative that scholars avoid application of later extrabiblical rabbinic criteria if they hope to use the ancient positions of the sun and moon as primary witnesses to historical chronology.

¹²⁶Walter Bauer et al., *A Greek-English Lexicon of the New Testament and Other Early Christian Literature* (Chicago: University of Chicago Press, 1979), 172.

¹²⁷Louw and Nida, *Greek-English Lexicon of the New Testament*, 670-72.

¹²⁸Philo (*Moses* 2.224) comments on the uniqueness of the "pascha" sacrifice, when "private individuals brought victims to the altar" and "the whole nation ... officiates in offering sacrifice" (Yonge, *The Works of Philo*, 511).

¹²⁹Philo, *Spec. Laws* 2.148.

An underestimation of the ancients' ability to use the moon and sun as authoritative markers of time has accompanied a general perception that the Bible is less than definitive concerning Israel's calendar. Scholars accustomed to the complexities and obscure evolution of the rabbinic fixed calendar after AD 350 often fail to appreciate the simplicity, sufficiency, and durability of empirical calendar traditions as framed by Gen 1:14–16; Exod 12:2; 23:16; 34:22; Deut 16:1; Jer 31:35; Ps 104:19. It is safe to assume that nearly every ethnic group in the ancient Near East used new moon sightings and equinox determinations to govern their calendars. Even the Egyptians, once thought to be exceptional in this regard, now appear to have relied on the first evening crescent to solemnize a wide variety of important royal and cultic events.¹³⁰ With respect to intercalation, Hillel II incorporated the rule of the equinox into a proposed fixed calendar in the fourth century AD, whereby Nisan 15 was seldom more than 29 days beyond the spring equinox.¹³¹ That it took so many centuries for Hillel II's fixed calendar to displace ancient observational traditions shows the great stability and momentum of light-based calendar conventions. Thus, one empirical lunisolar system of calendation apparently continued from the time of Moses down to the destruction of Solomon's temple in 586 BC. Due to the authority of Moses, whatever tradition existed prior to the exile would have been re-established under Ezra in the postexilic period (Ezra 7:25), then continued throughout the Second Temple period, and subsequently retained by many independent Jewish communities for the better part of the first millennium.

Clarification of ancient Israel's empirical lunisolar calendar affords an opportunity for chronologers who are interested in authenticating biblical timelines and historical data. Groundbreaking research in the field of ancient Egyptian dynastic chronology and the accessibility of accurate first crescent visibility tables is leading to greater certainty assigning Julian date-equivalents to civil-dated Egyptian lunar and Sothic dates.¹³² Conclusions reached in these kinds of Egyptological studies are, according to Segal, "of no little significance for an analysis of methods of calendar-making among the Hebrews" and time-reckoning in general.¹³³ There is no reason the same methodology cannot, with caution, be applied to the chronohistorical data of the Bible. The fixing of dates in history may tell us a great deal. Absolute dating of events has the potential to confirm, for instance, the various phenomena that governed the calendar as well as resolve historical conundrums. In addition, I believe confirmation

¹³⁰Derstine, "The Start of the Egyptian Lunar Month"; idem, "Early Eighteenth Dynasty Chronology." This does not change the fact that Egypt's 365-day civil calendar was the predominate time-keeping device. Indeed, this calendar provided the dates for the lunar-based events.

¹³¹Fotheringham, "The Evidence of Astronomy," 156.

¹³²Derstine, "The Start of the Egyptian Lunar Month"; Derstine cites Gautschy, "Last and First Sightings."

¹³³Segal, "Intercalation and the Hebrew Calendar," 250–51.

of ancient calendar data has a role to play in the debate over theories of late authorship and redaction of the Mosaic corpus and the book of Joshua, possibly shedding new light on the contemporaneity of source material. Thus the largely overlooked possibility of datable biblical astrocalendrical data beckons as an area for future research.