Please return to Grace Amadon

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A.1

THE FLOOD CALENDAR
(Calculation of Moses)

Noah enters ark in Full Moon

YEAR 600 LUNAR YEAR (a)		SOLAR YEAR (b)		PERIODS (40+150) days + 25 weeks (c)	
(1) Tishri	Rosh Hashana	30			
(2) Hesvan		29 { 16, 13	(17th) Rain	40 days rain	
(3) Kisleu		30 { 27, 3	"But upon the eighth day, dark clouds overspread the heavens... Soon large drops of rain began to fall."		
(4) Tebet	Perihelion=Jan.3	29			I
(5) Shebat	Winter	30		150 days = 5 lunar months + 3 days (28 Kisleu – 29 Iyar inclusive)	
(6) Adar		29			
(7) Nisan	Solar tide decreasing	16			
		30 { 1, 13	(17th) Ark rests		
			Moon approaching third quarter, apogee, equator and neap tide		
(8) Iyar		29		190th day = 27 weeks + 1 day	
(9) Sivan		30		30 days	10 weeks Spring tide low
(10) Tammuz	Summer Aphelion = July 4	29 { 1, 28	Tops of mountains seen	40 days	
(11) Ab		30 { 10, 1	(11th) Raven	40th day	II
	Solar tide increasing	19	(18th) Dove 1 (25th) Dove 2	7th day 7th "	4 weeks ending on 8th Elul
(12) Elul		29 { 1, 1	(2nd) Dove 3	7th "	
354 Days		27			
(1) Tishri	Rosh Hashana (Civil New Year)	30 { 1, 29	601st year	21 days = 3 weeks (9 Elul – 29 Elul inc.)	
(2) Hesvan		27	Noah leaves ark in seed-time and 175th day of II	56 " = 8 weeks (1 Tishri – 26 Hesvan inc.) New Moon	
		365 Days		365 Days	

G. Amadon
Mar. 28, 1943

THE FLOOD CHRONICLE

The flood year, as depicted in the book of Genesis, is represented by a definitely outlined calendar. This is constructed in two kinds of time--solar and lunar--and it also conforms to known positions of both sun and moon. With modern scholarship uncertainty still enters into the problem of tying the flood to a recognized chronological outline. But with reference to the flood calendar itself, it can be shown, that although different conclusions have repeatedly been drawn, yet on the contrary it would appear that we have in Genesis seven and eight the simplest form of lunar calendar, and one upon which the solar year also is planted.

Questions relating to the authorship of the book of Genesis are partly answered in the book itself. The fact that the months are numbered and not designated by name--not even the ancient Canaanite names of the month appear in the text--speaks for an early writer. Furthermore, it can be demonstrated that in the flood record the lunar numbers begin in the autumn with the month later denominated "seventh" in biblical history. Philo, Josephus, and the Talmud each supports this conclusion. And additional proof that the flood year began in the autumn is forthcoming from instances in Genesis that relate the year to agricultural operations. (Cf. 3rd par. under 3.) But after the exodus, and at least until the establishment of the monarchy, the year was reckoned from the spring (Ex. 12:2).

And a second answer to this question of authorship points the finger at Moses as the early author, because he was an early writer. In the forty years during which Moses was leader of Israel, he wrote several books--writings to which Jesus Himself refers (John 5:47). The second law, as recorded in Deuteronomy, was written by Moses, and this book was placed in the side of the ark of the covenant (Deut. 31:24-26). Moses also made a register of the wilderness episodes, and in this memorial he was commanded to re-

cord the battle with Amalek and the injunction of the Lord concerning him (Ex. 17:14). After the giving of the law on mount Sinai, additional judgments and precepts were spoken, and all of these were transcribed by Moses before the people made their covenant with Jahweh (Ex. 24:4).

6 Moses also wrote songs. One is recorded which the people sang after they crossed the Red Sea (Exodus 15), and another, which Moses wrote just before his death (Deuteronomy 32). We also have his inspired blessing upon the tribes.

3 It is the chronology in Genesis that calls for an early writer--certainly not a late one, ~~And it therefore seems consistent to lay the authorship at the door of Moses, ancient scholar and prophet,~~ even though modern criticism assigns this book to early centuries of the monarchy.[1] For ~~in this period~~ under the monarchy the people of Israel were not only numbering their calendar months from the spring, but they also left on record old Canaanite names of the months as witness. Three of these agricultural names are mentioned in the reign of Solomon--Zif, Bul, and Ethanim (1 Kings 6:1,38; 8:2). Zif, signifying the brightness of flowers, Bul, meaning showers of rain, and Ethanim, corresponding to perennial rivers, are appropriate names for the second, eighth, and seventh months respectively. Cf. Gesenius. These names are repeatedly found in Syrian inscriptions.[1-a]

4 The inference is therefore obvious that an author or redactor living in the early period of the Jewish monarchy, in outlining flood chronology, would necessarily employ the current names of the months in his own time; and, furthermore, would inevitably number the months from the spring--a Jewish calendar custom which has continued from the exodus even to the present day. But these calendaric features are contrary to Genesis chronology, as will

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[1] Driver, S.R., "An Introduction to the Literature of the Old Testament," p. 125. Seventh edition. New York, 1898.

[1-a] Wilh. Dr. Freih. v. Landau, Beiträge zur Altertumskunde des Orient, II und III. Leipzig, 1905.

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was written, and in it a record of our earliest biblical calendar was placed.

be shown in the progress of the study. Therefore, ~~Moses in the desert of Horeb, in~~ the interval between ~~life in Pharaoh's court~~ Israelite bondage in Egypt and the exodus, represents about the only period that would supply a current calendar in harmony with the chronological description of the flood.

7 In the ninetieth psalm, Moses is reminiscent at seventy years of age. He looks back a thousand years, speaking of "yesterday--a watch in the night." He thinks of the flood as a judgment from God, pleading with erring children of men to return.[2] It was centuries after the flood that the book of Genesis [illegible] existence of an exceedingly early calendaric record[3] that was ~~necessarily~~ possibly constructed by calculation of the new moon instead of by actual observation. If not based upon more ancient tabulation. And of equal importance is the fact that the flood calendar offers proof in itself for its own particular details of construction, as will later be demonstrated.

Ten years must pass before Israel escapes from bondage; for Moses was eighty years old when he stood before Pharaoh

9 It seems exceptional that a calendar of so great authority should lie recorded almost in the opening pages of Scripture, and yet its intrinsic merit go unrecognized. Doubtless one reason for this oversight is the repeated insistence that the 150-day period of prevailing flood waters represents five consecutive 30-day calendar months; that this arrangement of time was solar, and that it could not therefore belong to later Jewish cycles. Then the conclusion has commonly been drawn that the Noachian age employed this length of month; that while Noah was in the ark he could not see the new moon on account of rain and fog, and that consequently he calculated the whole period of the

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2 "During the earliest period Egypt was unacquainted with true writing. In the many hundreds of graves from this era not the slightest trace of any sort of script has ever been discovered."--Steindorff, George, and Seele, Keith C., When Egypt Ruled the East, p. 116. Chicago, 1942.
"No written records have been found at Jericho itself. ."--Garstang, John, and Garstang, J.B.E., The Story of Jericho, p. 68. London, 1940.

3 The first dynasty of Babylon with its records of Ammizaduga comes after 2000 B.C.

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was written, and in it a record of our earliest biblical calendar was placed. The decades which Moses spent in the desert of Midian were therefore rich in knowledge to students of chronology.[1] Before the flood and for some time after, there had been no books;[2] but there were teachers whose existence was measured by centuries. Methuselah knew Adam for nearly two hundred and fifty years, and Noah knew the family in which Abraham was reared. By this means knowledge was extended at a time when books had not yet been written. And one of the earliest testimonies concerning this marvelous period comes from the hand of one who must have lived many centuries later. This fact alone is of outstanding importance to the genesis of ancient calendation, for it reveals the existence of an exceedingly early calendaric record[3] that was possibly ~~necessarily~~ constructed by calculation if not based upon more ancient tabulation. of the new moon instead of by actual observation. And of equal importance is the fact that the flood calendar offers proof in itself for its own particular details of construction, as will later be demonstrated.

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deluge on a 30-day month basis. However, this common but questionable view is not accepted by all.[4]

9 And in addition, a second erroneous hypothesis has complicated the problem of ancient Jewish time, namely, the insistence that the earliest Jewish dates were entirely based upon observation of the new moon, and that not until after the post-exilic period did calculation come into the reckoning. This assumption would place early calendation upon an empirical basis, in support of which there is not to be found a sufficient number of early Jewish records, such as have come down from the first dynasty of Babylon. In the Babylonian tablets and documents, ~~long buried in the earth,~~ lies the chronological evidence that binds together historical events in the millennium preceding the time of Moses, although the result is as yet a sort of continually varying chronology. ~~And unless, for example, the successive observations of the planet Venus during the reign of Ammizaduga can be tied to a parallel chronological series, these celestial phenomena cannot fix the actual limits of his period.~~

10 ~~However,~~ Yet there is always the possibility that an unusual and seldom-repeating relationship of sun, moon and planets will become so joined to earthly events as ~~record~~ that a chronological outline is thereby established. This is an indisputable crux to historical research, which therefore for some time has been interned in the field of astronomy and calendaric study in addition to its field of textual criticism and interpretation. The vital importance of technical science to the genesis of history and chronology has been well put by Edward Sachau:

"No number in any chronological table can be considered correct, so long as it is not proved by computation to be so, and even in the simplest historical narrative the editor and translator may most lamentably go astray in his interpretation, if there is something wrong with his method of research." [5]

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[4] Schiaparelli, G., "Astronomy in the Old Testament," pp. 126,127. Oxford, 1905. Schwarz, Adolf, "Der Jüdische Kalendar," p. 8. Breslau, 1872.

[5] Albîrûnî, "The Chronology of Ancient Nations," Preface, p. vi. Tr. Sachau. London, 1879.

11 There are only a few calendar dates in the Bible--less than a hundred altogether. And these are not evenly distributed, some periods being marked by a comparatively larger number than others. In the account of the flood and exodus, in the prophecy of Ezekiel, the post-exilic books, and the gospels, there is a sufficient number of time divisions to each period to frame the form of calendar employed. It can be demonstrated that these various calendars are all based upon the lunar month, but that they principally differ in one respect--the time of beginning the civil year. Under the administration of Moses, current time--both civil and religious--was reckoned from the first month.[6] And that this month was lunar is shown from the fact that the day ended at evening, when levitical uncleanness ceased. This ancient chronicle covers a little more than two nineteen-year cycles, that is, to the conquest of Canaan. Biblical history does not note any further calendaric change until the time of the kings, under whose reigns there are very few dates, but instead, ~~#~~ long series of king lists, which, for the ministry of Judah, began the regnal year in the autumn.[7] With the Israelite kingdom, however, another beginning for the king's reign was ordained, which may have been ~~was obviously~~ based upon Egyptian influence over Jereboam, when, in the tenth century B.C., the Egyptian seventh month approximately coincided with the Jewish eighth.[8]

12 A departure occurs in Ezekiel's chronology, which is characterized by a large number of captivity dates, planted upon a "regnal" year representing both the period of the captivity and also that of the captive king. With possibly one exception,[9] Ezekiel's dates all denote civil events; but, con-

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6 "This month [Abib] shall be unto you the beginning of months: it shall be the first month of the year to you." Exodus 12:2.

7 For example: The battle of Carchemish occurred in the fourth of Jehoiakim at the time of the Nile flood (Jer.46:2,7). In Jer.36:9, it was the fifth of Jehoiakim in the ninth month. The regnal year therefore changed in Tishri.

8 In 200 years or more back from 747 B.C., 1 Thoth would advance to the last of April--to a position nearly a month later than the average 1 Nisan.

9 Ezekiel 40:1, where "tenth day of the month" doubtless = the day of atonement.

trary to the interpretation of some, must necessarily begin in Tishri, or else they do not conform to the chronological outline of ~~his~~ the period. The civil dates of Nehemiah and Ezra are outstanding because they begin the reign of ~~a foreign~~ Persian king (Artaxerxes I) ~~in the~~ upon the autumn--a beginning Jewish calendar fact recognized by many chronologers.[10] On the other hand, the regnal year of Darius I is counted from Nisan by the prophets Haggai and Zechariah.[11]

13 And earliest of all ancient reckonings ~~in actual point of time,~~ the pentateuchal flood chronicle takes its place with the various forms of calendars just described. In actual point of time, It belongs to the most primitive period of biblical history--the patriarchal age; but the large number of dates that occur in the description of the flood at once give it an historical character. This is of untold interest and importance to chronology. ~~The analysis continues as follows:~~

1. The text in Genesis seven and eight.
2. Calendars at Moses' disposal.
3. Season for beginning the flood.
4. Description of the flood calendar.
5. Significant importance of the flood calculation.

1. Calendars at Moses' Disposal. For the first forty years of Moses' life, he was educated as an Egyptian, and was known as such (Ex. 2:19). Hence it is consistent to look to ancient Egypt for a possible source of the calendar he would employ. Neugebauer describes the ancient Egyptian calendaric system as a "peaceful coexistence of different methods of defining time moments and time intervals in different ways on different occasions."[12] He further explains that in the days of unified Egypt, there were in use a real lunar calendar, and for practical needs a schematic calendar of 12 months of 30 days each, regardless of the moon's course. He goes on to say that "no one was able to predict exactly the moon's behaviour, and a schematic calendar was

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10 In Neh. 1:1 and 2:1, the Persian year does not change between the ninth month Chisleu and the subsequent first month Nisan. It must therefore have changed in Tishri, according to Nehemiah's calendar.

11 In Hag. 1:1 and Zech 1:7, the Persian year does not change between the sixth and eleventh months. It must therefore have changed in Nisan.

12 Neugebauer, O., "Origin of the Egyptian Calendar," Journal of Near Eastern Studies, Vol. I, No. 4, p. 402. October, 1942.

therefore quite necessary wherever economic life demanded regularity and simplicity." [13] And he further and rightly insists that "only a highly developed theoretical astronomy is able to determine the further course of a lunar calendar;" and that "not before the very last centuries of Babylonian history was a satisfactory treatment of the sun and moon developed sufficiently accurate to predict the length of the lunar months for an appreciable time in the future."[14]

These conclusions of Dr. Neugebauer are significant. Among others in this field of research, he mentions the investigations of Kugler, Brugsch, Winlock, Thureau-Dangin, Borchardt. ~~But returning now to Moses in the desert of Horeb.~~ Moreover, Moses, although an ancient Jewish scholar, he was primarily "learned in all the wisdom of the Egyptians" (Acts 7:22). And, as an Egyptian wise man and heir to the throne of Egypt, he was doubtless also learned in early Babylonian astronomy relating to observation of the moon and planets. For in his day intercourse between Egypt and Babylon was frequent, and ~~the~~ caravans had long been ~~were constantly~~ passing to and fro. It was a "goodly Babylonish garment" that Achan pilfered at the fall of Jericho.

In any event, Moses must have had at his disposal the two recognized caldars of Egypt upon which to plant his series of dates pertaining to the flood year. Under the influence of the divine Spirit, he reckons ~~calculates~~ back many centuries in time, and ties his record to the very simplest form of a lunar calendar. He does not employ the economic Egyptian calendar with its wandering 30-day month. Neither does he make use of the empirical observations of Babylonian astronomy--he does not even introduce the ancient names of the Babylonian months.[15] He does instead number his months, after the manner of both

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13 Idem, p. 400. 14 Idem.

15 "Wenn auch die Namen der Monate vor -- 2400 nicht dieselben waren, wie die bekannten spateren (Nisan etc.), der erste Monat des Jahres begann doch etwa 8 Tage nach dem Aequinox."--Schoch, Karl, Planeten-Tafeln fur Jedermann, p. XXXIX. Berlin-Pankow, 1927.

Israel and Egypt in his own day, and fixes their length by a series of parallel periods and weeks. And he thereby establishes both lunar and solar constants relating (1) to the length of the lunar month and year, and (2) to the length of the solar or tropical year.

With reference to flood history, it does not appear to be known whether the writer of Genesis had sacred ~~records~~ sources, such as had Ezra, for example, by which to construct a chronicle, although the records in Genesis are spoken of as "books." Details in chronology had very probably been handed down from Shem direct to Abram, whom the son of Noah must have known for at least seventy-five years in Haran. And, as a little child, Moses no doubt heard the history of the patriarchs at his mother's knee. In the Egyptian court, the Babylonian traditions of creation and the flood may have been frequently rehearsed; they had been written in clay long before Moses fled into Midian. But even so, it does not yet seem possible to furnish convincing evidence that Moses or any other writer composed the book of Genesis and constructed its chronology from any other source than that supplied by the Angel with whom he conversed. And thus the Bible gives to history an inspired calendar of about the earliest event known.

Those who do not credit Moses with the authorship of Genesis, and assign the writing to a later period, have to assume that the flood calendar was calculated over a much longer time than implied in this study. The important point is, however, that the new moons in Genesis must have been computed instead of being based upon ~~written records of~~ observation. But whatever the source of the dates in Genesis seven and eight, whether direct from the sublime oracle of God, or from an actual computation by the writer ~~Moses~~ himself,[16] or from an Abrahamic record, it would have been absolutely impossible for one ~~Moses~~ to have calculated or checked the series, unless he knew (1) the exact year of the flood; (2) the mean length of

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[16] Just as possible as in the twentieth century when the exact constants governing the heavenly bodies have only been known since the laws of gravitation were discovered.

the year, both lunar and solar; and (3) the mean length of the moon's course around the earth. And, in addition, he must also have understood the action of the lunar and solar tides in order to have numbered the months in harmony with them and the events described.

Both the chronicler and the writer of Kings mention the ancient annals upon which they based their chronology. But in this respect the book of Genesis appears to be different, and so also its chronicle; for there is not clear evidence that the Jewish writer had in his hand written sources which had come down to him from his own people. Consequently, all the more remarkable and important is the biblical record that furnishes a series of astronomical dates, obviously calculated to an event seen centuries before the time of Moses.

2. Season for Beginning the Flood. Josephus dates the flood season in the autumn. He says:

"This calamity happened in the six hundredth year of Noah's government, in the second month, called by the Macedonians Dius, but by the Hebrews Marhesvan; for so did they order their year in Egypt." [17]

Philo is another important witness supporting the order of months in Genesis. He himself commonly numbers Tishri as the first month. (It is numbered seven in the modern Jewish calendar.) But Philo recognizes that at the time of the exodus God commanded Moses that the passover month should be designated as the first. With reference to the paschal month, Philo writes:

"This month, being the seventh both in number and order, according to the revolutions of the sun is the first in power; on which account it is also called first in the sacred scriptures." [18]

These statements of Josephus and Philo (and others are further confirmed by the Talmud, [19] and they conclusions appear to be consistent for the following reasons:

a. If the flood months began in the autumn, they would then coalesce with the seasons as they have always been in the Near East--rain in fall and spring, and drought in summer.

Morrison
Rasmussen

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17 Josephus, Antt. I.IV.3

18 Philo Judaeus, "The Life of Moses," vol. iii, pp. 171, 284. London, 1855.

19 Rosh Hashana 11b - 12a (Babylonian Talmud).

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The following are other authoritative statements that support an autumn month as the first in earliest times:

1. Karl Schoch--
"Wenn auch die Namen der Monate vor – 2400 nicht dieselben waren, wie die bekannten späteren (Nisan, etc.) der erste Monat des Jahres begann doch etwa 8 Tage nach dem Aequinox."--Planeten-Tafeln für Jedermann, col. xxxix. Berlin-Pankow, 1927.

2. Martin P. Nilsson--
"For if the series of numbered months begins in spring, yet there are also indications of an earlier beginning in autumn."--Primitive Time-Reckoning, London, 1920, 234.

"The rule for the beginning is given in Ex. 12:2. . . This reads like a prescription for the reform of the calendar, when it is remembered that in all places the Feast of the Passover was dated in relation to the month of ears (chodesh ha-abib)."--Ibidem, 273.

3. Gustaf Dalman--
"In Übereinstimmung mit dieser Bedeutung der Plejaden steht die jüdische Beziehung des Beginnes der Sinflut am 17. des zweiten Monats (1 Mos.7:11) auf den 17. Marcheschwan (November) als den Tag des Frühuntergangs des Sternbildes kīmā. Der Palästinische Talmud[a]) bezeugt dies mit den Worten: "R. Eliezer said, 'That day was the seventeenth of Marchesvan, a day on which the constellation of Pleiades rises at daybreak, and [the season] when the fountains begin to fill. . .'"--Rosh Hashana 11[b] - 12[a]. ("Arbeit und Sitte in Palästina, Gütersloh, 1928, 123. 1 Band.)

4. Benno Landsberger--
"Dass der burgerliche Jahresanfang, der ja durchaus nicht immer mit dem religiösen übereinstimmen muss, in altbabylonischer Zeit derselbe wie in assyrischer und neubabylonischer, also idealiter der Frühlingsbeginn, war, würde zuerst von de Genouillac, TSA xviii, Anm. 3, bestritten."--Der Kultische Kalender der Babylonier und Assyrer, Leipzig, 1915, 18.

5. F.K. Ginzel--
"Radau glaubt, dass das Jahr ursprünglich mit DUMU-ZI (dem 7. Monate in Kol. II), entsprechend dem Tišritu (dem jüdischen Tišri) begonnen worden sein könnte, denn der 7. Monat heisst auf babylonischen Tafeln der 3. Dynastie auch a-ki-ti = Neujahrsfest . . . Das alte babylonische Jahr würde also mit dem Herbstäquinoktium begonnen haben; zur Zeit Gudeas sei der Jahresanfang auf Frühjahr, den Monat SE-IL-LA (entsprechend dem jüdische Nisan) verlegt worden."--Handbuch der mathematischen und technischen Chronologie, 1 Band, Leipzig, 1906, 115.

6. G. Schiaparelli--

"Ancient months	Ancient order	Later order	Equivalent modern names	References in Old Testament
Ethanim	First mo.	Seventh mo.	October	1 Kings 8:2
Bul	Sec. "	Eighth "	November	1 Kings 6:38
Abib	Sev. "	First "	April	Ex.23:15
Ziv	Eighth "	Second "	May	1 Kings 6:1,37 "

--Astronomy in the Old Testament, Oxford, 1905, 105.

7. Hugo Radau--

"Above we saw that אביב although originally the seventh, became in later times = ניסן as first month. But אביב corresponds, as regards its meaning, to ŠE-IL-LA; hence ŠE-IL-LA must have been in the oldest times the seventh, and later on the first month of the year. GAN-MAŠ, it was said, corresponds to זו, which latter again became later on the second = אייר; hence also GAN-MAŠ must have been originally the eighth, and later on became the second month. .

"While these changes took place, it happened the new months were introduced. . .Othere lost their original place, as for instance, ŠE-KIN-KUD and ŠU-KUL. The history of this latter month is especially interesting. In List A it is the fifth; in List D, on the other hand, the fourth. In the Assyrian period, or possibly before, it was even thrown together with the eighth month. . .Thus it happened that the month of 'sowing' (ŠU-KUL) became the 'child of life' or 'true child' (Du'uzu, תמוז)."--Early Babylonian History, London, 1900, 297, 298.

8. John David Michaelis, pp. 26,27.

9. Buxtorfius, p. 368 = citing Kepler, "Eclogues", p. 90.

10. Buxtorfius, p. 367 = citing Clavius.

11. Stephen Langdon, "Babylonian Menologies and the Semitic Calendars," pp. 23, 24; 28, 29, 97. Schweich Lectures, 1933. Cf. also p. 66 for "prehistoric calendar"

b. According to the numbering of the months as given in Table A.1, the astronomical tides harmonize with the events described. If the order of the months is reversed, the tides do not check.

c. The numbering of the months as in Table A.1, is a key to the length of the months when compared with the periods; but by reversing the order of the months, and numbering from Nisan, the key thereby becomes useless, as will be shown later.

d. If Noah had left the ark in Iyar as the second month, he would obviously have had to wait at least seven months before seeding the ground. But coming forth in Hesvan, he could immediately prepare for the November seeding of wheat, as is customary in the Near East, and soon after, for the January sowing of barley. That the seasons were fully established after Noah left the ark is implied in Gen. 8:22.

e. The divine law in Ex. 12:2 that from the time of the first passover the months were to be numbered from Abib (Deut. 16:1), indicates that previously they had been differently numbered.

And a further argument relates to the position of the Egyptian month Thoth in the time of the exodus, when it hovered around the autumnal equinox. This can be shown from the record of Josephus,[20] which states that the Egyptians called Nisan of the exodus Pharmuthi (8th month), thus bringing the subsequent Thoth in September-October. An approximate result can also be obtained by reckoning back from the Nabonassar era, when 1 Thoth occurred on Feb. 26, 747 B.C.[21] And if Moses had projected the Egyptian schematic calendar of 30-day months back to the flood period, in the intervening years, the first month Thoth would have advanced past the spring equinox at least. Consequently, the lunar calendar used by Moses, both in the case of the exodus and in that of the flood, had its new year at the ~~opposite pole~~ nadir of the Egyptian economic scheme of counting time. By divine command Israel was evidently to be cut loose from the idolatry of Egypt even with respect to the calendar.[22]

3. Description of the Flood Calendar. In the accompanying calendar table

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20 Josephus, Antt. II.XIV.6.

21 In the approximate seven or eight centuries back from 747 B.C. to the exodus, the Thoth new year would advance toward 200 days, which, reckoned forward from February 26, would end in September.

22 Brugsch has shown that every day of the ancient Egyptian calendar was named after an Egyptian god. ("Inschriften Altaegyptischer Denkmaeler," pp. 49-51. Leipzig, 1883.)

A.1, the numbered months, dates, and periods belong to the record ~~of Moses~~ in Genesis. The lunar names only have been introduced according to Josephus and Philo, as previously explained. To each lunar month has been assigned a specific number of days in harmony with the lunar constant long recognized by astronomy.[23] Because it is inconsistent to end the lunar month on the half day, alternating months of 30 and 29 days are marked off in the table. The calendar moon is thereby made to conform sufficiently with the real moon and her position in the sky. It then remains to demonstrate that the schematic periods of ~~Moses'~~ this record--40 days and 150 days--are in agreement with the assigned length to each month. (Cf. Table A.2 ff.)

The deluge began in the year 600 of Noah's life (Gen.7:6), and the year changed to 601 on the first day of the subsequent first month (Gen.8:13). This change of year on the 308th day of the flood is indisputable evidence that the calendar was intentionally based upon both the lunar and solar years. For, by adding the 46 days in Tishri and Hesvan before the rain began, to 308, we

Insert on page 10

Other early instances in Genesis for an autumn new year are (1) in Gen. 26:12, where Isaac sowed a field in Philistia, and "in the same year" received a hundredfold. In the Near East, seeding is in the fall, and harvest is in the summer. In order therefore to have both the sowing and the harvest all in one year, the new year obviously must have come the first of Tishri. (2) Again, in Gen.47:18 the year had ended, and the Egyptians came to Joseph "the second year," saying, "Give us seed that we may live." And Joseph did so (verse 23). Hence the new year must have come just before seeding, that is, in Tishri.

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month as 29 1/2 days + 1/33 day. or 29.530303 days. He was a Greek astronomer, but based his calculation upon Chaldean astronomy. ("Elementa Astronomiae," ch. XVIII. Tr. Manitius. Lipsiae, 1898.)

The synodic constant of modern astronomy is 29.530588 days.

A.1, the numbered months, dates, and periods belong to the record ~~of Moses~~ in Genesis. The lunar names only have been introduced according to Josephus and Philo, as previously explained. To each lunar month has been assigned a specific number of days in harmony with the lunar constant long recognized by astronomy.[23] Because it is inconsistent to end the lunar month on the half day, alternating months of 30 and 29 days are marked off in the table. The calendar moon is thereby made to conform sufficiently with the real moon and her position in the sky. It then remains to demonstrate that the schematic periods of ~~Moses'~~ this record--40 days and 150 days--are in agreement with the assigned length to each month. (Cf. Table A.2 ff.)

The deluge began in the year 600 of Noah's life (Gen.7:6), and the year changed to 601 on the first day of the subsequent first month (Gen.8:13). This change of year on the 308th day of the flood is indisputable evidence that the calendar was intentionally based upon both the lunar and solar years. For, by adding the 46 days in Tishri and Hesvan before the rain began, to 308, we get 354 days, which represent the number in a common lunar year; while, by adding to 308 the 57 days from the change of year to the time Noah left the ark, we get 365 days, which correspond to the solar year. Thus we have the earliest historical records for the length of the lunar and solar years, and at the same time the earliest precedent for beginning the Jewish civil year in the autumn. Let us examine with further detail the outline in Table A.1, particularly with respect to the length of the various months.

If the lunar portion of the flood period had been a leap year, then it would have contained 13 months, and the 13th month would have been introduced ~~either~~ probably as an additional Adar ~~or Elul~~. If Adar, then Nisan in which the ark

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[23] Even in a late century B.C. Geminus computed the length of the synodic month as 29 1/2 days + 1/33 day. or 29.530303 days. He was a Greek astronomer, but based his calculation upon Chaldean astronomy. ("Elementa Astronomiae," ch. XVIII. Tr. Manitius. Lipsiae, 1898.)
The synodic constant of modern astronomy is 29.530588 days.

rested would necessarily have been numbered the eighth month instead of the seventh. And furthermore, in event of a lunar leap year, Noah must have left the ark on the 27th day of the first month, instead of the second, if he were to carry out the obvious intention of the annalist to mark off the 365 days belonging to the solar year. It is therefore conclusive that the length of lunar year in Column "a" is common lunar, and not a leap year.

But in every lunar cycle, the moon's position is such as frequently to demand an additional leap day, thus making the lunar year 355 days long. And in such a case the extra day is customarily added to Hesvan, which then contains 30 days. The question at once arises whether Hesvan in which the rain began had 30 days. The following table answers this question, and shows that the additional day in the flood calendar would have brought confusion into the figures of the writer of Genesis.

Table A.2 False Arrangement for Hesvan

(2)	Hesvan		16	=	Days in Hesvan before rain began.
		30	1	=	Rain on 17th = 1 calendar day.
			13	= 40 days	
(3)	Kisleu	30	26		
			4	=	Remaining days in Kisleu.
(4)	Tebet		29		
(5)	Shebat		30	= 150 days	(five schematic 30-day periods)
(6)	Adar		29		
(7)	Nisan		30		
(8)	Iyar	29	28		
			1	=	One day belonging to Iyar, but not to the 150-day period.

Demonstration. In the foregoing table, the 30 days in Hesvan make the 40-day period end on 26 Kisleu, and the 150 days, on 28 Iyar. Hence, the remaining 4 days in Kisleu must be added to the months 4 to 8 inclusive in order to complete five 30-day periods, which are the equivalent of 150 days. But Tebet, Adar, and Iyar can be allowed only one extra day each, for no lunar month ever equals more than 30 days. Therefore, an additional day in Hesvan finds no month in the 150-day period to which it can be added, and thus it would bring confusion into the figures of Moses. Accordingly, the two periods--40 days and 150 days--exactly lock in place the length of each month.

Hence the consistent conclusion that the lunar portion of the flood year was a common lunar year, equaling 354 days, and not 355 days. And with the understanding that Tishri is the first month, the lunar year would obviously have to begin with Tishri, and end on the last day of Elul. This is in harmony with the change of year recorded in the text. Lunar calculations are the most exact of all ancient forms of calendation. And a lunar calendar, like every other form, has to give account of every day brought into existence by the revolution of the earth. In this twentieth century it is frequently argued that somewhere in the dim past (sic!) a day was lost. Astronomers deny this assumption. But in addition, the lunar reckoning ~~of Moses~~ in Genesis seven and eight also denies the challenge.

Another important constant is also present in Column "b" of Table A.1. By subtracting the balance of 13 days in Hesvan from the combined periods that equal 190 days, an equation can be formed as follows:

6 lunar months = 177 days
∴ 1 mean month = 1/6 of 177, or 29.5 days.

These 29.5 days represent the mean calendar length of the lunar month. Therefore, on the calendar, two months = 59 days. And because the month must necessarily end on the even day at sunset, alternate months of 30 and 29 days are the best answer to the moon's varying but exact motion. And this fact ~~Moses~~ the writer of Genesis evidently intended to stress, and he accomplished his purpose by introducing the two periods, which absolutely fix the order of the series. For if the order of the months should be changed, as given in Column "b", and the 30-day months replace the 29-day months, and vice versa, then an extra day appears for which there is no month to which it can be added, and yet be in harmony with the periods. This is a very simple, but ~~very~~ effectual check.

And furthermore, on the basis of the mean month = 29.5 days, the length

of every month in the Genesis calendar can be ascertained. For example, 8 months from Tishri to Iyar (inclusive) = 8 x 29.5 days = 236 days. Now add up on Table A.1 the months from Hesvan to Iyar, and get 206 days. Subtract the two results and get 30 days for Tishri. Thus is it proved that the arrangement of the months under the 190-day period is unchangeable, and it therefore becomes a pattern for the simplest form of the lunar year such as we find in Genesis seven and eight. It is a 354-day year, alternating 30- and 29-day months.

In Column "b" of Table A.1, the solar year is also outlined as heretofore described. A period of exactly 365 days extends from 17 Hesvan, when the rain began, to 27 Hesvan, when Noah left the ark. These two limiting dates mark out a precise solar year during which the flood prevailed. The difference of 10 days between the two limiting dates[24] is sufficient evidence that Moses actually intended to leave on record the length of the common solar year as a companion constant to the common lunar year. Schiaparelli is one of few who have taken note of this coincidence:

"-- we cannot doubt that this writer [Moses] knew the year of 365 days. In fact, he makes the flood begin in the 600th year of Noah's life, on the seventeenth day of the second month; and the definite drying of the earth and the end of the flood he puts in the 601st year of Noah's life, on the twenty-seventh day of the second month. These months are certainly those of the Jewish calendar, that is to say, lunar periods. The flood would therefore have lasted twelve moons and eleven extra days. It is hard not to recognize here the intention of making the flood last for an exact solar year; for if 354 days be assumed for the duration of 12 moons (they amount in reality to 354 days, 9 hours) the total duration of the flood comes to 365 days." [25]

Consequently, the calendar in Genesis is also an acknowledgment of the length of the solar year. It is indeed thrilling to find these astronomical constants in the biblical text. They represent very ancient computations in calendar science. They would appear to have been introduced early in the

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[24] Actual difference between 12 moons and a solar year is 10.875 days.

[25] Schiaparelli, G., "Astronomy in the Old Testament," p. 127. Oxford, 1905. (The exact solar constant = 365.2421987 days.)
Joannis Kepleri, Opera Omnia, Volumen VIII, Pars. I, Francofurti, 1870, 268

pages of Holy Writ for the express purpose of pointing to the lunar form of calendar as the one to be used in biblical chronology.

Another significant feature pertaining to the Genesis calendar is Noah's week, which probably began when Noah entered the ark on 10 Hesvan. It would be a consistant conclusion that the patriarchal week always began the same as at creation--and the same as has persisted even to the twentieth century. Possibly Noah would intern his family at the beginning of the week, while the rain commenced on the eighth day after (Gen. 7:10). But in any event, it is significant to note that if the successive days of the flood year be marked off by seven-day weeks on the lunar calendar in Genesis, every date but one (first of Tammuz) will coincide with the first day of Noah's week. This calculation is of value, for it indicates that the seven-day week is an historical institution in actual practice in very ancient times. It also assists in cataloging the flood as an historical event--not a legend.

The identified seasons of the flood calendar together with the recorded dates make it possible to discover both lunar and solar tidal influence in connection with the resting of the ark. It is hard not to recognize this ~~important~~ astronomical characteristic in the ~~Moses'~~ Genesis chronicle. Aside from the moon's phases--new moon and full moon--upon which every lunar calendar is based, ~~Moses~~ the author of Genesis seems to have introduced into this ~~his~~ first calendar at least one tying relation to the moon's orbit. This synchronism has reference to the resting of the ark over the peaks of Ararat on the 17th day of Nisan. On this day the moon was nearing her last quarter when tidal influence is small.[26] The lunar tide

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26 "Neap tides occur at quadratures."--Barlow and Bryan, Mathematical Astronomy, p. 386. London, 1934.

"Spring tide occurs about the full and change of the moon, neap tide occurs at the half moon, and the range at springs is usually about three times as great as that at neaps."--Darwin, George, The Tides and Kindred Phenomena in the Solar System, p. 159. Boston, 1898.

"The neap tides, at the first and last quarters of the moon, have the smallest range,--usually rather less than half that of the spring tides."--Russell, Dugan and Stewart, Revision of Young's Manual of Astronomy, p. 292. Boston, 1926.

has the smallest range when the moon is gibbous, and also in apogee, that is, farthest from the earth. And the lunar tide is least marked by violent currents, when, in addition, the half moon is on the equator.[27] In face of these facts, it does not seem irrelevant or absurd to reason that divine guidance, in arresting the ark, would allay the wind and choose positions for both sun and moon most conducive to a quiet haven--one free from swift tides and vicious currents. The 17th day of the lunar month, being in close proximity to the last quarter, is therefore a significant date. And if, at this point of time or soon after, the half moon were in apogee, and also on the celestial equator, the moon's tide-raising force would be the least in range, and the diurnal inequality, zero. This position of the half moon in the last quarter of Nisan, together with the decreasing solar tide in the immediate subsequent summer months, would result in a lowering of all the tides until the earth reached aphelion.

Under these conditions, an even flow and ebb of the astronomical tides would prevail during the summer, thereby enabling the hitherto storm-tossed ark to move about in a small compass until finally surrounded by the mountains of Ararat. The following Table A.3 demonstrates how the tides of the flood year would be identifying in character particularly during the summer season, when the solar tide was on the decrease:

APPROXIMATE DATING OF THE MOON'S ANOMALY IN THE FLOOD YEAR

	Tishri 16	= Perigee	Adar 5	= Perigee		
	Tishri 30	= Apogee	Adar 18	= Apogee . . .	Neap tide near	
Rain on 17th	Hesvan 13	= Perigee	Nisan 3	= Perigee		
	Hesvan 27	= Apogee	Nisan 17	= Apogee . . .	Neap tide near	
	Kisleu 12	= Perigee	Iyar 1	= Perigee		Solar tide decreasing
Perihelion (ca)	Kisleu 25	= Apogee	Iyar 15	= Apogee		
	Tebet 9	= Perigee	Iyar 28	= Perigee		Spring tides low
	Tebet 23	= Apogee	Sivan 14	= Apogee		
	Shebat 7	= Perigee	Sivan 28	= Perigee		Aphelion (ca)
Neap tide	Shebat 21	= Apogee	Tammuz 11	= Apogee		

27 "The fact that the range of the two successive tides is not the same is of great importance in tidal theory; it is called the diurnal inequality of the

Cf. Ferguson, Vol. 1, p. 266.

Demonstration. On 17 Nisan, the spring tide of full moon was already several days in the past, and the moon was approaching neap tide in the last quarter when the "ark rested." About the time of the Sivan conjunction, the solar tide reached an all low for the year, making the accompanying spring tide lower than usual. The earth was in aphelion about the time the peaks of Ararat appeared.

But if the months of the flood calendar should be reversed, and made to begin in the spring with Nisan, then, according ~~to Moses'~~ to the reading in Genesis numbers, the ark would have rested on the 17th Tishri, and in the immediately ensuing fall and winter, the tides --both solar and lunar--would have had the most extreme range of the year.[28] On the contrary, with a fall-beginning calendar, the tides occurring in early summer after the ark rested, had the least range, and were most free from violent currents--and this at a time when the ark was still drifting about. In other words, by divine arrangement, the most propitious season of the year seems to have been was chosen for the arrest of the ark.

And again, it is hard not to reason that in the afore-going manner the astronomical tides performed their part in a conspiring effect upon the envelop of water covering the earth. This tidal argument brings agreement between the events described and the behaviour of both sun and moon, while it assigns to the flood year a definite astronomical character. Furthermore, it also demonstrates how the hand of God works in harmony with His majestic forces which hold the universe together.

4. Importance of the Genesis Calendar. The Genesis calendar is seemingly an historical document of rare antiquity; for it ties together the patriarchal age and the centuries of Israelite slavery under the pharaohs, when the

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tide."--Darwin, George, The Tides, p. 155.
"When the declination is zero, there are two equal tides daily."--Russell, Dugan and Stewart, Revision of Young's Manual, p. 293.
"The diurnal inequality conforms to the theory in vanishing when the moon is on the equator, and rising to a maximum when the moon is furthest north or south."--Darwin, p. 159.

28 "Both the spring and neap tides . . . are on the whole most marked when the Sun is near perigee, i.e. about January."--Barlow and Bryan, p. 386.
In postdiluvian centuries, sailing was dangerous in the Near East after the month Tishri. (Cf. Acts 27:9.)

autumn new year of the sons of Jacob belonged to the same season as the Egyptian Thoth new year. Obviously, ~~Moses~~ the author of Genesis had to choose between these two forms of calendation in order to construct ~~the~~ his record ~~in Genesis~~ in chronology. Let us summarize its various features of importance:

a. In this Genesis chronicle the dates in themselves are of telling significance. Noah and his family went into the ark a full week before the rain began. It was on the tenth day of the second month, and throughout the week Noah completed his preparations in the piercingly clear light of the full moon. Five months later the ark rested. In the last quarter of this seventh month, the winds and tides have ceased their violence, and the ark is moving about in a quiet haven of water over Ararat. When the patriarch finally leaves the ark, it is close to the end of the second month of the year, and the moon is new. Two, possibly three, days go by ere the horned moon slowly sets on the western horizon after the sun. In this series of dates in Genesis, all the phases of the moon are involved. A calendar based upon the moon reveals ~~many~~ astronomical events that would pass wholly unnoticed by using the wandering year of Egypt, or ~~by~~ the later Julian scheme of measuring time.

b. Of essential importance are the nature and character of the Genesis calendar. That this instrument was calculated, and not based upon new moon observation seems incontrovertible, and, furthermore, ~~for~~ there is no direct evidence that any written sources were at ~~Moses'~~ the annalists' command. ~~Furthermore~~ Moreover, if the months had been originally determined by consecrated and observed moons--fourteen in number--then they would most likely not have presented a regular series of alternate 30- and 29-day periods. And hereby is lifted an uncertainty which has hitherto challenged the whole problem of the ancient lunar month, namely, what happened to the calendar when the moon was not seen? Every scripture date is an answer to this question, for all the dates in the Bible respond to a calculat-

ed new moons, as the synchronisms reveal, and is now further supported by the reckoning in Genesis.

c. Of great interest to astronomy should be this very early record of indisputable solar and lunar constants--the mean length of the lunar month and year, and the mean length of the solar year. The original Jewish calendar in organized Israel was founded upon both forms of year. Its months were determined by the course of the moon, while the lunar year itself paced along with the sun's motion by means of the harvest festivals. The festal season remained stabulized in Jewry until after the time of Hillel II. In the mediaeval controversy between the various Jewish sects, one Yefet ben 'Ali the Karaite challenged the opposing Rabbanites that they had changed the due seasons of the calendar.[29]

d. Another feature of consequence pertaining to ancient chronology comes to light ~~in this flood study~~, namely, that there are apparently two ways of numbering the lunar months in the pentateuch: one, from Tishri, as in the Genesis computation--a method followed by the Israelite slaves in Egypt; and the second, from Nisan (the Abib of Moses), after the exodus, and continuing to the present day.

e. The Genesis calendar presents about the earliest precedent for beginning the civil year in the autumn. There are also arguments that the creation of the world occurred in this season. When the year's harvests were over, Moses speaks of the "going out of the year," and of the "revolution of the year," even though the calendar had already begun numbering its months from the passover month. With the exception of the records in Haggai and Daniel and Esther, Zechariah, the civil Jewish year would appear always to have changed its date in Tishri throughout biblical history.

f. And still another value in the Genesis chronicle is of material consequence to the chronology of history. For in this calendaric reckoning there oc-

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29 Birnbaum, Philip, "The Arabic Commentary of Yefet ben 'Ali the Karaite on the Book of Hosea," p. Philadelphia, 1942.

curs so exact an astronomical description of the flood year, that, in event of its approximate century being identified, the year itself can centainly be dated.

And why should not the investigator have as much confidence in the chronological records of Genesis as in the monuments upon which he pins his hope and courage in the serious conquest for uncovering truth? The harmony between these two lines, representing both the most ancient events of history and the youngest science of discovery, is not fully established; and frequently they appear wide apart in their witness. But, in turn, the Bible is in reality the basic field of inquiry, and at least one grounded upon indisputable internal evidence when understood. To Job, wisdom was a mine for silver and gold; to Jesus, a field with a hidden treasure--one to which at one and the same time the simplest way of life and the highest avenue of scientific endeavor have relation. Many times one does not even see evidence in a humble garb when seeking attestation in the skills of science. But both are indispensable to the discovery of truth.

Moon's Anomaly

Date April 26, −2404, 6:30 p.m. G.M.T. = $-2500+96^{y}116^{d}6.5^{h} = 96.3185^{y}$

Arg.	D	1	2	3	4	5	6	7	12	16	17	18	19
−2500													
S.V.													
1996													
116.271													
−1 Per.													
−Periods													
Sums													

Arg.	71	33	72	73	74	76	77
−2500							
S.V.							
1996							
116^{d}							
0^{d}.27							
Adj.							
Sums							

V Tab	Arg.		Date	
1				
2				
3				
4				
5				
6				
7				
Sum				
10				
11				
12				
13				
Sum				
I.F. =				
k (1st sum − 595) =				
Σ_8 = sum				

V Tab	Arg.		Date	
1				
2				
3				
4				
5				
6				
7				
Sum				
16 10				
17 11				
18 12				
19 13				
Sum				
I.F. =				
k (1st sum − 595) =				
Σ_8 = sum				

V Tab	Arg. at Date	Value
15		
16		
17		
18		
19		
21		
22		
Sum		
k (Tab. 19 − 200)		
9 (Const.)		
Σ_8		
Σ_9		
Tab. 24 Arg.		
" " Parallax		

V Tab	Arg. at Date	Value
71 15		
33 16		
72 17		
73 18		
74 19		
76 21		
77 22		
Sum		
k (Tab. 19 − 200) =		
9 (Const)		
Σ_8		
Σ_9		
Tab. 24 Arg.		
" " Parallax		

I.F. = _____ Tab. 23 VI

Date = 1900 + 2403.7 = −4303.7

7 Per. = 7 × 270.95 = 1896.65

Arg. = 1896.65 + _____

k = −.0000248 × −4303.7 = +.1067

17 NISAN (cir.)

Moon's Anomaly

Date April 21, −2428, 6:30 p.m. G.M.T. = −2500 + 72^{y} 111^{d} 6^{h}.5 = −2500 + 72^{y}.305

Arg.	D	1	2	3	4	5	6	7	12	16	17	18	19
−2500	26.9234^{d}	0.996^{c}	51.61	95.73	72.28	53.74	53.98	99.20	6.10	63.457	4.83	6.71	51.0
S.V.	− .0082	+ .002	− .27	+ .2	− .42	− .43	− .22	+ .17	− .02	− .430	+ .03	− .04	+ .2
1972	0.4864	4.738	121.77	33.25	65.42	58.92	107.47	32.02	17.23	187.490	47.80	26.00	14.47
111.271^{d}	22.6790	34.199	71.40	3.18	83.43	24.03	92.43	26.99	23.25	54.000	26.07	27.60	22.50
−1 Per.	29.5306	11.400	23.80	1.06	27.81	8.01	30.81	9.00	7.75	18.000	8.69	9.20	7.50
−Periods			−156	−116	−248	−128	−260	−100	−48	−251	−51	−38	−76
Sums	20.5500^{d} ✓	61.335 ✓	112.31 ✓	17.42 ✓	0.52 ✓	16.27 ✓	24.47 ✓	67.38 ✓	6.31 ✓	71.517 ✓	36.42 ✓	31.47 ✓	19.67 ✓
Sum	18.55	= 15 Nisan											

Arg.	71		33		72		73		74		76		77	
−2500	6.0	146.90	26.5	79.93	18.0	81.55	0.5	6.4	10.0	47.0	2.5	0.4	4.5	26.6
S.V.		− 23.90		− 1.58		+ 10.18		− 13.7		− 1.2		− 3.8		+ 1.2
1972	6.0	29.32	15.0	2.86	25.0	74.74	2.0	155.9	0.0	50.6	3.0	30.8	8.0	27.0
111^{d}	28.0	148.0	22.0	80.	15.5	14.0	5.0	138.0	3.0	41.0	4.0	11.0	10.0	20.0
0^{d}.27		118.8		52.92		58.9		149.6		38.3		31.8		35.1
−Per.	−27.5	− 24.	−59.	− 12.0	−31.5	− 68.	7.5	436.2	13.0	175.7	− 7.0	− 15.	−20.0	− 22.
Adj.	+ .5	− 220.	+ 1.	−196.	+ .5	−109.	+ 5	− 277.	+ 1.0	− 142.			+ .5	− 65.
Sums	13.0	175.12	5.5	6.13	27.5	62.37	8.0	159.2	14.0	33.7	2.5	55.2	3.0	22.9
109^{d}	26.0	148	20.0	80.	13.5	14.	3.0	138	1.0	41	2.0	11.	8.0	20.
Sum	11.0	175.1	3.5	6.13	25.5	62.4	6.0	159	12.0	33.7	0.5	55.2	1.0	22.9

V Tab	Arg.	20.0	Date 20.5	21.0	
1	61.	111	105	100	✓
2	112	43	35	30	✓
3	17	259	254	250	✓
4	0.5	65	65	66	
5	16	8	9	10	✓
6	24	15	15	15	✓
7	67	2	2	2	✓
Sum		503	485	473	
10	72	121	119	116	✓ 16
11	36	21	21	21	✓ 17
12	31	2	2	2	✓ 18
13	20	164	165	166	✓ 19
Sum		811	792	778	
I.F. = +.10		− 2			
k (1st sum − 595) = 10 (−)					
Σ_8 = sum		780			✓
17 NISAN					

V Tab	Arg.	18.0	Date 18.5	19.0
1	61	140	133	126
2	112	95	78	64
3	17	274	272	269
4	0.5	58	60	62
5	16	11	9	8
6	24	15	15	15
7	67	2	2	2
Sum		595	569	546
10	72	122	123	123
11	36	21	21	21
12	31	2	2	2
13	20	149	154	158
Sum		889	869	850
I.F. = +.10		− 2		
k (1st sum − 595) =		0		
Σ_8 = sum		867		
15 NISAN				

V Tab	Arg. at Date		Value	
15	13.0	175.12 + .5	2360	✓ 71
16	5.5	6.13	969	33
17	27.5	62.4 + 1.1	6403	✓ 72
18	8.0	159.2	510	73
19	14.0	33.7	371	✓ 74
21	2.5	55.2	5	✓ 76
22	3.0	22.9	37	✓ 77
Sum			10655	
k (Tab. 19 − 200)			0	
9 (Const.)			9	
Σ_8 (17th)			780	
Σ_9			11444	
Tab. 24 Arg.				
" " Parallax			54′ 13″	

V Tab	Arg. at Date		Value
15	11.0	175.1 + .5	4497
16	3.5	6.13	3092
17	25.5	62.4 + 1.1	5251
18	6.0	159	135
19	12.0	33.7	254
21	0.5	55	49
22	1.0	22.9	106
Sum			13384
k (Tab. 19 − 200) =			+ 6
9 (Const)			9
Σ_8 (15th)			867
Σ_9			14266
Tab. 24 Arg.			
" " Parallax			54′ 42″

I.F. = +.10 Tab. 23 VI

Date = 1900 + 2427.7 = −4327.7 $\bar{x}$ $\hat{k}$ = +.1073

7 Per. = 7 × 270.95 = 1896.65

Arg. = 1896.65 +

k = −.0000248 ×

D = 24.5502 (21 NISAN)

	71		33		72		73		74		76		77	
115d	32	148	26.0	80	19.5	14	9.0	138	7.0	41	8.0	11.0	14.0	20
Sum	17.0	175.1	9.5	6.13	31.5	62.37	2.5	96.2	2.5	49.7	6.5	55	7.0	22.9
D = 21.55														
112d														
Sum														

115th Day

V Tab	Arg.	24.0	Date 24.5	25.0
1	61.	108	116	125
2	112	29	35	43
3	17	237	234	230
4	0.5	60	58	56
5	16.	20	22	24
6	24	15	15	15
7	67	2	1	1
Sum		471	481	494
10	72	113	115	117
11	36	21	21	21
12	31	7	8	9
13	20	153	148	148
Sum		765	773	789
I.F. = +.10			+ 1	
k(1st sum − 595) = −13				
Σ_8 = sum			761	

V Tab	Arg. at Date		Value
15	17.0	175.1 + .5	7321
16	9.5	6.13	1316
17	31.5	62.4 + 1.1	7469
18	2.5	96.2	255
19	2.5	49.7	276
21	6.5	55	58
22	7.0	22.9	47
Sum			16742
k(Tab.19 − 200)			6
9 (Const.)			9
Σ_8			761
Σ_9			17520
Tab. 24 Arg.			
" " Parallax			55′ 14″

112th Day

V Tab	Arg.	21.0	Date 21.5	22.0
1	61	100	96	94
2	112	30	26	23
3	17	250	246	244
4	0.5	66	66	65
5	16	10	11	12
6	24	15	15	15
7	67	2	2	2
Sum		473	462	455
10	72	116	114	112
11	36	21	21	21
12	31	2	3	4
13	20	166	166	165
Sum		778	766	757
I.F. = +.10			+ 11	
k(1st sum − 595) = 13 (−)				
Σ_8 = sum			754	

V Tab	Arg. at Date		Value
15	14.0	175.1 + .5	2456
16	6.5	6.13	361
17	28.5	62.4 + 1.1	6852
18	9.0	159.2	612
19	15.0	33.7	392
21	3.5	55.2	3
22	4.0	22.9	10
Sum			10686
k(Tab.19 − 200)			21
9 (Const.)			9
Σ_8			754
Σ_9			11470
Tab. 24 Arg.			
" " Parallax			54′ 13″

Flood Dates

C
2414 = Apr. = 2300799 ✓
Fr

6943
2293856.64 244 111
6939.69 341 0
796.33 585 110
15.21
.33
.13
812.00
799
Apr 13.00 = F.M.B.C.T.
Apr 14 = 14 Nisan
∴ Apr 1 = 1 Nisan = (Th)

Nisan 17th

1 Apr 10 (26) 2404 = 3.08 ×
✓ Apr 3 (19) 2398 = 1.12 ×
1 Mar 30 (15) 2384 = 2.82 × = 1 Nis. on Fri.
✓ Apr 8 (24) 2374 = 1.79 ×
Apr 13 (29) 2350 = 2.71

C
2412 = Apr. = 2301530 ✓
Mo

7674
2293856.64 244 111
7677.95 258 8
534.59 502 119
15.59
.32
.13
50.63
30
Apr 20.63 = F.M.B.C.T.
Apr 21 = 14 Nisan
∴ Apr 8 = 1 Nisan = (Su)

C
2410 = Apr. = 2302260 ✓
W

8404
2293856.64 244 111
8416.22 175 17
272.86 419 128
15.42
.30
.13
88.71
60
Apr 28.71 = F.M.B.C.T.
Apr 29 = 14 Nisan
∴ Apr 16 = 1 Nisan = (W)

C
2407 = Apr = 2303356 ✓
Su

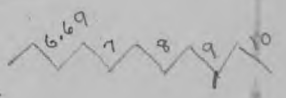
9500
2293856.64 244 111
9508.85 37 13
365.49 281 127
14.80
.31
.13
80.73
56
Apr 24.73 = F.M.B.C.T.
Apr 25 or 26 = 14 Nisan
∴ Apr 12 or 13 = 1 Nisan = W or Th

C
2406 = Apr. = 2303721 ✓
Mo

9865
2293856.64 244 111
9863.22 381 1
719.86 625 112
14.98
.33
.13
35.30
21
Apr 14.30 = F.M.B.C.T.
Apr 15 = 14 Nisan
∴ Apr 2 = 1 Nisan = (Mo)

C
2404 = Apr. = 2304452 — 24
Th
2304428.59 113 88
29.53 29 32
458.12 142 120 — 458.12
15.44 .10
.32 .34
.13 .13
74.01 — 458.69
52 52
Apr 22.01 = F.M.B.C.T. Apr 6.69 = Conj.
Apr 23 = 14 Nisan
∴ Apr 10 = 1 Nisan = (F)

31
2.77
3.08 = T.T. Per.



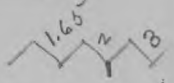
Apr. 22.01
" 6.69
15.32 = W.P.

C
2403 = Apr. = 2304817 — 389
Fr
2304428.59 113 88
383.90 373 20
812.49 486 108

C
2399 = Apr. = 2306278 — 1850
W
2304428.59 113 88
1860.43 207 37
89.02 320 125

C
2398 = Apr. = 2306643 — 2215
Th
2304428.59 113 88
2214.79 151 25
43.38 264 113 — 43.38
14.83 .79
.33 .35
.18 .13
58.67 — 44.65
43 43
Apr 15.67 = F.M.B.C.T. Apr 1.65 = Conj.
Apr 16 = 14 Nisan
∴ Apr 3 = 1 Nisan = (F)

35
77
1.12 = T.P.



Apr 15.67
1.65
14.02 = W.P.

C
2396 = Apr. = 2307374 — 2946
Su
2304428.59 113 88
2953.06 69 34
81.65 182 122

C
2395 = Apr. = 3311
Mo 2307739
2304428.59 113 88
3307.43 13 22
36.02 126 110
15.52
.33
.13
52.00
39
Apr. 13.00 = F.M.B.C.T.
Apr 14.00 = 14 Nisan
∴ Apr 1 = 1 Nisan = Su

C
2391 = Apr. = 4772
Sa 2309200
2304428.59 113 88
4783.96 247 39
12.55 360 127
15.03
.31
.13
28.02
00
Apr 28.02 = F.M.B.C.T.
Apr 29 = 14 Nisan
∴ Apr 16 = 1 Nisan = Sa

C
2390 = Apr. = 5137
Su 2309565
2304428.59 113 88
5138.32 191 27
66.91 304 115
14.81
.32
.13
82.17
65
Apr 17.17 = F.M.B.C.T.
Apr 18 = 14 Nisan
∴ Apr 5 = 1 Nisan = W

C
2388 = Apr. = 5868
W 2310296
2304428.59 113 88
5876.59 108 36
305.18 221 124
14.99
.31
.13
320.61
296
Apr 24.61 = F.M.B.C.T.
Apr 25 = 14 Nisan
∴ Apr 12 = 1 Nisan = Sa

C
2387 = Apr. = 6233
Th 2310661
2304428.59 113 88
6230.95 53 24
659.54 166 112
15.31
.33
.13
75.31
61
Apr 14.31 = F.M.B.C.T.
Apr 15 = 14 Nisan
∴ Apr 2 = 1 Nisan = Th

C
744 (726)

2384 = Apr. = 2311757
Mo
2311013.92 110 100
738.26 317 8

52.18 427 108 52.18
15.47 :28
.33 :35
.13 :13

68.11 752.94
57 26

Apr 11.11 = F.M.B.C.T. Mar 26.94 = Conj.
Apr 12 = 14 Nisan
∴ Mar 30 = 1 Nisan = (F)

Apr. 11.11 (42)
Mar 26.94
15.17 = W.P.

06
76
200
2.82 = Tr. Per.

26.94 27 28 29 30

C
1474

2382 = Apr. = 2312487
W
2311013.92 110 100
1476.53 234 17

90.45 344 117
14.94
.32
.13

105.84
87

Apr. 18.84 = F.M.B.C.T.
Apr 20 = 14 Nisan
∴ Apr 7 = 1 Nisan = Mo

C
2205

2380 = Apr. = 2313218
Sa
2311013.92 110 100
2214.79 151 25

28.71 261 125
14.84
.31
.13

43.99
18

Apr 25.99 = F.M.B.C.T.
Apr 27 = 14 Nisan
∴ Apr 14 = 1 Nisan = Th

C
2570

2379 = Apr. = 2313583
Su
2311013.92 110 100
2569.16 96 14

83.08 206 114
15.08
.33
.13

98.62
83

Apr. 15.62 = F.M.B.C.T.
Apr 16 = 14 Nisan
∴ Apr 3 = 1 Nisan = Mo

C
3666

2376 = Apr. = 2314679
Th
2311013.92 110 100
3661.79 357 10

75.71 467 110
15.60
.33
.13

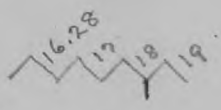
91.77
79

Apr 12.77 = F.M.B.C.T.
Apr 14 = 14 Nisan
∴ Apr 1 = 1 Nisan = W

V
2375 = Apr = 2315044
Fr

4031
2311013.92 110 100
4045.69 330 30
5059.61 440 130 059.61
15.53 .21
.30 .33
.13 .13

72
77
1.00
2.49 = Tr. Per.



Apr. 31.57
" 16.28
15.29 = W.P.

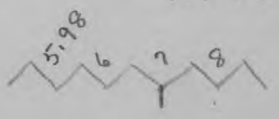
75.57
44
Apr 31.57 = F.M.B.C.T.
May 32 = 14 Nisan
∴ Apr 19 = 1 Nisan = M

60.28
44
Apr 16.28 = Conj.

C
2374 = April = 2315409
9a =
Kis. 22

4396
2311013.92 110 100
4400.06 274 19
413.98 384 119 413.98
15.19 .53
.32 .34
.13 .13

02
77
1.00
1.79 = Tr. Per.



Apr 19 - Apr 8 = 354

Apr 20.62
" 5.98
14.64 = W.P.

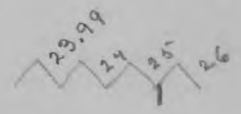
29.62
9
Apr. 20.62 = F.M.B.C.T.
Apr 21 = 14 Nisan
∴ Apr 8 = 1 Nisan = (F)

414.98
09
Apr 5.98 = Conj.

V
2373 - = May = 2315805
Su

4792 (775)
2311013.92 110 100
4783.96 247 39
5797.88 357 139 797.88
15.01 .67
.28 .31
.13 .13

.01
78
1.00
1.79 = Tr. Per.



Apr 8 - Apr 26 = 384

May 8.30
Apr 23.99
14.31 = W.P.

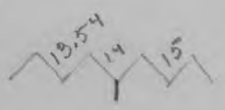
813.30
05
May 8.30 = F.M.B.C.T.
May 9 = 14 Nisan
∴ Apr 26 = 1 Nisan = T

798.99
775
Apr 23.99 = Conj.

C
2372 = Apr = 2316140
Tu

5127
2311013.92 110 100
5138.32 191 27
152.24 301 127 152.24
14.80 .84
.31 .33
.13 .13

46
77
1.23 = Tr. Per.



Apr 26 - Apr 15 = 354

Apr 27.48
" 13.54
13.94 = W.P.

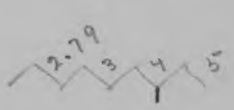
67.48
40
Apr 27.48 = F.M.B.C.T.
Apr 28 = 14 Nisan
∴ Apr 15 = 1 Nisan = M

153.54
140
Apr 13.54 = Conj.

C
2371 = Apr = 2316505
W

5492
2311013.92 110 100
5492.69 135 15
506.61 245 115 506.61
14.89 .71
.32 .34
.13 .13

21
77
1.00
1.98 = Tr. Per.



Apr 15 - Apr 5 = 355

Apr. 16.95
Apr 2.79
14.16 = W.P.

21.95
05
Apr 16.95 = F.M.Bab.C.T.
Apr 18 = 14 Nisan
∴ Apr 5 = 1 Nisan = S

507.79
505
Apr. 2.79 = Conj.

V
2370 = May = 5887
T 2316900
2311013.92 110 100
5876.59 108 36

6890.51 218 136
15.01
.29
.13
905.94
900
May 5.94 = F.M.Bab.C.T.
May 7 = 14 Nisan
∴ Apr 24 = 1 Nisan = (F) (8th month)

6890.51
.56
.32
.13
6891.52
6870.
Apr 21.52 = Conj. Bab. C.T.

48
77
1.00
2.25 = T.P.

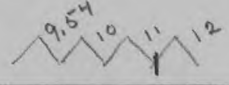
Apr. 5 to Apr 24 = 384
May 5.94
Apr 21.52
14.42 = W.P.

C
2369 = Apr. 6223
F 2317236
2311013.92 110 100
6230.95 53 24.

244.87 163 124
15.33
.31
.13
60.64
36.
Apr. 24.64 = F.M.Bab.C.T.
Apr 25 = 14 Nisan
∴ Apr 12 = 1 Nisan = (T)

244.87
.20
.34
.13
45.54
36
Apr. 9.54

46
77
100
2.23 = Tr. Per.



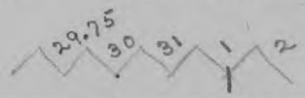
Apr 24 to Apr. 12 = 354
Apr. 24.64
Apr. 9.54
15.10 = W.P.

C
2368 = Apr. 6588 (570)
Su 2317601
2311013.92 110 100
6585.32 397 12

7599.24 507 112
15.58
.33
.13
615.28
601
Apr. 14.28 = F.M.Bab.C.T.
Apr. 15 = 14 Nisan
∴ Apr 2 = (Su)

7599.24
.03
.35
.13
599.75
570
Mar. 29.75 = Conj. Bab. C.T.

.25
76
200
3.01 = Tr. Per.



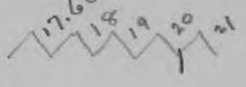
Apr 12 to Apr 2 = 355
Apr. 14.28
Mar. 29.75
15.53 = W.P.

V
2367 = May 6983 (966)
Mo 2317996
2311013.92 110 100
6969.22 370 32

7983.14 480 132
15.61
.30
.13
999.18
996
May 3:18 = F.M.Bab.C.T.
May 4 = 14 Nisan
∴ Apr 21 = 1 Nisan = (S)

983.14
.06
.33
.13
983.66
966
Apr 17.66 = Conj. Bab. C.T.

34
77
200
3.11 = Tr. Per.



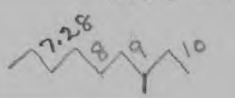
Apr 2 - Apr 21 = 384
May 3.18
Apr 17.66
15.52 = W.P.

C
2366 = Apr. 7318
Tu 2318331
2311013.92 110 100
7923.59 314 20

8337.51 424 120
15.45
.32
.13
53.41
31
Apr 22.41 = F.M.B.C.T.
Apr 23 = 14 Nisan
∴ Apr 10 = 1 Nisan = (W)

337.51
.30
.34
.13
338.28
31
Apr 7.28 = Conj. B.C.T.

.72
77
1.00
2.49 = Tr. Per.



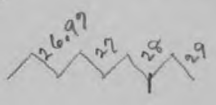
C
2365 – = April =
W

7684 (666)
2318697
2311013.92 110 100
7677.95 258 8
691.87 368 108 691.87
15.08 .62
.33 .35
.13 .13
707.41 692.97
97 666

Apr 10.41 = F.M.B.C.T. Mar 26.97 = Conj.
Apr 11 = 14 Nisan
∴ Mar 29 = 1 Nisan = (Su)

41
Apr. 10.41
Mar 26.97
14.44 = W.P.

03
76
100
1.79 = Tr. Per.



V
2364 = April =
Fr

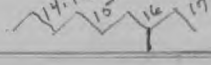
8049 (062)
2319062
2311013.92 110 100
8061.85 231 29
9075.77 341 129 075.77
14.92 .75
.30 .33
.13 .13
91.12 76.98
62 62

Apr 29.12 = F.M.B.C.T. Apr 14.98 = Conj.
Apr 30 = 14 Nisan
∴ Apr 17 = 1 Nisan = (Sa)

Mar 29 – Apr 17 = 384

Apr. 29.12
" 14.98
14.14 = W.P.

02
77
100
1.79 = T.P.



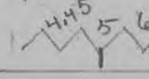
C
2363 = April =
Sa

8414
2319427
2311013.92 110 100
8416.22 175 17
9430.14 285 117 430.14
14.79 .84
.32 .34
.13 .13
445.38 431.45
27 27

Apr 18.38 = F.M.B.C.T. Apr 4.45 = Conj. B.C.T.
Apr 19. = 14 Nisan
∴ Apr 6 = 1 Nisan = (W)

Apr 18.38
" 4.45
13.93 = W.P.

.55
.77
1.32 = Tr. Per.



V
2362 = May =
Su

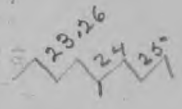
8809 (792)
2319822
2311013.92 110 100
8800.12 148 37
9814.04 258 137 814.04
14.86 .77
.29 .32
.13 .13
829.32 815.26
22 792

May 7.32 = F.M.B.C.T. Apr. 23.26 = Conj.
May 8 = 14 Nisan
∴ Apr 25 = 1 Nisan = (Tu)

Apr 6 to Apr 25 = 384

May 7.32
23.26
14.06 = W.P.

.74
.78
1.52 =
Tr. Per.



C
2361 – =
M

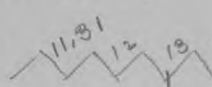
9145
2320158
2311013.92 110 100
9154.48 92 25
168.40 202 125 168.40
15.11 .45
.31 .33
.13 .13
183.95 169.31
158 158

Apr. 25.95 = F.M. Bab. C.T. Apr. 11.31 = Conj. Bab. C.T.
Apr. 27 = 14 Nisan
∴ Apr 14 = 1 Nisan = (Su)

Apr 25 to Apr 14 = 355

Apr. 25.95
Apr. 11.31
14.64 = W.P.

.69
.77
1.00
2.46 = Tr. Per.



C
2360 = April = 23205 23 (9510)
W
23110 13.92 110 100
9508.85 37 13

522.77 147 113

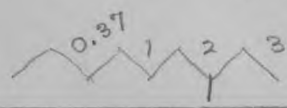
Apr 14 to Apr 3 = 354

Apr. 15.64
0.37
15.27 = W.P. = toward apogee

15.41
.33
.13
38.64
23

522.77
.12
.35
.13
23.37
23

Apr. 15.64 = F.M. Bab. C.T. Apr 0.37 = Conj. B.C.T.
Apr. 16 = 14 Nisan
∴ Apr 3 = 1 Nisan = T



.63
.77
1.
2.40 = Tr. Per.

V
2359 = May = 23209 18 (9905) (888)
T
23110 13.92 110 100
9892.75 10 34

906.67 120 134

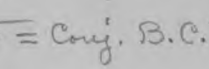
Apr 3 to Apr 22 = 384

May 34.63
19.16
15.47 = W.P.

15.54
.29
.13
922.63
918

906.67
.04
.32
.13
May 907.16
888
Apr. 19.16 = Conj. B.C.T.

May 4.63 = F.M. Bab. C.T.
May 5 = 14 Nisan
∴ Apr 22 = 1 Nisan = W



.84
1.77
2.61 = Tr. P.

C
2358 = April = 10240 (10247.11)
F
23212 53
23110 13.92 110 100
354 22

261.03 464 122

Apr 22 to Apr 12 = 355

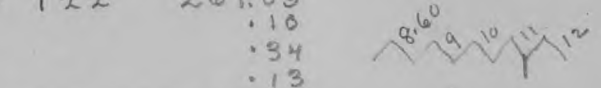
Apr 24.07
" 8.60
15.47 = W.P.

15.59
.32
.13
77.07
53

261.03
.10
.34
.13
261.60
53

Apr 24.07 = F.M.B.C.T.
Apr 25 = 14 Nisan
∴ Apr 12 = 1 Nisan = M

Apr 8.60 = Conj.



40
77
200
3.17 = Tr. Per

C
2357 = April = 34 (588)
Sa
23216 19
23215 85.87 379 78
29.53 29 32

615.40 408 110

Apr 12 to Mar 31 = 354

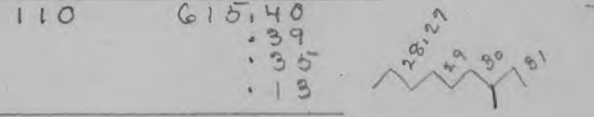
43
Apr 12.22
Mar 28.27
14.95 = W.P.

15.36
.33
.13
31.22
19

615.40
.39
.35
.13
616.27
588

Apr 12.22 = F.M.B.C.T. Mar 28.27 = Conj.
Apr 13 = 14 Nisan
∴ Mar 31 = 1 Nisan = F

2 to this the year?



.73
.76
100
2.49 = Tr. Per.

V
2356 = Apr = 23219 84 (399)
Mo
23215 85.87 379 78
413.43 2 53

999.30 381 131

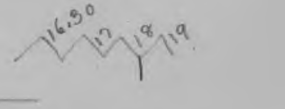
Mar 31 to Apr 19 = 384

Apr 30.90
16.30
14.60 = W.P.

15.17
.30
.13
1014.90
984

999.30
.54
.38
.13
1000.30
984

Apr 30.90 = F.M.B.C.T. Apr 16.30 = Conj.
May 2 = 14 Nisan
∴ Apr 19 = 1 Nisan = T



70
77
100
2.47 = Tr. Per.

Flood Dates

C
2350 = Apr = 2324175
Mo

2590

2321585.87 | 379 | 78
2598.69 | 124 | 46
4184.56 | 503 | 124

15.58
.31
.13

200.58
175

Apr 25.58 = F.M.B.C.T.
Apr 26 = 14 Nisan
∴ Apr 13 = 1 Nisan = (F)

4184.56
.03
.34
.13

85.06
75

Apr 10.06 = Conj.

10.06 11 12 13

94
77
100

2.71 = Tr. Per.

C
2352 = Apr. = 2323445
Sa

1860

2321585.87 | 379 | 78
1860.43 | 207 | 37
3446.30 | 586 | 115

15.20
.32
.13

61.95
45

Apr 16.95 = F.M.B.C.T.
Apr 18 = 14 Nisan
∴ Apr 5 = 1 Nisan = (Tu)

2350
2374
2384
2398
2404
} 1 Nis = F

54 years

C
2355 = Apr = 2322349
Tu

764

2321585.87 | 379 | 78
767.80 | 346 | 41
2353.67 | 725 | 119

14.86
.32
.13

68.98
49

Apr 19.98 = F.M.B.C.T.
Apr 21 = 14 Nisan
∴ Apr 8 = 1 Nisan = (Mo)

Flood Dates

17 Nisan
1

Apr 15	(31)	2475	=	2.88	355
Apr 4	(20)	2455	=	2.77	354
✓ Mar 31	(16)	2452	=	1.49	* 354
Apr 16	(32)	2448	=	2.75	355
↓ Apr 5	(21)	2428	=	2.45	* 354
		2772	=		

= + Nis. on Fri

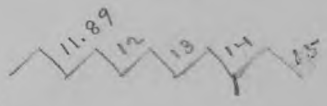
F or S

C
2475 = Apr. = 2278519 ✓
Sa
22727 12.74 105 156
5817.53 51 371
8530.27 156 527
15.37
.31
.13
46.08
19
Apr 27.08 = F.M.B.C.T.
Apr 28 = 14 Nisan
∴ Apr 15 = 1 Nisan = (F)

2476
Apr 25 − Apr 15 = 355

30.27
.16
.33
.13
30.89
19
Apr 11.89 = Conj.

11
77
200
2.88 = Tr. Pul.



C
2474 = Apr. = 2278884 ✓
Sa
22727 12.74 105 156
6171.89 395 359
884.63 500 515
15.59
.33
.13
900.68
84
Apr 16.68 = F.M.B.C.T.
Apr 17 = 14 Nisan
∴ Apr 4 = 1 Nisan = Tu

Apr 15 − Apr 4 = 354

C
2472 = Apr. = 2279615 ✓
W
22727 12.74 105 156
6910.16 312 367
22.90 417 523
15.41
.28
.13
38.72
15
Apr 23.72 = F.M.B.C.T.
Apr 24 = 14 Nisan
∴ Apr 11 = 1 Nisan = (F) or (Sa)

C
2471 = Apr = 2279980 ✓
Th
22727 12.74 105 156
7264.52 257 355
77.26 362 511
15.04
.33
.13
92.76
80
Apr 12.76 = F.M.B.C.T.
Apr 14 = 14 Nisan
∴ Apr 1 = 1 Nisan = W

Apr 11 − Apr 1 = 355

C
2423 = Apr. = 2297512 ✓
Mo

3656
2293856.64 244 111
3661.79 357 10
518.43 601 121
15.11
.32
.13
33.99
12
Apr 21.99 = F.M.B.C.T.
Apr 23 = 14 Nisan
∴ Apr 10 = 1 Nisan = (Tu)

C
2422 = Apr = 2297877 ✓
Tu

4021
2293856.64 244 111
4016.16 301 398
872.80 545 509
15.43
.33
.13
88.69
77
Apr 11.69 = F.M.B.C.T.
Apr 12 = 14 Nisan
∴ Mar 30 = 1 Nisan — (Sa)

C
2420 = Apr = 2298608 ✓
Fr

4752
2293856.64 244 111
4754.42 218 7
611.06 462 118
15.59
.32
.13
27.10
08
Apr 19.10 = F.M.B.C.T.
Apr 20 = 14 Nisan
∴ Apr 7 = 1 Nisan = (W)

C
2418 = Apr = 2299338 ✓
Su

5482
2293856.64 244 111
5492.69 135 15
349.33 379 126
15.15
.31
.13
64.92
38
Apr 26.92 = F.M.B.C.T.
Apr 28 = 14 Nisan
∴ Apr 15 = 1 Nisan = (Sa)

C
2415 = Apr = 2300434 ✓
Th

6578
2293856.64 244 111
6585.32 397 12
441.96 641 123
14.91
.31
.13
57.31
34
Apr 23.31 = F.M.B.C.T.
Apr 24 = 14 Nisan
∴ Apr 11 = 1 Nisan = (9a)

2

C
2467 = Apr = 2281441 ✓
Tu

8729
2272712.74 105 156
8741.05 91 372
453.79 196 528
15.14
.30
.13
69.36
41
Apr 28.36 = F.M.B.C.T.
Apr 29 = 14 Nisan
∴ Apr 16 = 1 Nisan = (Tu)

C
2466 = Apr. = 2281806 ✓
W

9094
2272712.74 105 156
9095.42 35 360
808.16 140 516
15.45
.32
.13
24.06
06
Apr 18.06 = F.M.B.C.T.
Apr 19 = 14 Nisan
∴ Apr 6 = 1 Nisan = (Su)

Apr 16 - Apr 6 = 355

C
2464 = Apr = 2282537 ✓
Sa

9825
2272712.74 105 156
9833.69 352 369
546.43 457 525
15.58
.31
.13
62.45
37
Apr 25.45 = F.M.B.C.T.
Apr 26 = 14 Nisan
∴ Apr 13 = 1 Nisan = (W)

C
2468 = Apr = 2282902 ✓
Su

10190
2272712.74 105 156
10188.05 296 357
900.79 401 513
15.31
.33
.13
16.56
02
Apr 14.56 = F.M.B.C.T.
Apr 15 = 14 Nisan
∴ Apr 2 = 1 Nisan = (Su)

Apr 13 - Apr 2 = 354

C
2460 = Apr. = 2283998 ✓
Th

714
2283284.69 374 134
708.73 288 376
3993.42 662 510
14.83
.33
.13
4008.71
3998
Apr 10.71 = F.M.B.C.T.
Apr 11 = 14 Nisan
∴ Mar 29 = 1 Nisan = (Su)

C
2436 = Apr. = 2292764 ✓
Sa

9480

2283284.69 374 134
9479.32 8 381

764.01 382 515

15.17
.32
.13

79.63
64

Apr 15.63 = F.M.
Apr 16 = 14 Nisan
∴ Apr 3 = 1 Nisan = Su

C
2434 = Apr. = 2293494 ✓
Mo

10210

2283284.69 374 134
10217.58 325 389

502.27 699 523

14.80
.31
.13

517.51
494

Apr 23.51 = F.M.
Apr 24 = 14 Nisan
∴ Apr 11 = 1 Nisan = W

C
2431 = Apr. = 2294590 ✓
Fr

734

2293856.64 244 111
738.26 317 8

594.90 561 119

15.34
.32
.13

610.69
590

Apr 20.69 = F.M.
Apr 21 = 14 Nisan
∴ Apr 8 = 1 Nisan = Th

C
2428 = Apr. = 2295686 ✓
Tu

1830

2293856.64 244 111
1830.90 178 5

687.54 422 116

15.44
.32
.13

703.43
686

Apr 17.43 = F.M.
Apr 18 = 14 Nisan
∴ Apr 5 = 1 Nisan = F

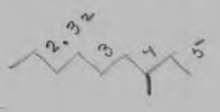
2429
Apr 16 − Apr 5 = 354

68
77
100
245 = Tr. Per.

87.54
.31
.34
.18

88.32
86

Apr 2.32 = Conj.



C
2426 = Apr. = 2296416 ✓
Th

2560

2293856.64 244 111
2569.16 96 14

425.80 340 125

14.92
.31
.13

41.16
16

Apr 25.16 = F.M.
Apr 26 = 14 Nisan
∴ Apr 13 = 1 Nisan = Mo

C
2458 = Apr. = 2284728 ✓
Sa

1444

2283284.69	374	134
1447.00	206	385
4731.69	580	519
15.23		
.32		
.13		
47.37		
28		

Apr 19.37 = F.M.B.C.T.
Apr 20 = 14 Nisan
∴ Apr 7 = 1 Nisan = (Th)

C
2456 = Apr = 2285459 ✓
Tu

2175

2283284.69	374	134
2185.26	123	393
5469.95	497	527
15.60		
.31		
.13		
85.99		
59		

Apr 26.99 = F.M.B.C.T.
Apr 28 = 14 Nisan
∴ Apr 15 = 1 Nisan = (Mo)

C
2455 = Apr. = 2285824 ✓
We

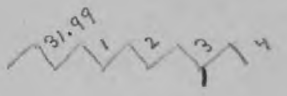
2540

2283284.69	374	134	
2539.63	67	381	
824.32	441	515	824.32
15.53			.20
.32			.34
.13			.13
40.30			24.99
24			24

Apr 16.30 = F.M.B.C.T. Mar 31.99 = Conj.
Apr 17 = 14 Nisan
∴ Apr 4 = 1 Nisan = (F)

Apr 15 to Apr 4 = 354

1
76
2.00
2.77 = Tr. Per.



C
2452 = Apr. = 2286920 ✓
Su

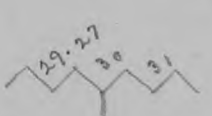
3636 (889)

2283284.69	374	134	
3632.26	328	378	
916.95	702	512	916.95
14.80			.84
.33			.35
.13			.13
32.21			918.27
20			889

Apr 12.21 = F.M.B.C.T. Mar 29.27 = Conj.
Apr 13 = 14 Nisan
∴ Mar 31 = 1 Nisan = (F)

Apr 11 - Mar 31 = 354

73
76
1.49 = Tr. Per.



C
2450 = Apr. = 2287650 ✓
Tu

4366

2283284.69	374	134
4370.53	245	386
55.22	619	520
15.01		
.32		
.13		
70.68		
50		

Apr 20.68 = F.M.B.C.T.
Apr 21 = 14 Nisan
∴ Apr 8 = 1 Nisan = (Mo)

Apr 19 - Apr 8 = 354

(over)

98
77
100
2.75 = Tr. Per.

C
2448 = Apr. = 2288381 ✓
Fr

5097

2283284.69 374 134
5108.79 163 395
393.48 537 529

393.48
.08
.33
.13
94.02
81
Apr 13.02 = Conj.

Apr 26 - Apr 16 = 355

393.48
15.46
.30
.13
409.37
381
Apr 28.37 = F.M.B.C.T.
Apr 29 = 14 Nisan
∴ Apr 16 = 1 Nisan = F

C
2447 = Apr. = 2288746 ✓
Sa

5462

2283284.69 374 134
5463.16 107 383
747.85 481 517

15.61
.32
.13
63.91
46
Apr 17.91 = F.M.B.C.T.
Apr 19 = 14 Nisan
∴ Apr 6 = 1 Nisan = W

C
2444 = Apr. = 2289842 ✓
W

6558

2283284.69 374 134
6555.79 368 379
840.48 742 513

14.93
.33
.13
55.87
42
Apr 13.87 = F.M.B.C.T.
Apr 15 = 14 Nisan
∴ Apr 2 = 1 Nisan = W

C
2442 = Apr. = 2290572 ✓
Fr

7288

2283284.69 374 134
7294.06 285 388
578.75 659 522

14.84
.32
.13
94.04
78
Apr 16.04 = F.M.B.C.T.
Apr 17 = 14 Nisan
∴ Apr 4 = 1 Nisan = Su

C
2439 = Apr. = 2291668 ✓
Tu

8384

2283284.69 374 134
8386.69 147 384
671.38 521 518

15.54
.32
.13
87.37
68
Apr 19.37 = F.M.B.C.T.
Apr 20 = 14 Nisan
∴ Apr 7 = 1 Nisan = Su

V
2454 = May 0 = 2935
Th 2286219
2283284.69 374 134
2923.53 40 02
208.22 414 136
15.39
.29
.13
224.03
19
May 5.03 = F.M.β.C.T.
May 6 = 14 Nisan
∴ Apr 23 = 1 Nisan =

2455
Apr 4 – Apr 23 = 384

C
2453 – = April 0 = 3271
F 2286555
2283284.69 374 134
3277.90 384 390
562.59 758 524
15.08
.31
.13
78.11
55
Apr 23.11 = F.M.β.C.T.
Apr 24 = 14 Nisan
∴ Apr 11 = 1 Nisan =

Apr 23 – Apr 11 = 354

V
2451 = May 0 = 4031
M 2287315
2283284.69 374 134
4016.16 301 398
300.85 675 532
14.80
.30
.13
16.08
15
May 1.08 = F.M.β.C.T.
May 2 = 14 Nisan
∴ Apr 19 = 1 Nisan =

2452
Mar 31 – Apr 19 = 384

V
2449 – = May 0 = 4762
W 2288046
2283284.69 374 134
4754.42 218 7
8039.11 592 141
15.17
.28
.13
54.69
46
May 8.69 = F.M.β.C.T.
May 9 = 14 Nisan
∴ Apr 26 = 1 Nisan =

2450
Apr 8 – Apr 26 = 384

C
2429 – = April 0 = 1465
Su 2295321
2293856.64 244 111
1476.53 234 17
333.17 478 128
15.61
.30
.13
49.21
21
Apr 28.21 = F.M.β.C.T.
Apr 29 = 14 Nisan
∴ Apr 16 = 1 Nisan =

V
2476 = May 0 =
F

2772
2718 4
2772 712.74 105 156
5463.16 107 383
175.90 212 539
15.05
.28
.13
191.36
84

May 7.36 = F.M.β.C.T.
May 8 = 14 Nisan
∴ Apr 25 = 1 Nisan

V
2462
M

V
2465
Th

C
2461—
Tu

THE FLOOD CALENDAR

(Calculation of Moses)

Noah enters ark in Full Moon

YEAR 600

LUNAR YEAR (a)		SOLAR YEAR (b)		PERIODS (40 + 150) days + 25 weeks (c)	
(1) Tishri	Rosh Hashana	30			
(2) Hesvan		29 { 16 / 13	17th Rain	40 days rain	
(3) Kisleu		30 { 27 / 3	"But upon the eighth day, dark clouds overspread the heavens... Soon large drops of rain began to fall."		I
(4) Tebet		29			
(5) Shebat		30		150 days = 5 lunar months + 3 days (28 Kisleu – 29 Iyar inclusive)	
(6) Adar		29			
(7) Nisan	Rosh Hodesh	30 { 16 / 1 / 13	17th Ark rests		
(8) Iyar		29		190th day = end of 27 weeks + 1 day	
(9) Sivan		30		30 days	10 weeks
(10) Tammuz		29 { 1 / 28	Tops of mountains seen	40 days	
(11) Ab		30 { 10 / 1 / 11 / 18 / 19	11th Raven 18th Dove 1 25th Dove 2	40th day 7th day 7th "	II 3 weeks ending on 2nd Elul
(12) Elul		29 { 1 / 1 / 27	2nd Dove 3	7th "	
354 Days					
(1) Tishri	Rosh Hashana (Civil New Year)	30 { 1 / 29	601st year	28 days = 4 weeks (3 Elul – 1 Tishri inc.)	
(2) Hesvan		27	Noah leaves ark in seed-time and 175th day of II	56 " = 8 weeks (2 Tishri – 27 Hesvan inc.) New Moon	
		365 Days		365 Days	

7. −2348, Apr 18, Bab. Tr. Per. = 2.71d

$\omega = 23^\circ\ 54'$ $\lambda = 7.^\circ5$ $(7^\circ\ 30')$ $\beta = +0.^\circ8$ $(+0^\circ\ 48')$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$

1. $\log \sin\omega = 9.6076068$ $\log\cos\omega = 9.9610668$
$\log\sin\lambda = 9.1156977$ $\log\sin\beta = 8.1449532$
$\log\cos\beta = 9.9999577$ 8.1060200
8.7232622 $.0127649$ (or 50)
$.0528764$
$.0127649$
$\sin\delta = .0656413$ $= \sin \log\ 8.8171772 =$
$\delta = 3^\circ\ 45'\ 49''$

8. −2447, Apr 16, Bab. Tr. Per. = 2.75d

$\omega = 23^\circ\ 54'$ $\lambda = 14.^\circ8$ $(14^\circ\ 48')$ $\beta = -5.^\circ5$ $(-5^\circ\ 30')$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$

1. $\log \sin\omega = 9.6076068$ $\log\cos\omega = 9.9610668$
$\log\sin\lambda = 9.4072987$ $\log\sin\beta = 8.9815729$ n
$\log\cos\beta = 9.9979960$ 8.9426397
9.0129015 $-.0876274$
$.1030152$
$-.0876274$
$\sin\delta = .0153878$ $= \log\sin\ 8.1871766 =$
$\delta = 0^\circ\ 52'\ 54''$

9. −2454, Apr 4, Bab. Tr. Per. = 2.77d

$\omega = 23^\circ\ 54'$ $\lambda = 3.^\circ3$ $(3^\circ\ 18')$ $\beta = +3.^\circ6$ $(+3^\circ\ 36')$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$

1. $\log \sin\omega = 9.6076068$ $\log\cos\omega = 9.9610668$
$\log\sin\lambda = 8.7601512$ $\log\sin\beta = 8.7978941$
$\log\cos\beta = 9.9991422$ 8.7589609
8.3669002 $.0574065$
$.0232756$
$.0574065$ log sin
$\sin\delta = .0806821$ $= 8.9067772 =$
$\delta = 4^\circ\ 37'\ 40''$

10. −2474, Apr 15, Bab. Tr. Per. = 2.88

$\omega = 23^\circ\ 54'$ $\lambda = 9.1$ $(9^\circ\ 6')$ $\beta = +4.6$ $(+4^\circ\ 36')$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$

1. $\log \sin\omega = 9.6076068$ $\log \cos\omega = 9.9610668$
$\log \sin\lambda = 9.1990913$ $\log \sin\beta = 8.9041685$
$\log \cos\beta = 9.9985988$ 8.8652353
8.8052969 $.0733222$
$.0638700$
$.0733222$

$\sin\delta = .1371922 = \log \sin 9.1373295 =$
$\delta = 7^\circ\ 53'\ 7''$

7. −2349, Apr 13, 6:00 p.m. Tr. Per. = 2.71 Bab.
(−2356 + 7)

Cycle	L	I	N	θ
−2356	229.5	17	26.3	220.7
Yr. 7	19.9	125	75.2	135.4
Apr 0	105.9	299	27.2	4.8
Day 13	171.3	147	2.0	0.7
Hr	9.9	8		
Tab. B, Arg. I	0.2	236	130.7	1.6
	L 355.7	g 126	355.7	7.5 λ
Tab. C, L′, Arg. g	11.2	II 2	g 126	9 u
" " " "	II 0.6			2 II
	λ 7.5	Tab C, Arg u =	+ 0.7°	7 u − II
		" " " u − II =	0.1	
			β + 0.8°	

8. −2447, Apr. 16, 6:00 p.m. Tr. Per. = 2.75 Bab.
(−2480 + 33)

Cycle	L	I	N	θ
−2480	337.6	120	32.9	342.2
Yr. 33	55.1	318	97.1	278.3
Apr 0	105.9	299	27.2	4.8
Day 16	210.8	181	1.7	0.8
Hr	9.9	8		
Tab. β Arg I	.2	206	158.9	266.1
	L 359.5	g 158	L 359.5	14.8 λ
Tab C, L′, Arg. g	8.5	II 4	g 158	281 u
" " " "	II 6.8			4 II
	λ 14.8	Tab. C, Arg u =	− 5.2	277 u − II
		" " " u − II =	− .3	
		β =	− 5.5	

9. −2454, Apr 4, Bab. Tr. Per. = 2.77
(−2480 + 26)

Cycle	L	I	N	θ
−2480	337.6	120	32.9	342.2
Yr. 26	203.0	182	22.0	142.9
Apr 0	105.9	299	27.2	4.8
Day 4	52.7	45	3.0	0.2
Hr.	9.9	8		
Tab. β, Arg. I	0.7	334	85.1	130.1
	L 349.8	g 75	L 349.8	3.3 λ
Tab. C, L′, Arg. g	12.4	II 49	g 75	133 u
" " " "	II 1.1			49
	λ 3.3	Tab. C, Arg. u =	+ 3.6	84 u − II
		" " " u − II =	0.0	
		β =	+ 3.6	

10. −2474, Apr 15, 6:00 pm. Tr. Per. = 2.88 | Bab. C.T.
(−2480 + 6)

Cycle	L	II	N	Φ
−2480	337.6	120	32.9	342.2
Yr. 6	69.5	314	115.9	116.0
Cbr 0	105.9	299	27.2	4.8
Day 15	197.6	170	1.8	0.8
Hr	9.9	8		
Tab. B, Arg. I	1.0	191	177.8	103.8
	L 1.5	g 179	L 1.5	9.1 λ
Tab. C, L', Arg. g	6.4	II 70	g 179	113 u
" " " " II	1.2			70 II
	λ 9.1	Tab. C, Arg. u	= + 4.6	43 u − II
		" " " u − II	= 0.0	
			β = + 4°.6	

1. −2397, Apr. 8, Bab. Tr. Per. = 1.12.

$\omega = 23^\circ\ 54'$ $\quad \lambda = 327.3\ (32^\circ\ 42')$ $\quad \beta = +4.5 = 4^\circ\ 30'$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$
2. $\cos\delta \sin\alpha = \cos\omega \sin\lambda \cos\beta - \sin\omega \sin\beta$
3. $\cos\delta \cos\alpha = \cos\beta \cos\lambda$

1. $\log \sin\omega = 9.6076068$ $\quad \log\cos\omega = 9.96610668$
$\log \sin\lambda = 9.7925870_n$ $\quad \log\sin\beta = \underline{8.8954451}$
$\log\cos\beta = \underline{9.9986542}$ $\quad 8.8565119$
9.3388480_n $\quad .0718641$
sub. $-.2181966$
$\underline{.0718641}$
$\sin\delta = -.1463325 = \log\sin 9.1653408_n =$
$-8^\circ\ 24'\ 52'' =$ (−12.9 in table on 4.5 p. 11)
-8.4

3. −2451, Mar. 31, Bab. Tr. Per. = 1.49.

$\omega = 23^\circ\ 54'$ $\quad \lambda = 346.4 = (13^\circ\ 36'_\eta)$ $\quad \beta = -0.6 = -0^\circ\ 36'$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$

1. $\log \sin\omega = 9.6076068$ $\quad \log\cos\omega = 9.96610668$
$\log \sin\lambda = 9.3713304_\eta$ $\quad \log\sin\beta = \underline{8.0200207}_\eta$ ✓
$\log\cos\beta = \underline{9.9999762}$ ✓ $\quad 7.9810875_\eta$
8.9789134_η $\quad -.0095739$
95261 $\quad -.0952606$
$\underline{-.0095739}$
$\sin\delta = -.1048345 = \log\sin 9.0205042_\eta =$
$-6^\circ\ 1'\ 03'' =$ $\quad -5.1$ $\quad -0.6$ ✓ $\quad -5.7$

$-5.0 \quad -5.4$
$\frac{0.6}{5} = .12 \quad \frac{.4}{.12} \quad .048 \quad = -5.1$

2. −2373, Apr. 8, Bab. Tr. Per. = 1.79.

$\omega = 23^\circ\ 54'$ $\quad \lambda = 354.5$ $(5^\circ\ 30'_\eta)$ $\quad \beta = -5.34 = -5^\circ\ 20'\ 24''$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$

1. $\log \sin\omega = 9.6076068$ $\quad \log\cos\omega = 9.96610668$
$\log \sin\lambda = 8.9815729_\eta$ $\quad \log\sin\beta = \underline{8.9687897}_\eta$
$\log\cos\beta = \underline{9.9981110}$ $\quad 8.9298565$
8.5872907_η $\quad -.0850857$
$-.0386625$
$\underline{-.0850857}$
$\sin\delta = -.1237482 = \log\sin = 9.0925389_\eta =$
$-7^\circ\ 6'\ 31''$ ✓

$\frac{.3}{.9}$ $\quad \frac{4.5}{5} = .9$
$.27$

1. Moon's λ and β for -2397, Apr. 3, 6:00 p.m. Bab. Tr. P. = 1.12
($-2397 = -2400 + 3$) Proposed flood epoch.

Cycle	L	I	N	θ	
−2400	151.7	310	17.0	89.7	
Year 3	28.1	152	238.0	58.0	
Apr. 0	105.9	299	27.2	4.8	
Day 3	39.5	34	3.1	0.2	
Table B, Arg. I	1.7	25	285.3	152.7	add
	L 326.9	g 252	L 326.9	327.3 λ	
Tab. C, L', Arg. g	.4	II 277	g 252	120 $u = \lambda + \theta$	add u to 360
Arg. II	.0			277 II	
	λ 327.3°			203 = u − II	

Tab. C Arg. u = +4.3
For β Arg u − II .2
β = +4.5°

2. Moon's λ and β for -2373, Apr. 8, 6:00 p.m. Bab. Tr. P. = 1.79.
($-2373 = -2400 + 27$) Proposed flood epoch.

Cycle	L	I	N	θ	
−2400	151.7	310	17.0	89.7	
Yr. 27	332.4	352	341.3	162.2	
April 0	105.9	299	27.2	4.8	
Day 8	105.4	91	2.6	0.4	
Hour 6 p.m.	9.9	8			
Tab. B, Arg. I	0.8	340	28.1	257.1	add
	L 346.1	g 14	L 346.1	354.5 λ	
Tab. C, L', Arg. g	7.9	II 354	g 14.2	252 u	
Arg II	0.5			354 II	
	λ 354.5°			258 = u − II	

Tab. C, Arg. u = −5.04°
" " " u − II = − .3
β = −5.34°

3. Moon's λ and β for -2451, Mar. 31, 6:00 p.m. Bab. Tr. P. = 1.49
($-2451 = -2480 + 29$) Proposed flood epoch.

Cycle	L	I	N	θ	
−2480	337.6	120	32.9	342.2	
Yr. 29	244.4	344	259.9	200.9	
March 0	57.4	308	30.6	3.1	
Day 31	48.5	351	0.0	1.6	
Hour 6 p.m.	9.9	8			
Tab β Arg I	2.1	51	323.4	187.8	add
	L 339.9	g 303	L 339.9	346.4 λ	
Tab. C, L', Arg. g	0.9	II 354 (I+g)	g 303.3 (L+N)	174.2 u (L+θ)	
" " Arg II	5.6			354 II	
	λ 346.4			180 u − II	

Tab C, Arg u = −0.52
" " II = − .1
β = −0.6

4. −2384, Mar. 30, Bab. Tr. Per. = 2.84

$\omega = 23^\circ\ 54'$ $\lambda = 359.5^\circ$ $(-0^\circ\ 30')$ $\beta = +4^\circ\ 24' = 4.6^\circ$

1. $\sin\delta = \sin\omega \sin\lambda \cos\beta + \cos\omega \sin\beta$

1. $\log \sin \omega = 9.6076068$	$\log \cos \omega = 9.9610668$
$\log \sin \lambda = 7.9408419\ \eta$	$\log \sin \beta = 8.8849031$
$\log \cos \beta = 9.9987181$	8.8459699
$7.5471668\ \eta$	$.0701407$
$-\ .0035251$	
$.0701407$	
$\sin\delta = .0666156 = \log \sin 8.8235760 =$	
$\delta = +3^\circ\ 49'\ 10''$ ✓	

5. −2403, Apr. 10, Bab. Tr. Per. = 3.08

$\omega = 23^\circ\ 54'$ $\lambda = 7^\circ$ $\beta = +3^\circ\ 30' = 3.5^\circ$

1. $\log \sin \omega = 9.6076068$	$\log \cos \omega = 9.9610668$
$\log \sin \lambda = 9.0858945$	$\log \sin \beta = 8.7856753$
$\log \cos \beta = 9.9991892$	8.7467421
8.6926905	$.0558139$
$.0492823$	
$.0558139$	
$\sin\delta = .1050962 = \log \sin 9.0215870 =$	
$\delta = +6^\circ\ 1'\ 58''$ ✓	

6. −2428, Apr. 5, Bab. Tr. Per. = 2.45 17 Nisan = Apr 21

$\omega = 23^\circ\ 54'$ $\lambda\ 306.7$ $(-53^\circ\ 18')$ $\beta = -1^\circ\ 36' = (-1.6^\circ)$

1. $\log \sin \omega = 9.6076068$	$\log \cos \omega = 9.9610668$
$\log \sin \lambda = 9.9040529\ \eta$	$\log \sin \beta = 8.4459409\ \eta$
$\log \cos \beta = 9.9998306$	$8.4070077\ \eta$
$9.5114903\ \eta$	$-\ .0255275$
$-\ .3247059$	
$-\ .0255275$	
$\sin\delta = -.3502334 = \log \sin 9.5443575 =$	
$\delta = -20^\circ\ 30'\ 6''$ ✓	

Possible

4. Moon's λ and β for −2383, Mar. 30, 6:00 p.m. Bab. T.P. = 2.84
(−2400 + 17)

Cycle	L	I	N	ϑ	
−2400	151.7	310	17.0	89.7	
Yr 17	92.2	64	28.2	328.8	
Mar 0	57.4	308	30.6	3.1	
Day 30	35.3	340	0.1	1.6	
Hr. 6:00 p.m.	9.9	8			
Tab. B, Arg. I	.3				
	L 346.8	310	75.9	63.2	add
Tab. C, L', Arg. g	12.	g 63	L 346.8	359.5	λ
Arg II	.7	II 13	g 63	63	u
	λ 359.5			13	II
				50	u − II

Tab. C, Arg u = +4.4
" " " u − II 0.0
β = +4.4

5. Moon's λ and β for −2403, Apr. 10, 6:00 p.m. Bab. T.P. = 3.08
(−2444 + 41)

Cyle	L	I	N ϖ	ϑ Node	
−2444	74.0	242	7.7	318.6	
Yr 41	36.5	265	131.6	73.0	
Apr. 0	105.9	299	27.2	4.8	
Day 10	131.8	113	2.3	0.5	
Hr. 6:00 p.m.	9.9	8			
Tab. B. Arg. I	.7	207	168.8	36.9	
	L 358.8	g 168	L 358.8	7.	λ
Tab. C, L', Arg. g	7.5	II 15	g 168	44	u
" " " II	.7			15	II
	λ 7			29	u − II

Tab. C. Arg u = +3.4
" " " u − II = +0.1
β = +3.5

6. Moon's λ and β for −2427, Apr. 5, 6:00 p.m. Bab. T.P. = 2.45
(−2444 + 17)

Cycle	L	I	N ϖ	ϑ	
−2444	74.0	242	7.7	318.6	
Yr. 17	36.5	265	131.6	73.0	
Apr. 0	105.9	299	27.2	4.8	
Day 5	65.9	57	2.9	0.3	
Hr. 6:00 p.m.	9.9	8			
Tab. B, Arg I	1.8	151	169.4	36.7	
	L 294.0	g 103	L 294	306.7	λ
Tab. C, L' Arg. g	12.3	II 254	g 103	343	u
" " " " II	.4			254	II
	λ 306.7			89	u − II

Tab. C, L', Arg. u = −1.6
" " " " u − II = 0.0
β = −1.6

"And after all, the coming of the flood was the starting of the new year, regardless of the moon count." Winlock, 454.

"Kuenen, Schrader and others maintain that the account of the flood was first brought from Assyria or Babylonia in the seventh or eighth century before Christ. But, as Dillman urges, why should the Jews have accepted this foreign story, so variant in many particulars from their own style of thought, and enshrined it in the place which it occupies in their sacred traditions and the line of their ancestry, if it was altogether unknown to them before? And why, he asks, should it be imagined that the story of the flood never spread to surrounding nations until so late a period as this? And if to other nations, why not to Israel?" — William Henry Green, "The Unity of the Book of Genesis," p. 123. New York, 1895.

"The divergences [between Babylonian and Hebrew account of the flood] are so numerous and so serious as it makes it evident that neither has been copied from the other." — W. H. Green, p. 122.

"The suggestion of Friedrich Delitzsch and of Haupt, that the story was first adopted by the Jews at the time of the Babylonish captivity, is very justly repelled by Schrader and Dillman on two distinct grounds. 1. 'It is utterly insupposable that the Jews should have appropriated from their foes, the Babylonians, a local tradition altogether foreign to themselves originally, and saturated by the most silly polytheism.'" — W. H. Green, p. 122.

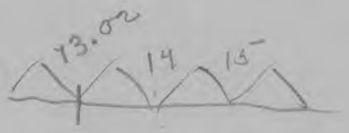
"Perfect harmony" in flood reckoning — W. H. Green, p. 92.

"By their own concession [critics] J is not complete. His genealogy from Adam to Noah is only preserved in part. His account of building the ark and of Noah's leaving it have been omitted, R not judging it necessary to repeat from J what he had already inserted from P." — W. H. Green, 93

"The statement is not that the flood continued to increase for one hundred and fifty days, but that, having previously reached its full height, it continued at its maximum until that time, reckoned from its beginning, and then decreased for seven months and ten days, when the earth was dry." — W. H. Green, p. 93.

"An obvious solution of the whole matter, and one against which no serious objection can be urged, is that Abraham brought with him to Canaan substantially that conception of primeval history which subsequently formed part of the faith of his descendants. There is not the slightest reason for the assumption that this was a post-Mosaic addition to Israel's creed." — W. H. Green, p. 124.

Critics eager to discover a numerical correspondence in the flood record, and this influenced LXX to change 17th to 27th in VII. 11, thereby making flood to continue exactly a year — W. H. Green, p. 122.

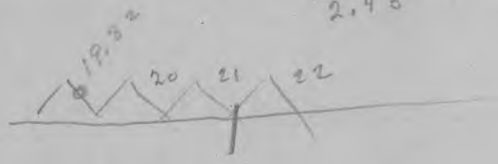


now 14 = Ap 1
15 = 2
16 = 3
17 = 4
18 = 5

12.43
59
13.02

34
May 4.84
Apr 19.32
15.02

68
25
100
2.48



mont, Jost, and Mommsen are based upon the ancient method of computating the reigns of the Roman emperors. Certain coins issued in the fourth consulate of Nero (60 A.D.) read Tribun. Potest. VII.[85] If 60 A.D. was the 7th year of Nero, then his 12th year must have been in 65 A.D. Josephus twice states that the Jewish Revolt broke out in Nero's 12th year,[86] and he gives the date as 17 Artemisius, the Syro-Macedonian name for the Jewish spring month Iyar.[87]

Cestius was fighting with the heavy 12th legion, which necessitated a periodic retirement from battle. Commonly, the "rests" took place at week ends, when the Jews were not supposed to fight. But at the very outbreak of this war with Rome, the seditious Jews fought on their Sabbath day (II.17.10). When Cestius finally reached Lydda, "he found the city empty of its men, for the whole multitude were gone up to Jerusalem to the feast of tabernacles" (II.19.1). This is what followed:

"But as for the Jews, when they saw the war approaching to their metropolis, they left the feast, and betook themselves to their arms; and taking courage greatly from their multitude, went in a sudden and disorderly manner to the fight, with a great noise, and without any consideration had of the rest of the seventh day, although the Sabbath was the day to which they had the greatest regard; but that rage which made them forget the religious observation (of the Sabbath) made them too hard for their enemies in the fight."[88]

Thus, according to Josephus, the feast of tabernacles coincided with the Jewish Sabbath ~~in the 12th year of Nero, which was~~ the year 65 A.D. From lunar Table II, the calendar data for the year 65 A.D. are as follows:

1 Nisan = Thursday; therefore 15 Tisri = Saturday.
(For this reckoning, cf. Table V.)

This synchronal dating could apply either to the first or eighth day of Tabernacles; ~~Tisri~~; but it is probable, as Josephus suggests, and as Cestius also discovered, that the Jews went up early to the feast to arouse their brethren on account of the approaching Roman army, and that they left on the first Sabbath to attack Cestius at Bethhoron, about eight miles ~~to the~~ northwest of

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85 Eckhel, "Doctrina Numorum," VI, p. 264; Cohen, XXXII-XXXIX; Mommsen, "Staatsrecht," recht," pp. 752-754.
86 Josephus, "Wars," II.19.9; II.14.4. Whiston. Cincinnati, 1844.
87
88 Josephus, "Wars," II.19.2. [Italics mine.]

Jerusalem.

3. The Year in John 5.--By the same method of reckoning as the foregoing, the feast ~~date~~ year in John 5 can be computed. The Sabbath healing of the impotent man on a Jewish feast represents the basis of the calendar problem. The solution is simple. If the incident occurred on a 14-Nisan Sabbath, day, then 1 Nisan would be Sunday (Table IV), the same day as 15 Nisan. But if the incident occurred on 15 or 22 Tisri as the Sabbath, then 1 Nisan would have to be Thursday in that year. We know that the feast date in John 5 must have occurred between the first passover, as in (John 2), and the feast of the Jews in John 6, which itself was without doubt a spring festival on account of the abundant green grass described by both Mark and John. By consulting Table I, ~~during the crucifixion period,~~ we find two prospective dates ~~to be examined~~: the crucifixion years marked in

a. 28 A.D. -- April 15 -- Thursday = 1 Nisan

b. 30 A.D. -- March 26 -- Sunday = 1 Nisan.

The first date--1 Nisan on Thursday, 28 A.D.--would be followed by a Sabbath feast of tabernacles on 15 and 22 Tisri (Cf. Table V). The second date, --30 A.D.-- is altogether out, for it occurred after the feast in John 5. Hence 28 A.D. must be the year to which the feast in John 5 belongs. And it could not have been a passover festival, for in the whole ~~crucifixion period~~, epoch of Christ's ministry, there is no 1 Nisan on Sunday except in the year ~~case of the~~ 30 A.D.

There are ten or twelve important synchronisms in Ezra and Nehemiah, from which one is selected that aids in establishing the year that the wall was built.

4. Nehemiah Finishes the Wall.--The regnal years of the fifth century B.C. are fully established by the double-dated Assuan papyri. Nehemiah speaks several times with reference to the 20th year of Aratxerxes, and it is known ~~at once~~ that this year, according to the Jewish counting from fall to fall, coincided with the Julian year 445-444 B.C.[89] In the spring of 444 B.C., Nehemiah came to Jerusalem, and was eventually appointed governor by the people, without doubt the same year. Then he built the wall in 52 days, finishing the work

89 Parker, Richard

(Neh. 6:15).

on 25 Elul. The problem is to demonstrate whether the wall was built in the summer of the year 444 B.C., or in the following summer. (For this problem cf. Table IV.)

K

The Fifty-two Days

444 B.C.

S Ab S S

3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 -

S S Elul

19 - 20 - 21 - 22 - 23 - 24 - 25 - 26 - 27 - 28 - 29 - 30 - 1 - 2 -

S S

3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 -

S

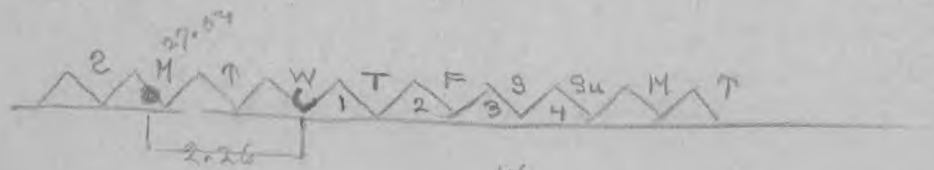
18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 (Tues)

Demonstration 10:

$\frac{e}{444}{}_{T}$ = Aug 25.41 = Aug 26.00 = W

or

July 26.95 = July 27.54 = M.



46
75
105
2.26

42
11.46
July 28.54 Conj.
14.92