Why cannot astronomers date the crucifixion?

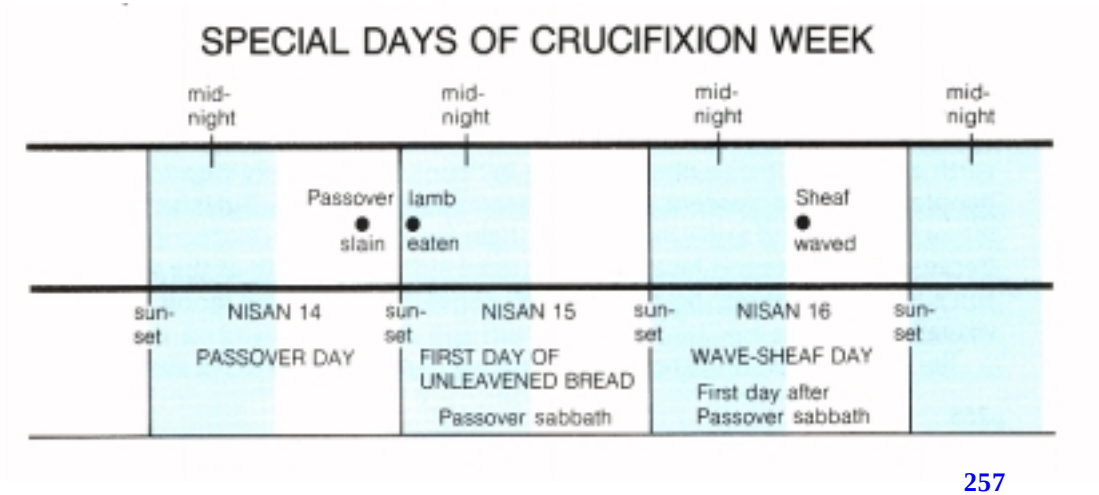
5. Why cannot astronomers date the crucifixion? Before we look at some of the reasons why astronomers cannot date the crucifixion, we need to know a few things about Passover, and we need to think about the moon.

The observance of Passover. In Exodus 12 Moses stipulated that Passover lambs should be killed on the fourteenth day of the first month of the Jewish religious year; that is, on Nisan 14, in the spring. Passover commemorated the miraculous deliverance of the Israelites from Egypt at the time of the Exodus. For the celebration in Christ's day, each large family, or group of small families, had a lamb slain at the temple during the afternoon of the fourteenth and then roasted it at home. After dark that night they ate the lamb along with bitter herbs and unleavened bread.

Because Jewish days began at sunset, the afternoon on which the Passover lamb was slain came near the end of Nisan 14; and the evening, when the lamb was eaten, was actually the beginning of Nisan 15.

Moses stipulated in Leviticus 23:6 that no leavened bread should be eaten for a whole week. Thus Nisan 15 was known as the First Day of Unleavened Bread. (in time the whole period from the slaying of the lamb to the last day of Unleavened Bread came to be known loosely as "Passover" and "The Feast of Unleavened Bread.") Whatever day of the week the *First* Day of Unleavened Bread fell on was regarded as a sabbath, the annual Passover sabbath (see Leviticus 23:7 and the *Jewish Encyclopedia).*

On the day following the First Day of Unleavened Bread—that is, on the day following Passover sabbath—Moses said (in Leviticus 23:9-15) that a sheaf of new, ripened grain should be waved before the Lord by a priest in the temple. Waving this sheaf of "first fruits" was a gesture of praise to God for the entire crop. It marked the moment when the barley harvest could begin. Paul used it as a symbol of Christ's resurrection as the "first fruits of those who have fallen asleep." 1 Corinthians 15:20.



A few observations about the moon. To twentieth-century urban dwellers, the celebrated orb of night is a pleasant but largely dispensable luxury. If we happen to notice it, surging up from the eastern horizon, orange and strangely oversize at the time of full moon; or if we happen to notice it in the west, a fragile crescent suspended in the ruddy glow of sunset, we may be enchanted for a moment, but that is all.

We don't feel we need the moon. We have electric lights to see by at night; we have printed calendars to tell the date by, and quartz-crystal digital watches to tell the time by.

Go back a couple of centuries, however, and the moon provided virtually all the night light that most people could afford. Go back two thousand years, and most calendars were conscientiously regulated by the appearance of the moon.

The word "month" comes from the word "moon." Originally a month was the twenty-nine or thirty days between the first appearance of a crescent moon at sunset and the first appearance of the next crescent moon.

The twenty-nine or thirty days! Twelve months of twenty-nine or thirty days each equal only about 354 days, which is eleven or twelve days short of the 365¼ days in the solar year. Because of the shortness of the so-called "lunar year," based on the moon alone, it was necessary in ancient times to insert a thirteenth month every second or third year. The result was a lunisolar calendar with some years about 354 days long and others about 383 days long.

Although the process seems awkward to us, the people then were used to it. By at least the fourth century B.C. Babylonian astronomers had developed a "nineteen-year cycle" that showed in advance just when to insert the extra months (seven times in the nineteen years) in order to keep the months more or less in step with the seasons and thus achieve optimum synchronization with the sun. After the Romans forbade the Jews to live in Jerusalem (about A.D. 135), Jewish observations from Jerusalem became impossible, and the Jews developed a cycle similar but not identical to the Babylonian one.

Have you noticed that when the moon is full it rises in the east at almost the very time when the sun sets in the west? Because the full moon is on the *opposite* side of the earth as compared to the sun, it is said to be in "opposition" to the sun.

The converse of a full moon is a "new moon." Whereas a full moon is in opposition to the sun, a new moon, which is located on the *same* side of the earth as the sun, is described as being in "conjunction" with the sun. Many people think that a crescent moon is the same as a new moon, but it isn't. A full moon is all light and a new moon has *no* light (except for a trace of earthshine). Because a new moon is located on the same side of the earth as the sun, the sun's light falls entirely on the side we cannot see and a new moon is to us virtually *invisible.*

But *the* moon is always *restlessly* changing its *relationship to* the sun and to

the earth. So it comes about that in several hours after new moon—or within a day, or two days, or even up to nearly four days (see page 261)—the moon so shifts its position in the sky that we are able to see a slender crescent of it hanging once again above the western horizon soon after sunset.

Among the Jews, Passover was timed to occur at or near a full moon at the beginning of the barley harvest; that is, soon after the spring equinox. It is known from the Gospels that Jesus died on a Passover (Nisan 14) that fell on a *Friday* in the early years of the procuratorship of Pontius Pilate. Astronomers are assumed to have unlimited capacity to calculate the motions of the heavenly bodies. To some Bible students,[18] therefore, it appears a simple matter to ask astronomers to give us the dates for the first full moon after the spring equinox in the years 29-33 and then to conclude that whichever full moon falls on a Friday must be the Passover of the crucifixion.

Of course, astronomers can readily supply all the new moons we need, and for that matter, all the full moons we may desire as well. Indeed, subtle and complicated though the necessary calculations are, in 1973 Herman H. Goldstine taught an IBM 360 Model 91 computer to figure out all the new moons and all the full moons between 1001 B.C. and A.D. 1651! And the computer calculated them—all 65,600 of them—in only 132 seconds.[19]

But how valuable are these staggering calculations for our purposes? They do help a little; but the problem is that we have to take into account several other vital factors, each of which, unfortunately, is imponderable and unknowable in the present state of astronomy and archaeology.

a. The law of the barley harvest. If the priests were required to wave a sheaf of fresh-cut barley (the first grain to ripen in Palestine) in the temple the day after Passover sabbath as a signal for the barley harvest to commence, the weather had to have been warm enough for a few weeks prior to Passover in order for the barley to be ripe.

The climate in Jerusalem can be bone-chilling cold as late as the end of March. I know this from experience. Because the twelve-month lunar year was so short compared to the 365¼ day solar year, Passover was frequently in danger of coming too early for the barley. Thus a thirteenth month often had to be inserted in March in order to lengthen the old year and to postpone the Passover and the day of Wave Sheaf. With this extra month inserted, Passover might come close to the second full moon after the equinox rather than to the first one. At our great distance from the time of Christ, no astronomer or archaeologist knows which years contained this thirteenth month.

b. The Babylonian or the barley-harvest cycle? We mentioned a moment ago that the Babylonians had a nineteen-year cycle under which the thirteen-month years were all arranged in advance. Archaeologists have learned what this cycle was and how to relate it to the Julian-Gregorian calendar that we use today. If we knew for certain that the Jews in Jerusalem followed the Babylonian cycle in the time of Jesus, we could easily transfer the Babylonian data to

Jerusalem and know without doubt which years contained the extra month. But we do not know that Jerusalem Jews were following the Babylonian cycle at the time, and there is evidence that they were not.[20] The Babylonian cycle would have placed Passover in some years *a month too early* for the barley harvest.

The Interpreter's Bible, in its comment on Matthew 26:17, is commendably cautious when it says that A.D. 30 maybe considered the date of the crucifixion "*if*" the Palestinian Jews were, at the time, following the Babylonian cycle—which, quite evidently, they were not. On the contrary, A.D. 31 is as possible as A.D. 30 if atmospheric and astronomical conditions combined to place Nisan 1 that year at a maximum interval after the new moon.

c. Visibility of the crescent. According to ancient custom, before a crescent moon could be counted as marking the commencement of a month, it had actually to be seen and reported to a committee of priests. Official observers stood on vantage points at sunset on the 29th of a month and scanned the western sky eagerly. The earliest crescent often cannot be seen until the sun has set long enough for the dusk to be somewhat advanced, and often it is so close to the horizon by then that it drops out of sight after being visible to a trained eye for only a few minutes.

If there were a low-lying cloud, if merely a denser-than-average haze polluted the horizon at Jerusalem, the anticipated crescent would not be observed. The current month would be continued an additional day, making it thirty days long. And the new month would commence on the following night, even if the crescent were still obscured. (Remember that Jewish days and, hence, Jewish months and years, began at sunset.)

Nisan 14 commenced at sunset on the fourteenth night, counted "inclusively," after the official announcement of the crescent.

Even if modern astronomers were able to tell us the precise evenings when the new spring crescents were most likely to have been seen at Jerusalem in A.D. 30 to 33, they still could not tell us for sure that they were actually seen on those nights, because they have no way of knowing what atmospheric conditions prevailed there at the time. Consequently, even if they could give us the true nights when the crescent moon should have been seen, they still could not tell us whether that night was actually counted as Nisan 1 or as the 30th of the preceding month. And this weakness is crucial, because in order to locate the Friday of the crucifixion, which was a Nisan 14, the 1st of Nisan must of course be known precisely.

We are looking for a Passover—that is, for a Nisan 14—that occurred on a Friday sometime in the years 30 to 33; and we are expecting, from the "midst of the week" prediction, to find it in A.D. 31. The point we are making is that it is impossible to prove from astronomy which of these years actually had a Nisan 14 Friday.

Was Friday, April 7, A.D. 30, the Passover Day of Christ's crucifixion, as

many commentators have assumed? It may have been, if the crescent appeared after sunset on Friday, March 24, fourteen nights earlier. But if the crescent was obscured on March 24 and the month had to begin a day late, then Nisan 14, Passover Day, did not come on Friday, April 7 but on Saturday, April 8—and the year A.D. 30 is disqualified. Or, perhaps in this particular year the weather was cold, the barley was slow, and Nisan was required to commence on the night of the new crescent a month later; then Nisan 14 fell on a Sunday or Monday, and, once more, A.D. 30 is disqualified.

d. The interval between new moon and the cresent. We mentioned on page 259 that the interval between new moon and the crescent can be as short as a few hours or as long as almost four days. Here is one of the most perplexing of problems. Some commentators who presume to tell us the exact Friday on which the crucifixion fell assume that the crescent always appeared either on the same day as new moon or on the following day. They think they can tell the evening of the first crescent just by glancing at Goldstine's list of new moons. They do not realize the *variability* of the interval between new moon (conjunction) and the visible crescent.

Achilles Tatianus in the sixth century A.D. observed that the crescent moon appears up to "three or four days after [the] birth [of the moon] ... and not at the same time she was born."[21]

Joannes Hevelius in the seventeenth century warned that "the first rising of the moon does not generally happen on the first day after conjunction, but at length on the second, often also on the third and foutth."[22]

And an ancient astronomer named Geminus has been quoted as saying "that when the moon is in *perigee*, and her motion quickest, she does not *usually* appear until the second day, nor in *apogee*, when slowest, until the fourth. The exception in the former case intimating that she might sometimes be seen on the first day."[23]

Fully in harmony with these statements, there is reason to believe that in the year A.D. 30 the crescent may not have appeared on March 24 (see above), even if the weather had been fine, for the interval between the new moon of March 22 and its subsequent crescent may well have been longer than two days; and, if so, Nisan 14 would not have occurred on a Friday. But a Nisan that starts as late as March 25 is still quite early for the barley harvest; so it is likely that it started twenty-nine or thirty days later, in April, making a Friday Nisan in A.D. 30 quite impossible.

e. Sectarian differences. A fifth matter for concern in dating the crucifixion by the moon is evidence in the Gospels that in the time of Jesus the Jews themselves, even in Jerusalem, were not agreed on how to calculate the Passover! The priests may even have used calculations partly independent of the moon!

Although on the week Christ died the official slaying of Passover lambs took place on Friday afternoon and the feast on Friday night, Jesus and His disciples

prepared their Passover lamb on Thursday afternoon and ate it on Thursday night. And the account in the Gospels leaves the impression that what Jesus and the disciples did many other people were doing, for it appears to have occasioned no surprise.

There is, moreover, evidence from the Dead Sea Scrolls[24] that the Essene community taught that Passover should always be celebrated on a Wednesday, without regard either to the moon or to Nisan 14!

It is possible, therefore, that Passover was observed in Palestine by different groups on *Tuesday, Thursday, and Friday nights* in the year when Jesus died! If the Jews could not agree on how to calculate Passover in terms of the moon, truly we do not have any positive way of determining the date of Christ's death by asking astronomers to pick out a Friday, Nisan 14.

Professional astronomers warn us that they are indeed incompetent to date the crucifixion. For example, D. H. Sadler, superintendent of the *Nautical Almanac* office in the Royal Greenwich Observatory in England, states that "purely local conditions can invalidate even the most careful work in respect of a particular observation of the lunar crescent."[25]

Nonastronomers are properly impressed by the ability of astronomers to predict eclipses. But in contrast to the reliability of eclipse calculations, Professor O. Neugebauer, expert on ancient astronomy at Brown University, says that "exactly the opposite, however, is the case in the problem of first visibility [of the crescent moon]. All modern tables have to make arbitrary assumptions as to the visibility conditions in antiquity in general or in specific localities. These assumptions are highly arbitrary, and even for modern times, extremely unreliable. Since the phenomenon of first visibility is connected with sunset, all such tables involve inaccuracies of one full day."[26]

Specifically in reference to the subject of our present quest, G. M. Clemence of the U.S. Naval Observatory wrote that "the interval from new moon to the appearance of the crescent cannot be calculated from theory alone. Criteria must be established empirically for each individual geographical locality. Different writers have not always agreed completely on these criteria; and, moreover, some allowance presumably must be made for variations due to local practices and circumstances at the time of each observation. . . . *The dates of Nisan 14 in the years of the first century of the Christian era cannot possibly be determined by any astronomical calculation; they can be fixed, if by any means at all, only by the study and interpretation of contemporary records.*"[27]

So, when all is said that can be said by astronomy, we are best off to accept the biblical statement that Jesus would "cause sacrifice and offering to cease" "in the midst of the week."

There is no reason not to take A.D. 31 as the year of the crucifixion.

6. Was a Passover Friday possible at all in A.D. 31? Mindful of every caution in the previous answer, curious readers may still hanker to know whether astronomy can in any way discern a Friday crucifixion in A.D. 31.

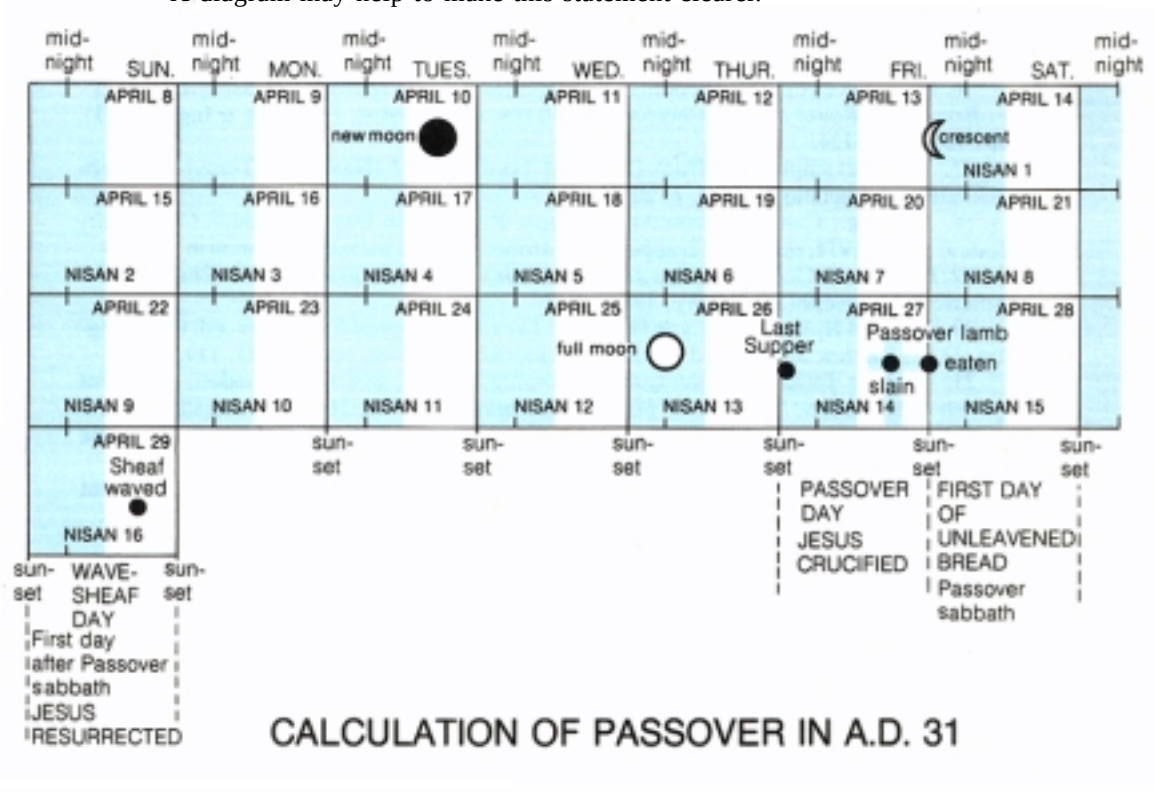
The answer is that, yes, a Friday crucifixion in A.D. 31 is entirely "possible" according to astronomical calculations (for whatever they may be worth), granted a few unprovable yet reasonable assumptions.

We assume to begin with that the March 12 new moon (conjunction) was too early for the barley-harvest requirement. (Dated Jewish papyri found at Elephantine do not allow Nisan to begin as early as March 14, and neither did the Babylonian cycle.) So, with March 12 regarded as too early, the new moon prior to Nisan 1 in the year 31 becomes the one listed as number 12755 on page 86 of Goldstine's computer printout, for Tuesday afternoon, April 10. Goldstine's time for the new moon is 2:45 p.m. in Babylon. In Jerusalem, some 850 kilometers or 525 miles to the west, the new moon occurred thirty-seven minutes earlier, local time.

If the interval between this April 10 new moon and the first visibility of the crescent moon at Jerusalem was a very long 3.19 days, as it could have been, or if it was shorter but was obscured the first night, the crescent was observed at sunset on Friday, April 13.

With the observation of the crescent, the month of Nisan commenced at once and Nisan 1 should be dated in our Julian-Gregorian calendar as the Saturday, April 14, which followed at midnight. The fourteenth night thereafter, counting the evening of the crescent (inclusive reckoning), brought Jerusalem to the commencement of Nisan 14 at sunset on April 26, a Thursday. Thus April 27, the Passover day on which Jesus died, was a Friday-Friday, Nisan 14, A. D. 31.

A diagram may help to make this statement clearer.



CALCULATION OF PASSOVER IN A.D. 31

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3. Jacques Doukhan, "The Seventy Weeks of Daniel 9: An Exegetical Study," *Andrews University Seminary Studies* 17 (1979):1-22.

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5. Hippolytus, *Commentary on Daniel*, frag. 2.39, 40; ANF, 5:184.

6. Harold W. Hoehner, *Chronological Aspects of the Life of Christ* (Grand Rapids, Mich.: Zondervan Publishing House, 1975), pp. 95-98.

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9. Young, *Daniel*, p. 209.

10. See, e.g., W. R. Thompson, "Chronology of the New Testament," *The Zondervan Pictorial Encyclopedia of the Bible*, which recommends A.D. 33 or 34 for the conversion of Paul, and *The Westminster Dictionary of the Bible*, rev. ed., art. "Paul," which suggests A.D. 35. The stoning of Stephen occurred at some point prior to Paul's conversion.

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12. See *ibid.*, 1:750.

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15. *Ibid.*, pp. 308, 312.

16. For a survey of the work of the Masoretes (sometimes spelled, "Massoretes") see F. F. Bruce, *The Books and the Parchments*, 3d rev. ed. (London: Pickering & Inglis, 1963), pp. 40-42, 117-124.

17. These examples are from Desmond Ford, *Daniel* (Nashville, Tenn.: Southern Publishing Association, 1978), p. 229.

18. See, e.g., Caird, "Chronology." Roger Rusk, "The Day He Died," *Christianity Today*, March 1974, pp. 720-722, appeals to astronomy for a Thursday full moon in A.D. 30.

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22. Joannes Hevelius, *Selenographia* (Gedani, 1647), p. 274, in Amadon, "Ancient Jewish Calendation," p. 260.

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