



Type: Book Chapter

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## Seasonality of Warfare in the Book of Mormon and Mesoamerica

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Source: *Warfare in the Book of Mormon*

Editor(s): Stephen D. Ricks and William J. Hamblin

Published: Provo, UT/Salt Lake City; Foundation for Ancient Research and Mormon Studies/Deseret Book, 1990

Page(s): 445-477

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## Seasonality of Warfare in the Book of Mormon and in Mesoamerica

*John L. Sorenson*

When we carefully examine the accounts of wars in the middle portion of the Nephite record, we find that military action did not take place at random throughout the calendar year but at particular times. Whatever realistic scene we assume for the Nephite lands, we would expect to find a similar seasonal pattern in that area's secular historical sources. I consider Mesoamerica (central and southern Mexico and northern Central America) to have been the scene of the Nephite conflicts, but whatever plausible location one chooses will lie in the tropics because, among other reasons, only in those areas are there feasible isthmuses located that could correspond to the "narrow neck of land" of the Nephites. Everywhere in those latitudes, war was normally carried on by the pre-Columbian inhabitants during a short annual period. This paper investigates the evidence for seasonality of warfare in the Book of Mormon account and compares it with what is currently known about the timing of warfare in Mesoamerica.

### **The Book of Mormon Pattern**

For only one period are we presented with sufficient information to detect a seasonal pattern for fighting – during the period beginning with the fifth year of the reign of the judges (Alma 2) and continuing for about 110 years. Other reports of war (in 2 Nephi, Jacob, Enos, Jarom,

Omni, Words of Mormon, Mosiah, Alma 24 and 27, Mormon, and Ether) give us little useful data on the topic. I have listed in an appendix all "military actions" in the Nephite part of the record in order to allow readers to examine the data for themselves. I conclude that a remarkably consistent record of seasons for conflict emerges.

The first and probably prime determinant for scheduling wars was the need to provide food according to a natural cycle that allowed few exceptions. We learn quickly that the middle of the Nephite calendar year was the growing season and that the primary harvest became available toward the end of the year. Since no army could operate effectively without a reasonably secure supply of food, this meant that wars had to await the completion of the agricultural year. This fundamental principle is clearly expressed in Alma 53:7, which says regarding Moroni and his forces: "He did no more attempt a battle with the Lamanites in that year, but he did employ his men in preparing for war . . . and also delivering their women and their children from famine and affliction, and providing food for their armies."

The idea appears in other texts:

1. Alma 57:6; 58:4, 7: "We [Helaman's army] received a supply of provisions. . . . And . . . we were strong, yea, and we had also plenty of provisions." But later "we did wait to receive provisions . . . until we were about to perish for the want of food."

2. Alma 60:9, 25, 35: "Ye have withheld your provisions from them, insomuch that many have fought . . . when they were about to perish with hunger. . . . Except ye . . . grant unto them food for their support," Moroni and his men would render foot-dragging officials "extinct"; "God will not suffer that we should perish with hunger; therefore he will give unto us of your food, even if . . . by the sword."

3. Alma 61:16, 18: Pahoran had "sent a few provisions

unto [Lehi and Teancum], that they may not perish." He and Moroni aimed to "take possession of the city of Zarahemla, that we may obtain more food."

4. Alma 62:29: Lamanite prisoners joined the people of Ammon in a crucial task in which they "did begin to labor exceedingly, tilling the ground."

5. Alma 4:2: "But the people were afflicted . . . for the loss of their fields of grain, which were trodden under foot and destroyed by the Lamanites." (The Lamanites obviously had attacked near the end of the year, when ripe grain was standing in the fields. Suffering would continue until the next annual crop was ready.)

In civilizations at such a level of technological development, armies were formed of nonprofessional militia. For example, Alma 44:23 says, "The armies of the Nephites . . . returned and came to their houses and their lands." The demand for manpower to carry on agriculture provided the most stringent limit on maintaining armies. The husbandry of those times simply could not provide sufficient reliable surplus to feed many soldiers who were not themselves involved in the seasonal work. When an army did have to be kept in battle readiness, an added burden fell on the men who were still cultivating; thus the pacifist people of Ammon were obliged to exchange the products of their labor, "a large portion of their substance to support our armies," in exchange for protection by Nephite soldiers (Alma 43:13). But unavoidably, most of those serving in the army had to meet farming's demands during part of the year.

Another seasonal consideration was the weather. Anywhere in the tropics, rain characterizes approximately half the year—the same season when the crops are growing—with resulting muddy trails and swollen streams to cross. In all likelihood, the only time when Alma and his forces could have waded across the river Sidon, fighting as they went (see Alma 2:27), would have been in the drier part

of the year. Furthermore, had armies been fighting during the rains, they would have suffered significantly while traveling, camping, or fighting, for that time can be uncomfortably cool and unhealthy. Typically the Lamanites traveled virtually naked to reach the Nephites (see Enos 1:20; Alma 3:5; 43:20, 37). They would not have done so had protecting themselves against rain and cold been a concern. On the contrary, heat-caused fatigue was mentioned as a problem in the lowlands (see Alma 51:33; cf. 62:35). So the scripture confirms logic and observations about the timing of warfare in tropical lands—the rainy season ruled out major campaigns, which took place in the dry season instead.

Of course, there could be exceptions. Regions varied in climate; certain places and times would have permitted at least limited fighting other than at the normal dry time, although we must assume that planned major campaigns had to follow the general rule.

### **The Nephite Calendar**

An entirely different matter concerns the translation of statements in the scriptural text from its calendrical terminology into climatic terms. The annals of the wars upon which Mormon relied in constructing his record were phrased in terms of “months” and “years”; at least that is how the terms were translated into English by Joseph Smith. But was a given numbered month hot or cool, dry or wet?

The world’s peoples have used “years” measuring 260, 354, 359, 360, 363, 364, 365, and 400 days, among others. No calendar fits precisely the duration of the period it takes the earth to complete a revolution around the sun (the general definition of “year”).<sup>1</sup> Each system only approximates nature’s periodicity, then either includes adjustments so that its count does not get far out of step with solar realities or else the system falls into increasing dis-

crepancy. In the case of the Nephites, their record gives us insufficient information to permit us to describe their calendar with confidence. We can only make certain observations about it and then draw sensible inferences about the remaining features. We cannot clarify the matter by citing potential Near Eastern precedents, for the Book of Mormon gives us no information about the calendrical knowledge possessed by Lehi's pioneering group.

In any case, the assumption of a single calendar might be misleading. Based on how peoples at the Nephites' level of civilization tracked time, I would be surprised if the Nephites had not followed more than one system, perhaps one for ritual, another for agriculture, and at least one other for their political and historical annals. Also different localities could have followed differing systems. The checkered cultural history of Mulek's descendants (see Omni 1:17), the Ammonihahites' purposeful distancing of themselves from Zarahemla's ways (see Alma 8:11–12), and the Zoramites' divergence from Nephite culture (see Alma 31) hint at such potential diversity. A historical case illustrates how much variety is possible within a small territory: in and near the basin of Mexico at the time of the Spanish conquest, there were at least twenty-one major cultures present, only one of which, that of "the Aztecs," is well known; and many of those groups maintained differing calendrical systems and historical traditions.<sup>2</sup>

For the early people of Zarahemla (the "Mulekites"), Omni 1:21 refers to "moons" as a time measure, strongly indicating that they followed a lunar calendar. But "moon" is never again mentioned. Instead, the word "month" occurs throughout the text that Mormon edited, suggesting that the Nephites followed a different system. Mosiah may have imposed this as the norm for keeping historical records when he became king at Zarahemla (see Omni 1:18–19). Helaman 12:15 indicates that the Nephites, at least by Mormon's day, considered the earth to move around the

sun, suggesting a solar calendar and system that was probably operational throughout at least the six-hundred-year period for which we have Mormon's abridgment.

Whatever knowledge of the calendar Lehi and Nephi brought with them is suggested, or at least limited, by what historical sources tell us of the pre-exilic Israelite calendars.<sup>3</sup> A solar calendar was used that apparently had Canaanite—and ultimately Egyptian—sources and was closely connected with the seasons, and thus the festivals, marking the agricultural year in Palestine. It had twelve months of thirty days each. Some method was also used for intercalating days to keep the count straight with the sun's year (probably by adding five or more days at the end or beginning of the year.)

A cultural revamping, termed the Deuteronomic reformation, is thought by scholars to have taken place beginning at the time of King Josiah of Judah (who died in 608 B.C., within Lehi's lifetime). This reform effort attempted to root out pernicious cultic influences from the Canaanites and other neighboring peoples (see particularly the list of ritual abominations in 2 Kings 23:4–20). The reform enhanced the role of the then-neglected temple at Jerusalem, eliminated or reduced local shrine-centered variations in worship, and officially adopted the Assyrian-Babylonian calendar, which emphasized the moon instead of the sun in year and month calculations. At the same time, it shifted about or amalgamated religious festivals to fit into the new calendar scheme and to break up the old Canaanite pattern. But it is likely that nearly all this concern for change was on the part of Jewish priestly reformers while most of the population preferred to continue with the old ways. Certainly two, and later at least three, calendar systems coexisted.<sup>4</sup>

It may be helpful to consider what might have happened to the Lehi colony upon leaving their homeland near Jerusalem. What happened with the colony of Jews

that settled at Elephantine in Egypt around the same time, as well as the changes that occurred among the Jewish exiles in Babylon, must have been comparable in many ways to what occurred in Lehi's group. The cultural dynamics induced and required among each of these groups of resettled Israelites of the sixth century B.C. would be very similar.

Like the Nephites, the Elephantine people built a temple modeled after the one at Jerusalem, but their calendar followed the local Egyptian one. The calendar they used to set their festivals had been heavily modified by the Babylonian and Persian conquerors of Egypt. In Babylon, too, the exiles quickly adapted to the local lunisolar calendar, which returnees in the days of Nehemiah and Ezra would later bring back to Palestine. Change was inevitable since, after all, in Judah knowledge of the calendar of the day must have been limited to courtly or priestly specialists. Likely none of the resettled groups included people who were highly informed in such matters. The new conditions of seasons and ecology, as well as socio-cultural influences from neighbors, moved them to adapt their calendar from what in the Palestine homeland had been based on nature or imposed by Jerusalem to something simpler and surely more functional in the new settings.

With Lehi's people we may suppose in the first place that their arduous trek across western Arabia would have stripped them culturally of much of what they knew about calendrical matters at home. Crossing the sea to a different environment would have wiped their cultural slate even cleaner (cf. Nephi's observations in 2 Nephi 5:7–16 and 25:1–6). For example, the Shavu'ot festival, which in the land of Israel had fallen in late spring, fifty days after the first grain was harvested,<sup>5</sup> could not have been carried on in tropical America without change, for there the late spring was exclusively a time for planting, not harvesting



(fifty days after the first harvest in Mesoamerica would fall in December).

I consider it likely that the Nephites carried with them the basic twelve-month solar calendar of the old regime; even during their travel in Arabia they continued to keep track of “years,” after all. Reasons for thinking this include (1) Lehi was strongly opposed to the Jewish establishment of his day, certainly including the nationalistic, Deuteronomic reformer priests, and hence would have resisted following the Assyrian-Babylonian lunisolar count they urged; and (2) his own Manassehite tribal background meant that he would have stayed closer to Egyptian and traditional Israelite ways rather than following the new-fangled Babylonian count.<sup>6</sup> (However, King Zedekiah’s son Mulek and his company would have been more likely to follow the reformers’ calendar, which emphasized “moons” as well as the naming rather than the numbering of months.)

The highest numbered month mentioned in the Book of Mormon is the eleventh (see Alma 49:1). (The highest day number is the twelfth – see Alma 14:23.) Still, two texts in the Book of Mormon point to the likelihood that the Nephites recognized twelve months. Alma and Amulek were freed from prison in Ammonihah on “the twelfth day, in the tenth month” (Alma 14:23). The events reported to intervene between then and the end of the year (see Alma 15:16) can be accommodated very plausibly in the roughly eighty days remaining in a twelve-month solar year. The same kind of general confirmation occurs in Alma 49, which reports a Lamanite army approaching the land of Ammonihah on the tenth day of the eleventh month (see Alma 49:1). Subsequent action until year’s end (Alma 49:29) would fit well into the remaining fifty days allowed by a solar year but could hardly have stretched much longer.

Incidentally, the old Israelite “Calendar I” quite clearly

incorporated the necessary corrections by adding days to keep sun and day counts from getting out of whack. Just how this was done is not clear, but the use of leap days is almost inevitable.<sup>7</sup>

In the present discussion, I assume that the dates mentioned in the period from Alma 2:1 to 3 Nephi 2:8, during which virtually all references to warfare in calendrical terms occur, were calculated on a 360- or 365-day solar-based calendar, though this was probably just one of the calendars the Book of Mormon peoples followed.<sup>8</sup> I further assume that the Nephites recognized twelve months of thirty days each, with a probable five-day intercalary interval at the end of the last month.

### The Nephite Annals of Wars

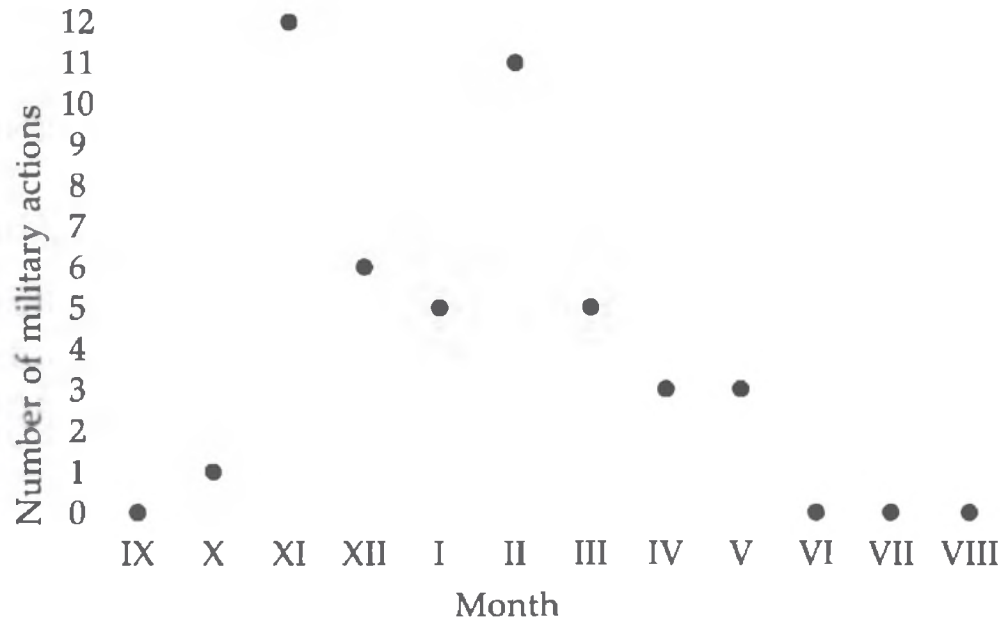
This paper is based upon information laid out in the appendix (see "Appendix: Annals of the Nephite Wars," pp. 462–74). In every case where Mormon provides us with sufficient chronological information to be helpful, I have analyzed and presented the plausible duration and distribution of events within each year. Even where chronology seems limited or absent, I tabulate each "military action" for the sake of completeness and because others may see in the text things I have failed to see.

In the first of four columns is a "military action reference number," beginning with the number 1. Omitted are the wars of the people of Zarahemla mentioned generally in Omni 1:17 and the purely Lamanite wars (in general at Mormon 8:8; note also Helaman 5:21), but those reported by the people of Zeniff and the sons of Mosiah are included. The list thus includes all actions involving Nephites *per se*. Actions planned, though not consummated, are counted, for they suggest times perceived to be appropriate for war even if a conflict failed to materialize. Other significant information has also been included in the table.

Figure 1 summarizes the information on the seasons in relation to war as presented in the appendix. There are forty-six months to which a military action has been assigned (if an action carries into a second month, each month is counted separately). For each I have indicated a date, by year, month, and day as far as the record permits. Admittedly my assignment of months is subject both to the limitations of the data in the text and to my interpretations of it. Possibly I have skewed the months to fit my preconceptions, but not consciously. In any event, my month assignments are displayed so that others may check and modify my dates if they consider that necessary. Whatever bias may be involved, the pattern that emerges is too dramatic for me to have imposed it on the data. For each date given in the appendix, I also show an indicator as to whether it was (a) derived from a specific statement of the month, (b) inferred from a textual statement about the commencement or ending of a year, or (c) simply plausibly inferred by interpolating the year's events reasonably across twelve months.

Figure 1 vividly shows that wars did not simply happen at random but with striking seasonal variation. Twin peaks near the end and again near the beginning of the year are emphatic. If my assignments of just a few less-than-certain cases to the eleventh and the second months should be off by only a few weeks, the pattern might more nearly appear as a single four-month season. I consider it likely, however, that the decline in twelfth- and first-month activity is real and probably owing to the wish not to interfere with ritual observances of the year's end/beginning, or else to a concern with "bad luck" tied in with the five intercalary days that in later Mesoamerica were considered unlucky. (Compare the implications of Alma 51:28–52:2 regarding the Lamanites who pressed their attack during their new year's eve day only to meet disaster.) Furthermore, such military actions in the third through sixth months tended

**Figure 1. Number of Months Involving Nephite Military Actions**



to be minor. Major actions thus clearly occurred between the end of the tenth and the start of the fourth month.

When statements in the record about food or “provisions” are analyzed, a confirming pattern emerges. The second month is most frequently indicated as time for re-provisioning (seven occurrences), with the third month next (four occurrences). Two cases may indicate logistical support somewhere between the fifth and tenth months. In addition there are single references for the twelfth, first, and fourth months. These combine to form a consistent season for primary replenishment from, say, the twelfth through the fourth months. This is agreeable with having the harvest primarily in the tenth through twelfth months. (After the crop was mature, actual harvest work would have required some time, followed by an administrative process of assessment or taxation, and then transport to the armies.) Of course limited local supplies were no doubt furnished to the forces at almost any time of year, but I

am talking about the primary supply effort. Moreover, three references to hunger conditions for soldiers are consistent in falling between the fifth and tenth months.

### **Seasons of War in Mesoamerica**

Our information on the timing of warfare in this area has not been examined comprehensively by scholars. What is known is consistent, for example, with the fact that in Yucatan, wars were usually fought between October and the end of January (or February in other Mesoamerican regions).<sup>9</sup> In that period, travel was rarely restricted due to bad weather; it was still relatively cool, and food was available either by supply from the logistical base or by taxing the subjugated.

The schedule varied slightly depending on local topography and climate. The corn crop, fundamental in the diet everywhere in Mesoamerica, is typically planted in April or May, just before the rains begin and after the fields have been cleared and the rubbish burned. It can be harvested about the time when the clouds and rain taper off (the wettest months are July and September for most regions) and the temperature rises because of greater sunshine. Harvest is from October to December, again depending on locality and on crop variety. The crucial time for agricultural labor under this regime is, and was anciently, March through May. At other times, being away was inconvenient but not critical. Probably the segment of time freest from field work for the typical cultivator/warrior was November through February, which, of course, coincides with the war season. Under emergency conditions, naturally, some military action could go on, though hampered, throughout most of the year.

### **Comparing the Patterns**

The congruency of the two bodies of data is obvious in their division of the year into fighting and nonfighting

times, the former during weather compatible with travel and the latter at planting season. This is so unmistakable that point-by-point comparison is hardly needed.

When we see in such marked fashion that the bulk of the military action for the Nephites took place during their eleventh through second months, while in Mesoamerica late October into February was battle time, I must equate the two patterns. If Mesoamerica is the location of Book of Mormon wars, as nearly all Latter-day Saint students of the matter now believe, there is no alternative to concluding that the Nephite new year day during the first century B.C. fell late in December. The winter solstice is perceived by so many of the world's peoples as an obvious phenomenon of cosmic significance that December 22, give or take a day, is the odds-on favorite also to have been the Nephites' new year marker.<sup>10</sup>

Supposing that is the case, we find the following equivalences:

**Table 1. Probable Nephite Calendar during the Reign of the Judges**

First month	About December 22 to January 20
Second month	About January 21 to February 19
Third month	About February 20 to March 21
Fourth month	About March 22 to April 20
Fifth month	About April 21 to May 20
Sixth month	About May 21 to June 19
Seventh month	About June 20 to July 19
Eighth month	About July 20 to August 18
Ninth month	About August 19 to September 17
Tenth month	About September 18 to October 17
Eleventh month	About October 18 to November 16
Twelfth month	About November 17 to December 16
Probably five extra days completed the year.	

### **Two Possible Exceptions to the Pattern**

But our comparison must consider a couple of possible exceptions to the generalization that major military actions

fall at the year's end or beginning. One is the battle in which Helaman and his two thousand young warriors helped lure a Lamanite army out of Antiparah to its destruction. This event is said to have occurred early in the seventh month (see Alma 56:42). The other is the attack by robbers on the besieged Nephites under Lachoneus; it is placed in the sixth month under a different calendar system (see 3 Nephi 4:7).

In the first place, the accuracy of the seventh-month date in Alma 56:42 might be questioned. I have shown in another paper<sup>11</sup> that Helaman's recollection of some dates was probably in error, for he omitted one entire year from his narrative. This is understandable because his record, an epistle to Moroni, was hastily written in the field immediately after concluding long, rigorous combat. A careful reading of Alma 56:27–30 indicates to me that Helaman's date for the battle near Antiparah may have been erroneous.

Consider the following statements: The text first reports the arrival of food and reinforcements for Helaman's and Antipus's army in the second month, "*thus we were prepared*" with both warriors and supplies (Alma 56:27–28). And, "*the Lamanites, thus seeing our forces increase daily, and provisions arrive for our support, they began to be fearful, and began to sally forth, if it were possible to put an end to our receiving provisions and strength. Now when we saw that the Lamanites began to grow uneasy on this wise, we were desirous to bring a stratagem into effect upon them*" (Alma 56:29–30; italics added). The expressions I have emphasized connote passage of only a short period of time. Despite Helaman's dating the subsequent engagement to the seventh month, the phrasing and logic of these verses make it seem unlikely to me that the interval between the arrival of the food and the tactical action would encompass up to five months. Moreover, it is somewhat doubtful that Helaman would carry, or credibly appear to

carry, food to a neighboring city at the seventh month, an odd time for reprovisioning.

Also, an explanation can be offered for a dating error, although perhaps it is strained. Two comments made when this paper was read publicly suggested that Helaman might have miswritten the month number due to features of either Mesoamerican glyphic or Hebrew conventions for writing numbers. Professor John P. Hawkins suggested that perhaps Helaman made an arithmetical mistake while referring to calculations involving the Mesoamerican bar-and-dot system of numbers. There a seven would appear as two dots above a bar. A stray mark that was misread as a bar could produce a seven, from an intended two. On the same occasion, John Tvedtnes drew attention to the fact that, in Hebrew, mistakes sometimes occur among the numbers two, three, seven, and eight due to confusion when those numbers are abbreviated. Either effect might have been involved for Helaman, although I am uncertain whether Helaman used either the bar-and-dot system or Hebrew in his epistle where he made the putative error.

On the other hand, if the conflict did take place as early as the third month, the account seems to get to the end of the year rather abruptly (see Alma 57:3–5). Hence one can argue pro and con without any way to settle the issue given the present limited text. (In figure 1, I have simply not counted this incident, nor any others from the appendix with a question mark.)

Even if the seventh month should prove correct, a unique geographical circumstance could mean that the “rainy season” would not have ruled out this particular action. The location of Antiparah in the geographical correlation I follow is near Motozintla, within a few miles of the Guatemalan border and almost at the top of the pass over the Sierra Madre de Chiapas linking the Central Depression of Chiapas and the Pacific lowlands.<sup>12</sup> Peculiar geographical conditions affect rainfall there. A configura-



tion of high peaks (the highest mountain in Central America is only a few miles away) makes the northeast versant of the mountains, including the little Motozintla valley, unusually dry by shielding it from moist air off the Pacific. The abbreviated wet season in this locality consists of two peaks each less than two months in length, April-May and September-October. Even then, annual rainfall in the valley is only a fraction of what it is on the peaks a few miles away. An early seventh-month battle would fall around June 21 on the Nephite calendar (see table 1). This is within the annual period called the *canicula* ("dog days") or *veranillo* ("little dry season"), when in most years the rains let up for a period of one to three weeks.<sup>13</sup> Thus for good reasons, even if Helaman's battle was in the seventh month, the weather could have allowed such an event. Interestingly, on the calendar laid out above, a seventh-month attack would have taken place within a day or two of summer solstice, if not precisely then, and may have been planned to fall exactly on that auspicious day.<sup>14</sup>

Another problem in chronology occurs when the robbers in the time of the Nephite judge Lachoneus launched their main attack on the Nephites' refuge area in the "sixth month." But the event took place following the change in the era for reckoning the Nephite year, as reported in 3 Nephi 2:5-8. We are told there that when nine years had passed from the signs of the Savior's birth, the Nephites took that event as a beginning for their new system for calculating time.

As we look back at the record of that marker event, we learn that it did not take place at the new year but sometime afterward. Here is what 3 Nephi 1 reports about the timing. In "the commencement of the ninety and second year, . . . the prophecies . . . began to be fulfilled more fully" with the appearance of greater signs and miracles among the people (3 Nephi 1:4). Some people began to say that the time was past for the prophecy of Samuel to

be fulfilled and they began to rejoice over the fact (see 3 Nephi 1:5–6). “It came to pass that they did make a great uproar throughout the land” (3 Nephi 1:7). Believers, however, watched steadfastly for the day and night and day without darkness that had been prophesied (see 3 Nephi 1:8). “There was a day set apart” when believers would be destroyed if the prophesied event did not take place (3 Nephi 1:9). Note how many time-significant phrases occur in these verses—“began to be,” “began to say,” “began to rejoice,” “and it came to pass,” “began to be,” “did watch steadfastly,” and “now it came to pass”—all of which point to the passing of a considerable length of time between the end of the ninety-first year and the dramatic event of the light-filled night. An interval of months seems required by this language. (The statements about events during the remainder of the ninety-second year, in 3 Nephi 1:22, 23, and 25, are more obscure in regard to chronology.)

What we know from Palestine about the crucifixion sets the date in early April. (In light of the statements on chronology in the four Gospels, the only legitimate possibilities, it appears, are April 7, A.D. 30, or April 3, A.D. 33.)<sup>15</sup> If we suppose the old Nephite year ended around December 22, while the birth date of Jesus occurred in the beginning of April, we can accommodate the Book of Mormon statements about dating. The Nephite calendar adjustment would then have been about three-and-a-third months.<sup>16</sup> This would allow enough time to encompass the events reported in the text prior to the special day and would also fit the Palestine data.

In that case the beginning of the Nephite year in the new system would have been in the first week of April. The attack of the robbers reported in 3 Nephi 4:7 in “the sixth month” would then have fallen in September, as late as the twenty-seventh. In weather terms that would not normally be a good time for fighting, although in a particular year, it might have been feasible. One explanation

for this anomalous date is the robbers' desperate need for food. Given their evident extremity, that may be reason enough for hastening their campaign. (In the tabulation of military actions, I have marked this event with "VI," but I have not counted it in figure 1.)

The major conclusions of this study are

1. Nephite wars were typically carried out early in the dry season as permitted by the agricultural maintenance pattern and when weather conditions were most suited for military campaigns.

2. With overwhelming probability, the Nephite calendrical system used to report their wars in the first century B.C. placed their new year day at or very near the winter solstice.

3. Shortly after the birth of Christ, the Nephite calendar system changed to a base that seems to have put their new year near the beginning of April.

4. The Nephite seasonality pattern for warfare agrees remarkably well with what we know from Mesoamerica about seasons for fighting and for cultivation and harvest.

5. Two possible anomalies in the agreement between the two patterns exist, but reasonable explanations can be provided for each.

### Appendix: Annals of the Nephite Wars

**Key: # = Nephite records**

**Z# = Zeniffite record**

**SM# = Sons of Mosiah record**

**Superscripts:**

**L = Lamanite initiative**

**N = Nephite initiative**

**NvsN = Nephites vs. Nephites**

**LvsL = Lamanites vs. Anti-Nephi-Lehies**

**Z = Zeniffite initiative**

**o = Intended action not carried out**

**^ = Multiple battles involved**

**Quality rating for date:**

**<sup>a</sup> = specific month cited (3 occurrences)**

**<sup>b</sup> = commencement or end of year specified or implied (32 occurrences)**

**<sup>c</sup> = plausible inferential basis (11 occurrences)**

### 1. Era: Since Departure from Jerusalem

Action	Text	Dates	Events
1 <sup>LA</sup>	2 Nephi 5:34		Within forty years, Nephites had already had wars and contentions with the Lamanites.
2 <sup>LA</sup>	Jacob 7:24	55–179	Lamanites delight in wars and seek to destroy Nephites continually.
3 <sup>LA</sup>	Enos 1:20	55–179	Enos sees wars in his lifetime; Lamanites continually seek to destroy Nephites.
4 <sup>LA</sup>	Jarom 1:7	179–238	Lamanites come many times against Nephites.
5 <sup>LA</sup>	Omni 1:2–3	ca. 238– 320	Omni fights much against Lamanites; seasons of serious war.
6 <sup>L</sup>	Omni 1:24	ca. 440– 460	A serious war in the days of Benjamin.
7 <sup>L</sup>	Words of Mormon 1:13–14	ca. 440– 460	Lamanites come from land of Nephi; Benjamin's armies beat them back.
8 <sup>NO</sup>	Mosiah 9:1–2	ca. 405	Zeniff and a Nephite army go to land of Nephi to destroy the Lamanites, but do not act.

### 2. Era: Zeniff as King/Since Departure from Jerusalem

Action	Text	Dates	Events
Z1 <sup>L</sup>	Mosiah 9:14	13/ca. 445	Lamanites attack.
Z2 <sup>Z</sup>	Mosiah 9:16–18	13/ca. 445	Nephites counterattack, drive Lamanites out of their land.
Z3 <sup>L</sup>	Mosiah 10:3, 5, 8–10, 19–20	35/ca. 467	Lamanites attack Shilom from Shemlon after twenty-two years of peace, but are driven out.

Z4 <sup>L</sup>	Mosiah 11:16–17	40/ca. 472	Lamanites attack Zeniffite guards.
Z5 <sup>Z</sup>	Mosiah 11:18	40/ca. 472	Noah's army defeats Lamanites.
Z6 <sup>ZO</sup>	Mosiah 18:33	ca. 43/ca. 475	Noah's army pursues Alma's people.
Z7 <sup>L</sup>	Mosiah 19:6–20	ca. 43/ca. 475	Lamanites attack Noah; he flees, dies.
Z8 <sup>L</sup>	Mosiah 20:7–11	ca. 45/ca. 477	Lamanites attack people of Limhi because of stolen maidens.
Z9 <sup>Z</sup>	Mosiah 21:7–8	ca. 46/ca. 478	Limhi and army attack Lamanites and are beaten.
Z10 <sup>Z</sup>	Mosiah 21:11	ca. 46/ca. 478	They renew the fight and suffer much loss.
Z11 <sup>Z</sup>	Mosiah 21:12	ca. 46/ca. 478	And still again, losing once more.
Z12 <sup>LO</sup>	Mosiah 22:15	ca. 53/ca. 485	Lamanite army pursues Limhi's people into the wilderness unsuccessfully.
Z13 <sup>L</sup>	Mosiah 23:25–29	ca. 53/ca. 485	Lamanite army that had chased Limhi enters Helam where Alma and his people dwell.
Z14 <sup>LO</sup>	Mosiah 24:23	ca. 55/ca. 487	Lamanite army pursues Alma's people, but cannot catch them.

### 3. Era: Reign of the Judges

Action	Text	Dates	Events
9 <sup>NvsN</sup>	Alma 2:1	5.I.10– III.30 (= 514)	Contention begins; Amlici strives to be king.
	Alma 2:5–7	IV.1–VI.1	Voice of the people obtained: negative.
	Alma 2:8	VI.5– VII.30	Amlici stirs up followers.
	Alma 2:10	VIII.1– IX.30	Action 10 planned.
	Alma 2:12–14	X.1–XI.25	Mobilization of Amlicites and Nephites.
	Alma 2:15	XI.25–28	Amlicites move from homelands to hill Amnihu.
	Alma 2:17–19	5.XI.29 <sup>b</sup>	Fighting.

10 <sup>L</sup>	Alma 2:27–28	5.XI.30 <sup>b</sup>	Amlicite-Lamanite combined army attempts to reach Zarahemla, but Nephites drive them away.
11 <sup>L</sup>	Alma 3:20–23 Alma 3:25, 27	5.XII. 5–12 <sup>b</sup> XII.30 (+ 5?)	A backup army attacks and is driven off. All these wars commenced and ended in fifth year. Thus ends the year.
SM1 <sup>LvsL</sup>	Alma 24:2	10.	Lamanites attack Anti-Nephi-Lehies.
12 <sup>L</sup>	Alma 16:1 Alma 16:2–3	10.XII.1– 11.II.5 11.II.5–7 <sup>a</sup>	Lamanites prepare, march to target. Attack at Ammonihah and around Noah.
13 <sup>LA</sup>	Alma 25:3	11.II. 7–23 <sup>a</sup>	En route back, Lamanites had many battles.
14 <sup>N</sup>	Alma 16:8 Alma 16:9	11.III.7 <sup>a</sup> XII.30 (+ 5?)	Battle above Manti; captives are recovered. Thus ends the eleventh year.
15 <sup>L</sup>	Alma 16:12	14.	Lamanites come to war this year; no details.
SM2 <sup>LvsL</sup>	Alma 27:2	14.	Lamanites again destroy Anti-Nephi-Lehies.
16 <sup>L</sup>	Alma 27:14  Alma 27:20 Alma 27:21–26  Alma 28:1 Alma 28:2–3  Alma 28:4–6 Alma 28:7	14.XII. 7–21  XII.21–25 15.I.1–II.1  II–X 15.XI. 15–17 <sup>b</sup>  XII.1–30 XII.30 (+ 5?)	Anti-Nephi-Lehies flee to the borders of the land of Zarahemla. Alma, Ammon consult the chief judge. Voice of the people obtained; leaders return; Anti-Nephi-Lehies go to Jershon. They settle, plant, build; Nephite armies placed. Huge battle with Lamanites; tremendous slaughter on both sides. Ritual mourning period. Thus ends the fifteenth year.

17 <sup>Lo</sup>	Alma 35:10	17.X–XII	Zoramites stir up their people and Lamanites against people of Ammon.
	Alma 35:12	XII.30 (+ 5?)	Thus ends the seventeenth year.
	Alma 35:13	18.I–II	Ammonites move to Melek (cf. Alma 43:13), leaving Nephite army in Jershon to contend with Lamanites and Zoramites.
	Alma 43:4, 15, 22	18.II <sup>b</sup>	Nephites prepare for war; Lamanite armies want to attack but do not due to superior Nephite preparations.
18 <sup>L</sup>	Alma 43:22–33	18.III–X	Lamanite redeployment to Manti sector (via land of Nephi homeland?). Moroni spies on them, sends to Alma and receives prophetic assistance, marches to Manti, mobilizes locals, positions his men, waits. Battle; Lamanites defeated.
	Alma 43:35–54	18.XI.25 <sup>b</sup>	
	Alma 44:23	XII.1–15	Nephite armies return to homes.
	Alma 44:24	XII.30 (+ 5?)	Thus ends the eighteenth year.
19 <sup>NvsN</sup>	Alma 45:1	19.I	Fasting, prayer, thankfulness.
	Alma 45:2–18	I.15	Alma charges his son, leaves.
	Alma 45:20–22	I.25– III.25	Helaman preaches, organizes in all the land.
	Alma 46:1–7	III.25– IV.30	Sorting out of sides, arming, Amalickiah's "flattery," and gathering of dissident force.
	Alma 46:12–28	IV.1– IV.30	Moroni rallies the faithful.
	Alma 46:29–33	19. V.1–7 <sup>c</sup>	Amalickiah departs; Moroni and posse pursue, intercept, slay some. Amalickiah escapes.
20 <sup>L</sup>	Alma 47:1–36	19.V.20– VIII.20	Amalickiah gains, consolidates power.

	Alma 48:1–5	VIII.20– X.10	Amalickiah stirs up Lamanites, prepares for war, staffs army with Zoramites.
	Alma 48:8–9	X–XI	Moroni fortifies Nephite sites.
	Alma 49:1	X.10– XI.10	Lamanites on way to Ammonihah.
	Alma 49:3–24	19.XI. 10–15 <sup>b</sup>	Lamanites are defeated at Ammonihah and Noah.
	Alma 49:25	XI.15– XII.15	Lamanites return to land of Nephi.
	Alma 49:29	XII.30 (+ 5?)	Thus ends the nineteenth year.
21 <sup>N</sup>	Alma 50:1–6	20.I–II	Nephites fortify extensively.
	Alma 50:7	20.II. 10–30 <sup>c</sup>	Lamanite squatters driven from east coastal area by Nephite army.
	Alma 50:9–15	III–XII	Settlers installed; Nephites construct cities and fortifications.
	Alma 50:16	XII.30 (+ 5?)	Thus ends the twentieth year.
22 <sup>NvsN</sup>	Alma 50:25	24.II.1– III.15	Contention arises between peoples of Morianton and Lehi; legalistic jousting.
	Alma 50:26–27	III.15– IV.30	A warm contention; former take up arms; Lehi group flees to Moroni.
	Alma 50:28–29	V–XI	Morianton worries, determines to flee to north, sells his people on it.
	Alma 50:33–35	24.XII. 1–20 <sup>b</sup>	Morianton group flees; Moroni pursues; battle occurs.
	Alma 50:36	XII.21–30	Moriantonites returned; lands united.
	Alma 50:40	XII.30 (+ 5?)	Thus ends the twenty-fourth year.
23 <sup>NvsN</sup>	Alma 51:1	25.I–II	Peace.
	Alma 51:2–6	III.1–V.30	Contentions develop; petitions made; sides chosen.
	Alma 51:7	VI.1– VII.30	Voice of the people obtained.



	Alma 51:7	VIII.1– X.1	Political stalemate.
	Alma 51:14	IX.15– XII.1	Lamanite army on the way to east coast.
	Alma 51:15–21	25.IX.30– XI.30 <sup>c</sup>	Moroni receives (emergency or partial?) approval by the voice of the people, subdues rebels.
24 <sup>l</sup>	Alma 51:22–23	25.XII.1 <sup>a</sup>	City of Moroni attacked, taken.
	Alma 51:25–37	XII.5–30 (+ 5?)	Lamanite army advances to near Bountiful. On new year's eve, Teancum slays Amalickiah in his tent on the beach. Lamanites hole up. Thus ends the twenty-fifth year.

The chronology from here to the beginning of the thirtieth year constitutes a revision of the literal dates in Alma 52–58, which contain contradictions likely due to errors of memory by Helaman. The revision is developed in my paper, "The Significance of the Chronological Discrepancy between Alma 53:22 and Alma 56:9," which can be requested from the author at F.A.R.M.S. The revisions do not change any seasonal information.

25 <sup>l</sup>	Alma 52:2	26.II.1– III.15	Ammoron travels to Nephi.
	Alma 52:4–5	III.15– VIII	He consolidates power.
	Alma 52:12–13	26.IX– XI.15 <sup>b</sup>	He raises a new (limited) army and attacks the west sea borders of the Nephites with little success but poses a threat.
	Alma 52:11, 15	XI– 27.I.30	Moroni goes to the west sea front, organizes, recruits, establishes defenses.
26 <sup>NO</sup>	Alma 52:15–17	26.XI– XII <sup>b</sup>	Moroni has instructed Teancum to attack Mulek if possible and has sent some reinforcements, but Teancum lacks a tactical plan. Keeps visibly preparing for attack while fortifying.

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27 <sup>L</sup>	Alma 52:19; 56:13–14	27.X.25– XI.15 <sup>b</sup>	Lamanites capture Manti, Zeezrom, Cumeni, and Antiparah.
28 <sup>LO</sup>	Alma 56:9	XI.15–30	Helaman's two thousand sons march from Melek to Judea.
	Alma 56:10, 18	27.XII– 28.II <sup>b</sup>	They help fortify Judea; Lamanites dare not attack though expected to.
29 <sup>N</sup>	Alma 52:18	27.XI.1– XII.20	Moroni has been recruiting a large army and now leaves Zarahemla for Bountiful to join Teancum.
	Alma 52:19–20	28.I.8–30	Council of captains at Bountiful, then embassies to get Lamanites to come fight.
	Alma 52:21–26	28.II.5–6 <sup>b</sup>	Stratagem leads to recapture of Mulek.
	Alma 53:7	III–XII	Nephites on the east fortify and farm.
30 <sup>LA</sup>	Alma 56:29	II.15	Food, reinforcements arrive at Judea.
	Alma 56:29	28.III.1– VI(?).30 <sup>c</sup>	Lamanites, nervous about increased Nephite strength, sally out to intercept support.
31 <sup>N</sup>	Alma 56:30–34	28."VII" (III?).1–5 <sup>a</sup>	Stratagem carried out near Antiparah to defeat Lamanites.
32 <sup>NO</sup>	Alma 57:3–4	28.X–XI <sup>b</sup>	Helaman prepares to attack Antiparah, but Lamanites abandon it.
	Alma 57:5	XII.30 (+ 5?)	Thus ends the twentieth-eighth year.
33 <sup>N</sup>	Alma 55:7–24	29.II.14– 15 <sup>c</sup>	Gid is recaptured.
	Alma 55:25	II.16– III.15	Lamanite prisoners labor fortifying Gid.
34 <sup>LA</sup>	Alma 55:27	29.III.1– IV.30 <sup>c</sup>	Lamanite tricks, minor attacks to free prisoners fail.
35 <sup>N</sup>	Alma 57:6	II	Supplies, six thousand more men reach Helaman.
	Alma 57:8–12	29.II.15– III.30 <sup>b</sup>	Helaman's army besieges Cumeni; Lamanites surrender.

	Alma 57:13–16	IV.1–14	Large number of prisoners create a dilemma; they are sent toward Zarahemla.
36 <sup>L</sup>	Alma 57:17–22	29.IV.15 <sup>b</sup>	New Lamanite army attacks, but is defeated, retreats to Manti.
37 <sup>NO LO</sup>	Alma 58:1–2	29.V <sup>c</sup>	Stalemate at Manti, but tactical tricks by both sides tried with no real battle; Lamanites will not come out to fight.
	Alma 58:3–4	V–X	Helaman waits for food and men.
	Alma 58:5	V–X	Lamanites being reinforced and supplied.
	Alma 58:8	XI.1	Helaman receives some food, a few men.
38 <sup>N</sup>	Alma 58:10–30	29.XI.20– 21 <sup>b</sup>	Operation at Manti captures the city; Lamanites flee to the land of Nephi.
	Alma 58:41	XII.1	Helaman writes, sends his epistle.
39 <sup>NO</sup>	Alma 55:33–34	XI–XII	Lamanites fortify Morianton, bring in supplies, men.
	Alma 55:33	29.XII. 15–30 <sup>b</sup>	Moroni prepares to attack Morianton.
	Alma 55:35	XII. 30(+ 5?)	Thus ends the twenty-ninth year.
	Alma 59:5	30.I <sup>c</sup>	Moroni continues preparation.
40 <sup>NvsN</sup>	Alma 61:5, 8	30.I.15 <sup>b</sup>	Rebels in Zarahemla drive out Pahoran to Gideon; write to Lamanite king.
41 <sup>L</sup>	Alma 59:5–8	30.I.25 <sup>b</sup>	Lamanites, including some from Manti, attack, capture Nephiah.
42 <sup>NvsN</sup>	Alma 62:3–6	III–V	Epistles having been exchanged in the wake of action 41, Moroni goes to Pahoran, recruiting as he goes.
	Alma 62:6	VI–X	In Gideon, loyalist forces are gathered, consolidated, armed.
	Alma 62:7–8	30.XI <sup>b</sup>	Moroni and Pahoran lead army against the king-men under Pachus, defeat them.

	Alma 62:9–11	XII	The disloyal receive trials; government functions are restored. Thus ends the thirtieth year.
43 <sup>N</sup>	Alma 62:14–15	31.I.30– II.25 <sup>b</sup>	Moroni leads a large army toward Nephihah. En route, they encounter a Lamanite force headed to Nephihah, capture them.
44 <sup>N</sup>	Alma 62:18–29	31. II.27– 30 <sup>b</sup>	Nephites take back Nephihah and pack prisoners off to Melek.
45 <sup>N</sup>	Alma 62:30–38	31.III.1–2 <sup>b</sup>	Nephites attack Lehi, driving Lamanites to the city of Moroni, then out of the land.
	Alma 62:39	XII.30 (+ 5?)	Thus ends the thirty-first year.
46 <sup>L</sup>	Alma 63:10–15	39.XI? <sup>c</sup>	During the year, the chief judge dies, dissenters go to Lamanites and stir them up. They come against the Nephites.
	Alma 63:16	XII. 30(+ 5?)	Thus ends the thirty-ninth year.
47 <sup>LA</sup>	Helaman 1:14	41.I–X	Lamanites gather a well-armed, innumerable army.
	Helaman 1:15–34	41.XI–XII <sup>b</sup>	Lamanites come down, led by Coriantumr, take Zarahemla, and go through the center of the land toward Bountiful. But they are headed off, retreat, and are decimated. Thus ends the forty-first year.
48 <sup>NvsNA</sup>	Helaman 3:17–22	46–48	Great contentions and wars among the Nephites. Thus ends the forty-sixth year. In the latter end of the forty-eighth year, the wars and contentions begin to diminish a small degree.
49 <sup>NvsN</sup>	Helaman 4:1–2	54	Contention among the Nephites with much bloodshed; rebels are slain or driven out to Lamanite lands.

50 <sup>LA</sup>	Helaman 4:4 Helaman 4:5–6	56 57	Dissenters and Lamanite armies prepare for war. Dissenters and Lamanite armies come down, possess Zarahemla, and drive Nephites near to the land Bountiful.
51 <sup>L</sup>	Helaman 4:8	58–59	Nephites are driven entirely out of the land southward.
52 <sup>NA</sup>	Helaman 4:9	60	Nephites regain many parts of land.
53 <sup>NA</sup>	Helaman 4:10, 17	61	Nephites regain half their possessions. Thus ends the sixty-first year.
54 <sup>NA</sup>	Helaman 4:18	62	Nephites try but fail to gain more.
55 <sup>NvsNA</sup>	Helaman 11:1–2	72–73	Robbers cause a war that goes on all year and through the next.
56 <sup>NvsNA</sup>	Helaman 11:24–25	80	Dissenters, robbers war with Nephites, retreat to wilderness and mountains after murdering and plundering.
57 <sup>NvsN</sup>	Helaman 11:28–29	80.XI(?)	Nephites send an army to search for robbers, but it is driven back. Thus ends the eightieth year.
58 <sup>NvsN</sup>	Helaman 11:30–32	81.I–II <sup>b</sup>	At the beginning of the year, Nephites go against robbers and destroy many, but must return to their own lands because of robbers' numbers. Thus ends the eighty-first year.
59 <sup>NvsN</sup>	3 Nephi 1:27	93	During the year, Gadianton robber bands living in the mountains slaughter many.

#### 4. Era: Sign of Christ's Birth

Action	Text	Dates	Events
60 <sup>NvsNA</sup>	3 Nephi 2:11–19	13–15	There begin to be wars through all the land. Before the thirteenth year has passed away, this war threatens Nephites with destruction. It continues for two years.

61 <sup>NvaN</sup>	3 Nephi 3:1, 13-26	16-17	In these years, the people gather in one place to starve out robbers.
	3 Nephi 4:7-12	19. "VI" (?) <sup>a</sup>	In the nineteenth year, "sixth month," robbers battle Nephites, but are beaten and eliminated.
62 <sup>LA</sup>	Mormon 1:8-12	322	In this year a war with multiple battles begins; Lamanites withdraw.
63 <sup>L</sup>	Mormon 2:1	326	A new war begins.
64 <sup>L</sup>	Mormon 2:3	327	Lamanites come against the Nephites, who retreat northward.
65 <sup>L</sup>	Mormon 2:4	327-330	Unsuccessful stand at Angola.
66 <sup>L</sup>	Mormon 2:5	327-330	Unsuccessful stand in land of David.
67 <sup>L</sup>	Mormon 2:9	327-330	At Joshua, Nephites defeat the Lamanites.
68 <sup>LA</sup>	Mormon 2:15	?-344	Implied slaughter of Nephites in wars.
69 <sup>L</sup>	Mormon 2:16	345	Nephites driven into the land northward to Jashon.
70 <sup>L</sup>	Mormon 2:20	345	Driven northward to land of Shem.
71 <sup>L</sup>	Mormon 2:22-25	346	Nephites defeat Lamanites.
72 <sup>NA</sup>	Mormon 2:27	347-349	Nephites attack, regain their old lands.
73 <sup>L</sup>	Mormon 3:4-7	361	Lamanites attack at the narrow pass, are beaten, and flee to their own lands.
74 <sup>L</sup>	Mormon 3:8	362	Lamanites return and are again beaten.
75 <sup>N</sup>	Mormon 4:1-2	363	Nephites attack Lamanites, then retreat to land of Desolation.
76 <sup>L</sup>	Mormon 4:2	363	Immediately a new Lamanite army arrives and beats Nephites, taking land of Desolation.

77 <sup>L</sup>	Mormon 4:7–8	364	Lamanites come against the city Teancum, but they are repelled.
78 <sup>N</sup>	Mormon 4:8	364	Confident Nephites retake land of Desolation.
79 <sup>L</sup>	Mormon 4:10–14	367.1?	The 366th year has passed away, and Lamanites come again, taking possession of lands of Desolation and Teancum.
80 <sup>N</sup>	Mormon 4:15	367	Nephites drive out the Lamanites once more.
81 <sup>LA</sup>	Mormon 4:17–20	377	Lamanites mercilessly drive Nephites; in land of Desolation, Nephites lose and flee.
82 <sup>LA</sup>	Mormon 4:20	378?	At Boaz, the Lamanites must attack twice to win.
83 <sup>LA</sup>	Mormon 5:3–4	379	Two Lamanite attacks at Jordan fail.
84 <sup>L</sup>	Mormon 5:6–7	380	Nephites are beaten badly and flee.
85 <sup>L</sup>	Mormon 6:5–15	384	The final battle at Cumorah; tens of thousands destroyed; Nephites become extinct as a nation and people.

### Notes

1. The actual length of the solar year varies periodically between 365.242120 and 365.242877 days according to Leroy E. Doggett and George H. Kaplan, "Calendar Accuracy," *Sky and Telescope* 65 (1983): 205–6. Astronomically, the solar year's average length over a five-million-year period is about half a minute shorter than our Gregorian year.

2. Charles Kolb in Michel Graulich, "The Metaphor of the Day in Ancient Mexican Myth and Ritual," *Current Anthropology* 22 (1981): 53. Pages 51–59 present information on the hotly debated subject of whether Mesoamerican calendars included intercalation mechanisms. Victoria Bricker, "The Origin of the Maya Solar Calendar," *Current Anthropology* 23 (1982): 101–3, has proposed that the southern Mesoamerican calendar did not adjust to keep seasons and calendar days in agreement. From a Book of Mormon point of view, it may be of interest that she calculates that the Maya solar calendar was first used "around 550 B.C.," at which time the seasons and the



solar year would have been in full coordination. At that time 06 Pop, first day of the first month of the Maya year, fell at the winter solstice. Of course Lehi's party reached their land of promise, probably in southern Mesoamerica, around 585 B.C., although we do not know what relation his descendants may have had to the bearers of higher Maya culture.

3. Useful basic sources include Jack Finegan, *Handbook of Biblical Chronology: Principles of Time Reckoning in the Ancient World and Problems of Chronology in the Bible* (Princeton: Princeton University Press, 1964); and Julian Morgenstern's trilogy, "The Three Calendars of Ancient Israel," *Hebrew Union College Annual* 2 (1924): 13–78; "Additional Notes on 'The Three Calendars of Ancient Israel,'" *Hebrew Union College Annual* 3 (1926): 77–107; and "Supplementary Studies in the Calendars of Ancient Israel," *Hebrew Union College Annual* 10 (1935): 1–149. A similarity may have prevailed between the Near East and Mesoamerica in beliefs and customs regarding the beginning of the new year. The unlucky or "useless" days of the Aztecs and Maya immediately preceding the new year were a time of psychological tension and ritual uncertainty in the face of a possibility that the hoped-for renewal of the world at the moment of initiation of the new time period somehow might fail to take place (see, for example, George C. Vaillant, *The Aztecs of Mexico* [Harmondsworth, England: Penguin, 1950]). The similar five-day period in Egypt had some of the same connotations. Julian Morgenstern, in his *The Fire upon the Altar* (Chicago: Quadrangle, 1963), 6–49, argues passionately, if not with complete persuasiveness, that similar beliefs and practices surrounded the Israelite new year celebration at the fall (changed later to the spring) equinox.

4. Morgenstern, "Supplementary Studies," 3.

5. *Ibid.*, 7.

6. See John L. Sorenson, "The 'Brass Plates' and Biblical Scholarship," *Dialogue* 10 (1977): 34; also available as a F.A.R.M.S. Reprint, 1977.

7. Morgenstern, "Additional Notes," 101.

8. I consider it obvious that, at the very least, two calendars were in use among the Nephites, if only because the lunar system indicated for the people of Zarahemla would not have disappeared, considering how numerous they were in the Nephite-ruled society. We should also expect that at the least the Israelite immigrants would adapt or borrow, as did the Elephantine group in Egypt, a local, ecologically suited system of reckoning to govern their agricultural cycle. After all, whoever made them acquainted with native Amer-

ican maize (see Mosiah 7:22; 9:9, 14) could not have made the transfer of the plant and the essential cultural knowledge of its husbandry without also sharing an appropriate calendar with the newcomers (on maize transmission, see John L. Sorenson, *An Ancient American Setting for the Book of Mormon* [Salt Lake City: Deseret Book and F.A.R.M.S., 1985], 139–40). Mesoamerica is, of course, famous for the number, variety, and complex articulation of its calendrical systems (see, for example, Linton Satterthwaite, "Calendrics of the Maya Lowlands," in Gordon R. Willey, ed., *Handbook of Middle American Indians*, 16 vols. [Austin: University of Texas Press, 1965], 3:603–31).

9. Ralph L. Roys, "Lowland Maya Native Society at Spanish Contact," in Willey, *Middle American Indians*, 3:671.

10. A good source showing the time depth of solstitial reckoning is Vincent H. Malmstrom, "A Reconstruction of the Chronology of Mesoamerican Calendrical Systems," *Journal for the History of Astronomy* 9 (1978): 105–16.

11. John L. Sorenson, "The Significance of the Chronological Discrepancy between Alma 53:22 and Alma 56:9," available from the author upon request at F.A.R.M.S.

12. Sorenson, *Ancient American Setting*, 35, 241.

13. Jorge Vivó Escoto, "Weather and Climate of Mexico and Central America," in Robert C. West, ed., *Handbook of Middle American Indians*, 16 vols. (Austin: University of Texas Press, 1964), 1:187–215. On rainfall in the Motozintla area, see Carlos Navarrete, *Un Reconocimiento de la Sierra Madre de Chiapas: Apuntes de un Diario de Campo*, Universidad Nacional Autónoma de México Centro de Estudios Mayas, Cuadernos 13 (Mexico, 1978).

14. Mesoamerican battles were sometimes scheduled for auspicious times (Michael D. Coe, "Skywatchers of Ancient Mexico," *Archaeoastronomy* 4/1 [1981]: 39–40).

15. Finegan, *Handbook of Biblical Chronology*, 298–301.

16. In regard to the calendar in the new reckoning, 3 Nephi 8 forces me to reconsider a position I had previously taken. On the fourth day of the first month in the thirty-fourth year of the new era, the prophesied signs of the crucifixion began with the rise of a great storm and a "tempest" (3 Nephi 8:5–7). I suggested in *An Ancient American Setting*, 322, that this referred to a tropical hurricane, but the season when hurricanes have occurred historically falls only between June and November. A hurricane would have been absolutely impossible, on natural principles, whether the old late-December new year had been referred to here or, as I now

suppose, the new year fell over three months later. Rereading the text persuades me now that a hurricane probably was not referred to. The tempest, after all, arose abruptly, then ended after only three hours (see 3 Nephi 8:6, 19). This does not describe a typical hurricane coming out of the Caribbean. Something more like a set of super thunderstorms triggered by volcanism could account for the reported phenomena. Such thunderstorms would be quite possible in April.