

THE BIBLICAL BASIS OF THE SACRED CALENDAR

Part Two: The Sacred Calendar in the New Testament

Few historical problems are more tangled than that of the sacred calendar in Jesus' day. We can attempt to untie this "Gordian knot" based solely on the historical evidence, and fail. Or we can use the "sword of the Spirit, which is the Word of God" (Ephesians 6:17), and cut through to the correct solution to the problem!

TWO INCOMPATIBLE CALENDARS

Supposedly, "The history of the Jewish calendar may be divided into three periods -- the Biblical, the Talmudic, and the post-Talmudic. The first rested purely on the observation of the sun and the moon, the second on observation and reckoning, the third entirely on reckoning."¹

But the Bible describes (in principle) a calendar much different from that used by the Pharisees and Rabbis. The *biblical* calendar -- the calendar which God intended man to use from the beginning, as adapted to Israel's needs -- was based on a *hierarchy of astronomical cycles* which determined "signs, appointed times, days and years". It took into account the relationship of noon to sunset on a round earth, as well as the geography of the earth's land masses. It also took into account the starting points of the daily and weekly cycles (Day One of Creation Week) and of the monthly, seasonal, yearly and precessional cycles (Day Four of Creation Week). It made adjustments to the timing of the fall Holy Days (especially Atonement) relative to the weekly Sabbath. Finally, it correlated the 19-year lunisolar cycle with the Sabbatical Year and Jubilee cycles over a period of 950 years.

In effect, the biblical calendar began its months (all else being equal) on the date of the *mean* conjunction of the sun and moon (the *molad*). It geared the dates of its Festivals to the *mean* dates of the new and full moons, all determined from a single referent (the date of Tishri 1). It had a *regular* system for determining the lengths of the months and years, a *regular* system of determining "leap years", and a *regular* system of "postponements" to the date of Tishri 1. Finally, it was based on *calculation* as originally fixed after many years of observation (thus taking into account the irregularities of the motions of the sun and moon), and was reckoned according to *world time* (as based on the concept of a "date line" far to the east of Jerusalem). All this is *dictated* by the application of particular principles in a particular order.

¹ "Calendar, History Of ", *Jewish Encyclopedia*, p. 498.

This calendar would have been used by Israel's priests from the days of Moses onward (cf. Exodus 12:1-2); and it would have been transmitted *accurately* down to Second Temple times. Throughout its history, it would have been in all essentials the same as the calendar we use in God's Church today. This is because our calendar applies the *correct biblical principles* in the *correct order* -- and because the biblical calendar always would have followed the *same principles* in the *same order*. This procedure would always have led to the *same essential results*, with adjustments being made according to the needs of the time.²

This *theoretical* calendar allowed David, Jonathan and Saul to predict with *certainty* the first day of each month (1 Samuel 20:5, 18, 24-27). Had David met Jonathan at night when the new crescent was visible, he could not have said, "Tomorrow (*machar*) is the new moon". (Remember, in Israel days began at sunset.) Besides, David could not have deduced from simple observation how many days would fall between one new crescent and another, unless 29 days had already passed from the appearance of the last new crescent. In that case, the 30th day automatically would have been the "new moon". But would a hunted man (even a former shepherd, one familiar with the skies) have automatically counted the number of days correctly? Or would he have inadvertently risked the wrath of Saul (who was used to "sitting at meat" on the "new moon") by possibly missing the first thin new crescent when it appeared? Isn't the simplest explanation of this simple statement rather that the dates of the "new moons" were *fixed* according to some established scheme, then *officially published* (orally or in writing) so that everyone would know when they were?

Given the *sound astronomical theory* described in Genesis 1:14, Israel must have had a *fixed calendar* from very early times -- just as did other ancient nations.³ In any case, since the "signs" of Genesis 1:14 point to the *mean conjunction* of the sun and moon, not the new crescent, as marking the "new moon" (all else being equal), the "new moons" in ancient Israel would have been based on the calculation of the *molad*, not on the observation of the new crescent. Again, this demands that ancient Israel had a fixed calendar, not merely a "rough" calendar based on observation.

² Of course, all this presumes that the solar year was not (at least from Moses' time forward) exactly equal to 12 lunar months, and that the relationship between the two was essentially the same then as now. The commands regarding the timing of Passover and Tabernacles (cf. *Part One* of this series) imply that this was the case. This is verified by the records of the Chinese calendar (almost as old as the Hebrew calendar in terms of its benchmark), which was likewise based on a 19-year cycle of common (12-month) and leap (13-month) years.

³ Interestingly enough, Ben Sira (in Ecclesiasticus 47:10, Sir Brenton's versification) writes that "[David] beautified [Israel's] feasts, and set in order the solemn times until the end..." (Sir Lancelot C. L. Brenton, *The Septuagint with Apocrypha: Greek and English*, Hendrickson, 1986). This implies that David was responsible for the fixed calendar, an idea that appears well after Ben Sira's time as the justification for a complex cycle of 1176 years promoted by Rabbi Abbahu (c. 300 A.D.) (cf. "Calendar", *Encyclopedia Judaica*, col. 49).

The Pharisaic calendar, by contrast, was *empirical* (i.e., based on observation apart from astronomical theory). It began its months (all else being equal) on the date of the *new crescent* (always at least one local calendar day after the date of the *molad*). It geared the dates of the Festivals to the dates of the *approximate* new and full moons, as determined *month by month*. The lengths of its months and years, the timing of its "leap years", and the application of its "postponements" to Tishri 1 were all more or less *irregular*. Finally, it was based on observation as checked by calculation (rather ineffectively, due to the irregularities of the motions of the sun and moon), and was reckoned according to *local Jerusalem time*.

RECONCILING THE IRRECONCILABLE

Ancient and modern Jewish sources, seeking to uphold the authority of both the received (i.e., the biblical) calendar and the Pharisaic calendar, attempt to *reconcile the irreconcilable*. They point to *overlaps* in the results of the two calendars as proof of their *essential identity* and *equal authority*. Had they understood the real implications of the Scriptures, they would have realized that the Pharisaic calendar has *no biblical authority*. As it is, many Jewish, Christian and secular scholars (and many in God's Church, ministers and members) have been confused by the "doublethink" behind the Jewish commentaries on the calendar.⁴

Yet the biblical and Pharisaic calendars are *inherently incompatible*. Their results sometimes overlap; but this is a matter of coincidence, not of intent. Both could not have been in use at the same time in Jesus' day, else the Jews would have been divided among themselves as to when to keep the Holy Days. Yet we see Jesus, His disciples, and the Jews keeping the same Holy Days at the same time, all the way through the New Testament.

JESUS, THE CHURCH AND THE CALENDAR

So which method did Jesus and the early Church use to calculate the Holy Days? Did they follow the reckoning of the Pharisees, merely because "the scribes and the Pharisees [sat] on Moses' seat" (Matthew 23:1-3)?⁵ Or did they

⁴ Even Raymond McNair, in his articles on the calendar for the July-August 1996 *Global Church News*, was "duped" by the Judaic "party line" on this issue. For example, he writes (p. 5): "All who are familiar with the Jewish calendar also know that from ancient times, the Jews always began each month with the observable new crescent moon -- not with the astronomical New Moon (also called "dark moon")." Yet he upholds the authority of the Hebrew calendar as used by God's Church, which does begin the month (all else being equal) with the *molad* -- never with the new crescent. So he points to the "coincidences" of dates set by our calendar and that of the Pharisee-led Sanhedrin as proof of the essential equality of the calendars (p. 16).

⁵ Jesus' statement has been much debated as to its intent. Apparently the scribes and Pharisees, like Moses before them (Exodus 18:13-16; Numbers 9:6-14), judged in legal disputes regarding the *civil* application of

"obey God rather than man" (Acts 5:29) and follow a calendar based on *biblical principles*: the *priestly* calendar used in the Temple, in all essentials (as we will see) the same as God's Church follows today?⁶

We know that Jesus and His disciples kept the Festivals and Holy Days on the same days on which all "orthodox" Jews kept them (the Passover being a *special case* -- the proof of which deserves a separate article). We also know that different sects of Judaism had various calendars (some of which were not even lunisolar). The New Testament records no criticism by Jesus of any sect on calendrical matters. Galatians 4:8-10 and Colossians 2:16-17 apparently deal with (among other things) calendars claiming to be "God-inspired" but which really *enslaved* people to "the elements of the world". But the "calendar issue" was at best a *secondary* matter to Jesus and the apostolic Church of God.

But we also know that at least part of the *Temple priesthood* (whatever other faults it had) would have preserved the calendar correctly. Jesus and His disciples would have followed this calendar, not any sectarian calendar. We know that the priestly calendar would have been in force so long as the Temple was standing (that is, before 70 A.D.). The Sadducee priests, not the Pharisees, led the Sanhedrin its efforts against Jesus and His apostles -- which certainly proves *who was in charge* of religious matters at that time.

We need to remember that the Sanhedrin (the highest civil and religious court in Judea) found its ultimate roots in Deuteronomy 17:8-13, which laid out the procedure for trying cases too difficult to decide at the local level. In effect, the highest court of ancient Israel consisted of three parts:

- 1) The Aaronic high priest (verse 12);
- 2) The priests and Levites (verse 9);
- 3) The chief civil judge (verses 9 and 12).

After the time of the Book of Judges, the role of chief judge passed to the king and (by extension) his princes and officers (cf. 2 Samuel 8:15; 15:1-6; etc.). In Nehemiah's day, when there was no king any longer, the role of chief civil judge was held by the governor. Notice that Nehemiah the governor, Ezra the priest

the Law. But the priests and Levites (beginning with Aaron and the Levites of his day) were commissioned of God to teach the Law in its *spiritual* sense and to conduct the worship in the sanctuary (Deuteronomy 33:10; Malachi 2:4-9).

⁶ This is not to ignore the fact that even the priestly Sadducees and Boethusians erred on certain fine points of biblical law relative to the calendar. These have duly been corrected in God's Church under the leadership of Herbert W. Armstrong (with the assistance of men such as Herman Hoeh, John Kossey and Ken Herrmann).

and the Levitical teachers instructed all the people on how to observe the Feast of Trumpets correctly (Nehemiah 8:9-12).

After the Maccabean revolt, the role of chief civil judge was held by the Maccabean priest-king. When the last Maccabean priest-king died, the Pharisees (according to Josephus) inherited everything "pertaining to the kingdom". They, with the priests and Levites and the high priestly family, formed the Sanhedrin of Jesus' day.

Just as Moses sat before all the people so long ago, hearing their most difficult civil cases and rendering judgments based on God's laws (Exodus 18:13-26), so the scribes and Pharisees of Jesus' day "sat in Moses' seat" in civil matters. By this time -- in large measure, no doubt, due to the materialist skepticism of the Sadducee party (cf. Acts 23:6-10) -- the Pharisees already had their "traditions of the elders": civil judgments with ceremonial implications (Mark 7:1-5), or even with moral implications (7:6-13), usurping in part the prerogatives of their Levitical and priestly brethren. Their concern was with transmitting these judgments (the so-called "Oral Law") to the masses of the people. Jesus rightly castigated many of these "traditions" as nullifying the Word of God (the "Written Law", as the Pharisees sometimes called it). Yet this reality did not nullify the requirement (in principle) that the people do what the scribes and Pharisees commanded them to do in civil matters (Matthew 23:1-3; cf. Deuteronomy 17:10-13).

What was to be done in things pertaining to *Temple observance* was another matter entirely. This was the jealously-guarded prerogative of the priests and Levites, and not even the Pharisees (so insistent on the sanctity of the Torah themselves) would have dared to go so far as to usurp it (cf. Numbers 16:1-18:7). Whatever the Pharisees might have tried to enforce *outside* the Temple courts in matters of worship, they had no power to enforce anything *within* them. Thus, the calendar followed by the priesthood -- and therefore by everyone who came to worship in the Temple, *including pilgrims from all over the known world* (who needed to have a *pre-established calendar* in order to *time their arrival*) -- would have followed biblical principles as the priests, not as the Pharisees, understood them.

Again, the priestly calendar would have been in all essentials the same as our own, because it would have applied the *same biblical principles* in the *same order* - including the *long-secret calculations* that remain behind our own calendar. These calculations (especially of the mean length of the lunar month) are *accurate*, compared to the astronomical cycles they represent.⁷ So some critics

⁷ "The deviation from the true astronomical figure is very slight [a matter of half a second per month!] as far as the lunar month is concerned...The difference between the traditional length of the [solar] year and the

notwithstanding, we can reliably extrapolate both our sacred calendar and modern astronomy into the past to discover whether the *biblical* or the *Pharisaic* calendar was used in Jesus' day.

PONDERING THE IMPONDERABLE

Raymond F. McNair (writing for the now-defunct Global Church of God) stated: "Some say that by using certain *astronomical calculations* we can actually determine the exact position of the phases of the moon for past years -- including the year of Jesus Christ's crucifixion. Others, however, don't believe astronomical calculations are totally reliable. They claim there are *too many imponderables* in regard to the use of astronomical tables to know *precisely* the time of day on which the astronomical new moon ... occurred in 31 A.D., the year of Christ's crucifixion -- or the precise hour when the new crescent moon appeared on either Tishri 1 or Nisan or Abib 1 of that same year. Such astronomical calculations, intended to prove the use of postponements in Christ's time, appear to be unreliable!" (*Global Church News*, July-August 1996, p. 21).

What are some of these "imponderables"? For one, the very slight (but irregular) change in the rotation of the earth, due to motions in the earth's core, seasonal and other weather changes (such as *El Nino* and *La Nina*), tides, perturbations and even solar flares. This leads over time to an increasing discrepancy between extrapolations of *Universal Time* (based on the rotation of the earth as measured at Greenwich) and *Ephemeris Time* (in practice, based on very accurate measurements of the moon's motions against the stars). Other "imponderables" might include cyclical or even chaotic changes in the orbits of the moon around the earth or the earth around the sun. In other words, time as reckoned by the rotation of the earth and time as reckoned by the revolutions of the earth, moon and planets become "out of sync". Obviously, since the sacred calendar depends on the synchronization of these astronomical cycles, we cannot simply extrapolate current measurements of heavenly motions into the past.

But those who led Mr. McNair to doubt the reliability of astronomical calculations forgot one thing: accurate astronomy and time-keeping did *not* begin in the 20th century! We have records of various astronomical phenomena dating back as far as *3,000 years*, which we can correlate *theoretically* with current measurements of the motions, masses and interrelationships of the sun and

respective astronomical figure...is, however, not negligible [8 min. 39.4 seconds per year] and causes the Hebrew months to advance against the sun approximately 4½ days in a thousand years. For example, we celebrate [Passover] 4½ days later, on the average, than our ancestors did 1000 years ago at the time of Saadia Gaon [when the Jewish calendar was "fixed" in all respects as it is today]." (This is one reason why the leap year cycle of the sacred calendar must be adjusted from time to time.) Arthur Spier, *The Comprehensive Hebrew Calendar*, 3rd edition revised (Feldheim Publishers, 1986), p. 22.

planets. Of these records, those concerning solar and lunar eclipses (dating back to about 700 B.C.) are most critical for the subject of the sacred calendar.

First, we should understand that Ephemeris Time (now superseded in practice by other systems of time-keeping) "was the reference scale used for comparison with rotational time [Universal Time] to determine variations in the Earth's rotational speed from *about 700 BC to AD 1955*" ("Ephemeris Time", *Encyclopedia Britannica*, 15th ed., Vol. 4, p. 517).

How was this comparison made? By referring to *accurate ancient records* of lunar and solar eclipses (which are included among the heavenly "signs" of Genesis 1:14), such as the solar eclipse of April 15, 136 BC, visible over Babylon. Such records "help astronomers calculate exactly how fast Earth is slowing. If the length of the day were constant, present-day calculations show that you would have had to be at least 2,500 miles from Babylon to see the total solar eclipse of April 15, 136 BC, but it was seen in Babylon, according to two tablets now in the British Museum..." (Barry Evans, *The Wrong-Way Comet and Other Mysteries of the Solar System*, TAB Books, pp. 69-70).

Thanks to records such as these, astronomers can introduce *systematic corrections* into their calculations of past astronomical positions. Even planetarium programs for the personal computer (such as *Voyager II™* for the Macintosh, which was used in researching this article) can *accurately* portray the skies and the timing of astronomical events in late biblical times. The margin of error in such programs' calculations for Jesus' day is very small - enabling one to reliably correct the timing of astronomical events. In addition, the *Voyager II™* program at least contains tables of *ephemerides* (astronomical events such as solar and lunar eclipses) which are even more accurate than the program can calculate, coming as they do from the U.S. Naval Observatory (the most accurate source available).⁸ Finally, the rules of our received calendar, once adjusted according to astronomical and historical data, can accurately determine the *dates* that the biblical (in all essentials, the priestly) calendar would have set in Jesus' day. At no time in Jesus' ministry is there any question of a calendrical or astronomical extrapolation being "off" enough to affect the outcome for calendrical purposes. (It is not a question of the *exact time* being necessary; accuracy to the *calendar day* is sufficient, and the actual margin for error is a matter of minutes at most.)

⁸ One feature of the ancient records which is not taken into account by most astronomers is the *nutiation* ("wobbling") of the earth's axis, as allegedly documented by ancient measurements of the sun's position at noon. According to the late creationist astronomer George Dodwell, these records point to a massive shift in earth's tilt about the time of the biblical Flood. Cf. Paul D. Ackerman, *It's a Young Earth After All: Exciting Evidences for Recent Creation* (Baker Book House, 1986), pp. 88-96. However, by Jesus' day the earth's tilt apparently had stabilized enough to be negligible for our purposes here.

RECKONING WITH RECKONINGS

With our faith in the *stability* of God's heavenly ordinances restored (Psalm 148:1-6), let us return to the foundation of knowledge (the Bible) and its historical and astronomical context.

The key to understanding the calendar as used in Jesus' day is the dating of Jesus' ministry and crucifixion. Herman L. Hoeh summarized much of this evidence in a booklet entitled *The Crucifixion Was Not on Friday* (Worldwide Church of God, 1979 edition). In this booklet, Dr. Hoeh refers to unspecified "astronomical tablets containing more than a dozen precise records of eclipses", and "business documents" dating from the time of King Artaxerxes I, which establish the first year of Artaxerxes as reckoned by the Persians and by the Jews. What are these unspecified records?

According to private correspondence from the Associates for Biblical Research, the "business documents" to which Dr. Hoeh refers are the famous Elephantine papyri. At this writing, I do not have access to any source that documents their contents. However, in *Babylonian Chronology, 626 B.C. to A.D. 75* (Brown University Press, 1956), Parker and Dubberstein published the date of every "new moon" (in this case, the *new crescent*) from Nisan of 626 B.C. to Adar of 76 A.D. The original tablets on which these dates are based are among the records to which Dr. Hoeh refers, and among those which allowed the coordination of Ephemeris and Universal Time.

Artaxerxes' first year extended (in the Persian spring-to-spring reckoning) from approximately "April, 464 to April, 463 B.C." (Hoeh, *Crucifixion*, p. 10). (The first month of the Persian year was actually the equivalent of Nisan in the Hebrew calendar.) According to the fall-to-fall reckoning used by the Jews of the time, Artaxerxes' first year was about "September, 464, to September, 463 B.C." (*ibid.*) --actually, from Tishri 464 to Tishri 463 B.C.

BEING CIVIL ABOUT SACRED YEARS

Some are troubled by the use of Tishri 1 as the "benchmark" for the sacred year (which begins in Abib or Nisan, six months earlier). At this point, let us digress to the matter of "civil" and "sacred years".

By comparing the biblical chronology with that given in the above Babylonian records and others, we know that the Jews reckoned not only the reigns of their own kings, but the reigns of *foreign* kings, from Tishri 1 to Tishri 1 -- not Nisan or Abib 1 to Nisan or Abib 1. They still did so as late as Ezra's time and afterward, long after the ruling House of David departed from Judah. So

from at least the time of the last kings of Judah, the Jews observed a sacred year (beginning in Nisan, as the Bible commands) and a civil year (beginning with Tishri 1). Judaism preserves this distinction by calling Tishri 1 "New Year's Day" (even though its sacred year, like ours in the Church of God, begins with Nisan or Abib 1). Yet the Talmud insists (cf. *Rosh ha-Shanah* 1a, etc.) that the years of kings were always reckoned spring-to-spring -- an assertion *denied* by the Bible and history.

Note too that the original Hebrew of Exodus 12:1-2 (in the Masoretic Text, with its "musical accents") shows that God had made a *revolutionary change* in how Israel was to reckon the beginning of the year. This is consistent with Israel's use of a fall-to-fall reckoning for all occasions, prior to the Exodus (as indicated by what Genesis 1 reveals about the calendar).⁹ After the Exodus, though, Israel apparently began its sacred year in the spring and its civil year in the fall.¹⁰

In any case, the sacred calendar God preserved through the Jews begins with Nisan or Abib 1, but is calculated from the date of Tishri 1 (as is consistent with Genesis 1:14 and other verses). We have no biblical authority for any other way of correlating the sacred and civil years.¹¹

COUNTING "WEEKS" OF YEARS

Now let us return to the reign of Artaxerxes. According to Ezra 7, Artaxerxes issued a decree to rebuild Jerusalem in the seventh year of his reign. Since the Book of Ezra is a Jewish document, it must reckon *civil* years fall-to-fall and *sacred* years spring-to-spring. Thus Ezra "came to Jerusalem in the fifth month [of the sacred year]; this was the seventh [civil] year to the king" (Ezra 7:8, literal translation).

Daniel 9:24-26 reveals that there would be 69 prophetic "weeks" of years (or 483 calendar years) "from (Hebrew min) the going forth of the commandment

⁹ Note God's comments to Abraham regarding the timing of Isaac's conception and birth: "At the *time appointed* [*mo`ed*] I will return unto thee, according to the time of life [in the spring], and Sarah shall have a son" (Genesis 18:14, KJV). They are consistent with the use of a lunisolar calendar by Abraham. Since Abraham (according to Josephus) was a master astronomer, he would have been able to base his calendar on calculation, not merely observation.

¹⁰ Did Israel (as some allege) borrow a fall-to-fall reckoning from the Egyptians? No, because the Egyptians themselves did not observe a fall-to-fall year! Egypt aligned its calendar with the summer solstice and the helical rising of Sirius (which occurred at about the same time), and with the rise of the Nile (which begins in June and reaches its peak only by September). Moreover, their calendar as a whole was solar, not lunisolar as is the biblical calendar; and it certainly never used intercalation.

¹¹ The Mesopotamians, for their part, observed a spring-to-spring year (because the Tigris and Euphrates Rivers rise at the spring equinox). Yet Israel did not observe a spring-to-spring year until centuries after Abraham left Mesopotamia. So whether Israel began its year in the spring or the fall, one cannot "blame" its pagan neighbors for the fact.

to restore and to build Jerusalem unto the Messiah the Prince" (v. 25, KJV). That decree was first issued by Cyrus king of Persia, then reissued by Darius I, and finally reissued by Artaxerxes I. Sixty-nine weeks of years "from" Artaxerxes' seventh year (reckoned fall-to-fall, remember) brings us to the autumn of 27 A.D., when Jesus was "about thirty" years old. Three and a half years later, Jesus was "cut off, but not for Himself", and "in the midst of the [70th] week [of years]", thus "[causing] the sacrifice and the oblation to cease" (Daniel 9:26). This brings us to the spring of 31 A.D., the time of Jesus' crucifixion.

Some might be confused by the significance of "from" in Daniel 9:25. Our past teaching that Pentecost is counted "from (that is, beginning with) the morrow after the Sabbath" seems to contradict the above reckoning. Wouldn't the count "from" Artaxerxes' seventh year start at the beginning of the year, not at the end of the year?

The answer lies in the usage of the Hebrew preposition *min-* (or *mi-*). In many places, *min-* ("from") is defined "as marking the period immediately succeeding the limit, after" (*The New Brown-Driver-Briggs-Gesenius Hebrew-Aramaic Lexicon*, p. 581b). Thus in Leviticus 23:15-16, when counting Pentecost, "from (*mi-*) the morrow" means "after the morrow has arrived" or "on the morrow" -- that is, from the start of the "morrow". The same Hebrew phrase used in verse 15 is translated "unto (*mi-*) the morrow" in verse 16 (KJV). In both cases, the "limit" specified by *mi-* is the *beginning* of the day.

In Daniel 9:25, the "limit" is the "going forth of the commandment" to rebuild Jerusalem. The count of "weeks" begins (in "clock time") *after* the "commandment", not *before* it. In terms of calendar years, the "limit" is Artaxerxes' seventh year (fall-to-fall reckoning). After that year ends (not when it begins), the count of the "weeks" begins. This reckoning is confirmed not only by comparison with the New Testament, but with the testimonies of secular historians as well (cf. Hoeh, *op. cit.*, pp. 11-17).

Counting "from" Artaxerxes' seventh year, we come to the autumn of 27 A.D., when Jesus began to preach. Three and a half years later (as confirmed by Daniel 9:27 and New Testament chronology), Jesus was crucified on a Wednesday Passover in 31 A.D.

STUMBLING OVER LEAP YEARS

Our present sacred calendar puts "leap years" on Years 3, 6, 8, 11, 14, 17, 19 of the 19-year cycle. Because of the drift of the lunar months against the solar seasons (due to the indivisibility of the year by the month and the precession of the equinoxes), and because of cumulative inaccuracies in the calendar

calculations, the sequence of leap years in the biblical calendar must have been different in Jesus' day than it is today. Within a given 19-year cycle, the sequence of leap years then would have been Years 2, 5, 7, 10, 13, 16 and 18. Thus A.D. 28 and 31 were Years 7 and 10 in the current 19-year cycle, and therefore both leap years.

Some in God's Church and its sects have alleged that such a change of sequence would only be a matter of a shift in the reckoning of the "benchmark" for the Jewish calendar. (In effect, the real sequence would not have changed; just the way the sequence was counted.) Others claim that such a change would make "wild variations" in the dates of the Holy Days, or put them "too late" in the year. Neither charge has any basis in fact.

First, a one-year shift in the leap year cycle would ensure that Passover fell no earlier than April 2 (and no later than April 27), and Tabernacles fell no earlier than September 24 (and no later than October 22), throughout Jesus' lifetime. This is in complete accord with the biblical commands. (Note that in Jesus' day, the spring equinox occurred on March 23, rather than on March 20 as it does today. Likewise, the fall equinox then occurred on September 25, rather than September 22 as it does today.¹²) Yet the dates of the spring and fall Festivals would always be late enough to ensure that the harvests were ripened and gathered in time -- whereas the *irregular* Pharisaic calendar sometimes required an arbitrary intercalation due to the "late" ripening of spring crops.¹³

Now if the present leap year sequence were in effect in Jesus' day, Passover in 31 A.D. would fall on *Monday, March 26* (still in the spring), not *Wednesday, April 25* as it would under the shifted leap year cycle. But the Bible proves that Jesus' last Passover was on a Wednesday, not on a Monday. Moreover, if our current leap year sequence were used and Passover fell on a Monday, then Tabernacles in 31 A.D. would have fallen almost wholly in summer, not wholly in the fall. One cannot evade this by claiming that only the way of *counting* the leap year sequence was changed between Jesus' day and our own.

Finally, some claim that the year of Jesus' death was in 30 A.D., not 31 A.D. Passover would indeed fall on a Wednesday that year, according to the biblical calendar. (There is no question that 30 A.D. was a "common" year, thanks to the interrelationship of lunar months and solar seasons.) But the Bible's own

¹² Of course these dates are all on the Western world's "civil" calendar, as historians project it into the past: the Gregorian calendar in our day, the Julian calendar in antiquity.

¹³ The crops were "late" in ripening not because of the weather as such, but because the Pharisees and later Rabbis intercalated in an irregular manner. They did this because they ignored the biblical and astronomical factors that determine "common" and "leap" years! (For a discussion of these factors, see *Part One* of this series.)

chronology demands that Jesus died on a Wednesday Passover in 31 A.D., not 30 A.D. This means 31 A.D. must have been a leap year, which in turn confirms that the leap year sequence used in Jesus' day was shifted one year from that used today.

Remember from *Part One* of this series that by biblical and astronomical definition, some years in a 19-year cycle are *common years* and some are *leap years*. Were the current sequence of common and leap years used in Jesus' day, some years which were actually common would have been considered leap years and vice versa. But shift the sequence back by one year - reasonably, for the years prior to 142 A.D., when the Church of God came to believe¹⁴ the sequence was probably adjusted¹⁵ - and the astronomical and calendrical calculations "line up" as to the setting of the common and leap years.

DATING THE HOLY DAYS

In 31 A.D., the biblical calendar (as extrapolated from the modern calendar) and the Pharisaic calendar would put both Trumpets and the first day of Unleavened Bread on the same days -- that is, if the Pharisaic calendar made 31 A.D. a leap year. This would not in fact have happened (as we will see), since making 31 A.D. a "common" year would still put Passover in the spring (on Monday, March 26), even if this made the true fall equinox occur on the last day of Tabernacles.¹⁶

Few realize that Exodus 23:16 and 34:22 do not signify the same thing. As we have noted in *Part One* of this series, Exodus 23:16 says Tabernacles must occur *betse't ha-Shanah*, "when the year goes out". That is, it must occur at or after the beginning of the new agricultural year, (i.e., at or after the fall equinox). Exodus 34:22 says that Tabernacles must occur *tequfat ha-Shanah*: "(during the) turning of the year" (that is, during the period ending one agricultural year and beginning another, as centered on the fall equinox). In practical terms, these two statements combined mean that the fall equinox may fall *before or during* Tabernacles, but not *after* it. Likewise, Passover must fall "in the month of Abib [green ears or buds]" -- that is, *during the first month of spring* (see Part One).

¹⁴ "There is some evidence that an adjustment to the Hebrew calendar may have taken place during the patriarchate of Simon III (140-163)" (John A. Kossey, *The Hebrew Calendar: A Mathematical Introduction*, 1st edition, ed. Herman L. Hoeh [Ambassador College Press, 1974], p. 2-10, footnote). The footnote cites an article by Cyrus Adler, "Calendar", in the *Jewish Encyclopedia* (see below).

¹⁵ "Under the patriarchate of Simon III (140-163) a great quarrel arose concerning the feast days and the leap-year, which threatened to cause a permanent schism between the Babylonian and Palestinian [Jewish] communities - a result which was only averted by the exercise of much diplomacy" (Cyrus Adler, "Calendar", *Jewish Encyclopedia*, p. 500a).

¹⁶ The picture is complicated, in Rabbinic Judaism, by the use of an *approximate* length for the solar year of 365.25 days and a *mean* length for the solar seasons.

Yet due to the interaction of the lunar months with the solar seasons, in some years there are two lunar months in the spring and/or two lunar months in the fall which *a priori* may meet these biblical conditions. (For an explanation of why this may be so, see *Part One* of this series.) In 31 A.D., there were two lunar months in the spring *and* two lunar months in the fall which were "acceptable" *a priori*. Thanks to this state of affairs, in 31 A.D. the Pharisees (had they been in charge of the sacred calendar) would have put Passover in 31 A.D. one month earlier (and on a different day of the week besides) than do the adjusted calculations of our received calendar. Only if the seasonal conditions did not permit them to do otherwise (or so it would seem) did the Pharisees and later Rabbis ever intercalate a 13th month before the arrival of Abib/Nisan.

In any case, the other Holy Days during Jesus' ministry would have been set on different dates by the biblical and Pharisaic calendars (even assuming that they did not reckon leap years differently). For example (all else being equal in both calendars), Trumpets in 30 A.D. would have fallen on the Sabbath, September 16, according to the calculation of the *molad*. (No postponements would have applied in this case.) It would have fallen on Monday, September 18, according to the observation of the new crescent. Only by Sunday night, September 17, would the new crescent have been visible from Jerusalem. (Again, no postponements would have applied.)

Now a careful analysis of John 7:37-53 and chapters 8 and 9 (especially 9:14-16) shows that the Last Great Day in 30 A.D. was not only a Holy Day, but also a weekly Sabbath (cf. Hoeh, *op. cit.*, pp. 18-23). This means that Trumpets must have fallen on the Sabbath, not on Monday -- and this means that in Jesus' day, the beginning of the month was reckoned (all else being equal) from the calculation of the *molad*, not from the observation of the new crescent.

True, the Holy Days are also Sabbaths, regardless of the day of the week on which they fall. But the Holy Days are legally extensions of the weekly Sabbath, not vice versa. Thus in John 19:31, John explains that "*great* was that sabbath day" (literal translation). This "sabbath" was a Holy Day, and thus not necessarily the seventh day of the week. But in John 7:37, John speaks of "the last day, the *great* (day) of the feast" (literal translation). He then specifies that this Holy Day was a "sabbath" (John 9:14-16) -- which would not have been necessary to mention unless this day were also a *weekly* Sabbath. Moreover, the strictness of the Law regarding the *weekly* Sabbath applied on that day, as far as the Jews were concerned (9:15-16; cf. 5:1-18; 6:19-24). But the Holy Days of Unleavened Bread (due to the "hierarchy of holiness" already discussed in Part One) did not have such tight restrictions on "work", unless they happened to fall on the *weekly* Sabbath.

Thus the Last Great Day fell on the Sabbath, October 7, in 31 A.D. (It would have not done so, according to either the biblical or the Pharisaic calendar, in 29 or 32 A.D., as one would expect had Jesus died in 30 or 33 A.D.) "The next spring (A.D. 31) the Passover and crucifixion fell on a Wednesday," writes Dr. Hoeh. "Such a combination of the eighth or Last Great Day on a Sabbath and the Passover on a Wednesday occurred at no other time in Jesus' ministry [according to the biblical calendar]! Nor would such a combination be possible at any time in Jesus' ministry if the *later*, temporary Pharisaic and Rabbinic custom of observation of the new moon [i.e., the new crescent] were in force during Jesus' ministry" (Hoeh, *op. cit.*, p. 23).

What of the "*second-first sabbath*" in Luke 6:1 - called simply a "sabbath" in the other Gospel accounts? The Greek grammar does not fit the idea of "the second of seven Sabbaths that were counted from Passover to Pentecost" (Hoeh, *op. cit.*, p. 16), nor of the weekly Sabbath following the first Holy Day of Unleavened Bread (as *The Companion Bible* and other works assume). The first idea begs the question of why the second Sabbath to Pentecost would require a special term (since it has no religious significance). The second assumption puts the "second-first sabbath" on what the Jews call *Shabbat Chol ha-Mo`ed*: the Sabbath during the "profane" days of Unleavened Bread, on which Sabbath Judaism holds special services. But were this day meant, why did Luke not use a Greek translation of the appropriate Hebrew or Aramaic term?¹⁷

A simpler explanation is that the Greek phrase means "*the second Sabbath of the first rank*" -- that is, the second Holy Day of Unleavened Bread. Again, under the biblical calendar this Holy Day would have fallen on the weekly Sabbath, April 23, in 29 A.D. -- the year which the chronology of Jesus' ministry requires. (Thus there would have been no *Shabbat Chol ha-Mo`ed* during Unleavened Bread that year.) This is because *Postponement Rule 2* (concerning an "afternoon" *molad*) would have postponed Tishri 1 by one day, in order to keep the calendar aligned with world time. By contrast, the second Holy Day would have fallen one day later (Sunday, April 24) were the "new moons" reckoned from the new crescent visible at Jerusalem.

Again, according to the adjusted calculations of our received calendar, in 31 A.D. Molad Tishri would have fallen about midnight on Friday. In order for Passover to fall on Wednesday that year (given the traditional and constant 164

¹⁷ Here again, the picture is complicated by later Christian Greek usage. Both ancient and modern interpreters could make no sense of the Greek phrase in Luke 6:1 (not surprisingly, since none of them kept the biblical Holy Days). Even *Bauer-Arndt-Gingrich's* authoritative Greek-English Lexicon is rather perplexed by the usage of the word *deuteropros*, which it calls "a word of doubtful meaning" (Walter Bauer, *A Greek-English Lexicon of the New Testament and Other Early Christian Literature*, translated and augmented by William F. Arndt and F. Wilbur Gingrich, 2nd edition [University of Chicago Press, 1979], p. 177a).

days between the 1st Day of Unleavened Bread and Trumpets, counting inclusively¹⁸), *Postponement Rule 1* must have been in effect. Thus Trumpets would have fallen on the Sabbath, October 6, ensuring that *none* of the fall Holy Days would have been back-to-back with the Sabbath. By extension (because of the *hierarchy of restraints* upon "work" given to the Sabbath and Holy Days), the calendar in Jesus' day would have forbidden Trumpets to fall on Sunday or Wednesday as well as Friday. With both Rules 1 and 2 in effect (Rule 2 thanks to the implications of Genesis 1), *Rules 3 and 4* also would have been in effect by logical necessity.

THE CALENDAR AND A HEAVENLY "SIGN"

So the biblical and astronomical data are consistent with the biblical, not the Pharisaic calendar being in force in Jesus' day. There is one other evidence, often overlooked, that we must examine.

We have already seen that the Pharisees (barring special seasonal conditions in 31 A.D.) would not have made 31 A.D. a leap year. Yet 31 A.D. must have been a leap year in order for the Passover to fall on a Wednesday; otherwise, Passover would have fallen on Monday, March 26. (Again, had the Pharisees been in charge and had made 31 A.D. a leap year, Passover would have fallen on the same day in their calendar as it would according to the biblical calendar.)

But Peter's use of Joel 3:28-32 in Acts 2:17-21 shows that Passover in 31 A.D. could not have fallen in March. The time order in Joel's original prophecy (as indicated by the original Hebrew) is 3:30-32, then 3:28-29. The signs in heaven and earth (including *a darkening of the sun and a reddening of the moon*) must occur first; then, the offer of salvation to those who "call upon the Lord"; then, the outpouring of the Spirit and the gifts that accompany it. Since Peter's statement in Acts 2:16 ("this is that... ") makes the whole of Joel's prophecy (not just the beginning or ending of it) dual in application, this means that a darkening of the sun and a reddening of the moon must have preceded the events of Pentecost, when the Spirit was poured out on those who "called upon the Lord" (first the apostles, then those they baptized).

We know from the Gospels that *a supernatural darkening of the sun* accompanied Jesus' crucifixion and death on Passover afternoon. Though the Gospels do not mention a reddening of the moon, Peter's use of Joel demands that such a "sign" must have closely followed the darkening of the sun.

¹⁸ In our received calendar, each of the first through the seventh months of the sacred calendar always has the same number of days (29 or 30, depending on the month), whether the years are "deficient", "regular" or "perfect", or whether they are "common" or "leap" years (Kossey, *op. cit.*, p. 8-17).

According to astronomical calculation, a *lunar eclipse* occurred high over Jerusalem the very night after Passover, the "Night to be Much Observed": Wednesday, April 25 (Nisan or Abib 15), 31 A.D. Had there been enough clouds in the earth's atmosphere at the time, the moon figuratively would have "*turned to blood*", or even been partially *darkened*.

These heavenly "signs" would have been seen all over the Roman world. The darkening of the sun was recorded *as far west as Rome*;¹⁹ the lunar eclipse would have been visible all over the night side of the earth. The Jews who came to Jerusalem for Pentecost would have wondered what these "signs" meant. Was the prophesied "day of the Lord" at hand? Peter answered that question *in type*, as part of his introduction to the ministry, death and resurrection of Jesus. His answer made his message that much more compelling to his audience.

A CORD NOT QUICKLY BROKEN

Thus we may assert the following about the sacred calendar in Jesus' day:

- 1) It was based on a regular 19-year cycle of common and leap years, one identical to the cycle used in our current calendar (save that the cycle was shifted one year from that used today);
- 2) It began its calendar months (*all else being equal*) on the calendar day of the mean conjunction of the sun and moon, not on the calendar day when the new crescent was visible from Jerusalem;
- 3) It set the Festivals and Holy Days on the same calendar days that our present calendar (extrapolated into the past and adjusted for the shift in the 19-year cycle) would have set them;
- 4) It used the same fundamental rules of postponement (Rules 1 and 2, and therefore 3 and 4) that are used in our received calendar.

In short, only the leap year sequence within a 19-year cycle was demonstrably different in Jesus' day from that used today. At the end of this paper, the interested reader will find a table presenting the evidence for this assertion: the raw astronomical and calendrical data as calculated by the *Voyager II*TM planetarium program, for the years 3-40 A.D.

"FUDGING" THE BIBLE AND HISTORY

¹⁹ This event is usually misdated (thanks to the early Catholic Church historian Eusebius) to 33 A.D. There was indeed a lunar eclipse on the night of Nisan or Abib 15 that year, which was also Friday night. But Jesus died on a Wednesday, not a Friday - and the eclipse in 33 A.D. had already ended or was just ending by moonrise at Jerusalem.

So why do early and modern Jewish sources point to the use of a *different* calendar in the days of the Second Temple? The only possible explanation is that these sources have misunderstood or misrepresented the biblical and historical evidence. In other words, *they have (willy-nilly) "fudged" the Bible and history to their own advantage!*

The sharp disagreement between the Talmudists on the most basic aspects of the calendar, the Temple liturgy and many other matters proves that they were *ignorant or uncertain* about many details of their own traditions. For example, one Rabbi Simeon alleged that Rabbi Akiba (1st-2nd centuries A.D.), while in prison, intercalated three years in succession. (This would have happened after the fall of the Second Temple.) "The Rabbis, however, retorted... "The court [of the Sanhedrin] sat and intercalated each year at its proper time" (*Sanhedrin* 12a, Soncino edition, p. 53). Does this mean that Rabbi Simeon erred (because it is *physically impossible* to intercalate three calendar years in a row)? Or did the other Rabbis err as to what the Sanhedrin did (or would have done)? Or did Rabbi Akiba simply *calculate* when the next three leap years would fall (as the editor of the Soncino edition thinks) -- only perhaps to have his calculations overruled by the Sanhedrin for one or another, empirical reason?

What then is the *truth*? After the fall of the Second Temple, the Pharisees usurped the leadership of the Sanhedrin from the Sadducees. From that time forward (and for several centuries), the calendar was reckoned according to the Pharisaic method, not the method preserved by the priests. Months were reckoned from the observation of the new crescent, not from the calculation of the *molad*. The leap year sequence became irregular, as did the number of "full" months in the year and the length of the year.

The way the Pharisee-led Sanhedrin handled "postponements" illustrates the *empiricism* of its calendar. The Pharisees had no "noon or after" postponement for Tishri 1, because a local calendar which begins its months with the new crescent *does not require one*. On the other hand, the Pharisees *did* postpone Tishri 1 in order to keep certain festival days (especially Atonement) from falling back-to-back with the weekly Sabbath.

The problem, of course, lay in "postponing" Tishri 1 when the new crescent fell at an "inconvenient" time. One cannot "postpone" the moon in its heavenly motions! So the Sanhedrin *speeded up or prolonged* its deliberations as necessary, and made *special observations* in hopes of seeing the new crescent as early as possible. If necessary, it used some astronomical "hairsplitting" to move the day of the new crescent to a "convenient" time. If the new crescent appeared before the stars, it "belonged" to the preceding calendar day. If the new crescent

appeared after the stars, it "belonged" to the current calendar day (cf. "Calendar", *Encyclopedia Judaica*, columns 46 and 49).

Thus the Pharisaic and later Rabbinic calendar (as originally influenced, no doubt, by one or another *pagan* calendar) was based on the "*narrow observation* of days, and months, and seasons, and years" (cf. Galatians 4:10, literal Greek).²⁰ To the Pharisees and Rabbis, the adjustment of the calendar to the *day* took precedence even over its adjustment to the *month*. After that, it was adjusted to the *seasons* (by a simple count of twelve lunar months per calendar year, until the timing of the spring equinox and of the associated ripening of crops forced them to intercalate). Only after that was their calendar adjusted to the *year* (and that with considerably greater variation than in the adjustments to the year made by our received calendar).

What were the *fruits* of the Pharisaic approach? From the time of the Pharisees' ascendancy forward, Judaism had less and less unity on calendrical matters. (For example, the Sadducees at times used *false witnesses* to try to "throw off" the Pharisees' reckoning from the new crescent!) It took the efforts of Hillel II and others to restore the calendar to its biblical foundations (in its present form, no later than the tenth century A.D.). Political infighting and intrigue often marked even these efforts. Yet the result was a calendar with rules "by which the astronomical facts [were] combined with the religious requirements into an admirable calendar system" (Arthur Spier, *The Comprehensive Hebrew Calendar*, p. 2).

DIVINE AND HUMAN AUTHORITY

It comes down to this: *Do we trust the infallible God to work through fallible (even unconverted) human authority? Or do we lose faith in the way God works, and lean to our own understanding* (cf. Proverbs 3:5-8) in secondary, highly technical matters related to the Law (cf. 1 Timothy 1:3-7)?

If we in God's Church (ministers and members) have the right spiritual priorities, God will help us set in order even matters as technical as the sacred calendar. We may not settle an issue fully at first -- but *we will settle it*, sooner or later. Meanwhile, honest questions by honest people are to be encouraged - not to be seen as evidence of doubt or rebellion. (I have tried to answer the most

²⁰ In effect, Paul *raised* the "calendar issue" only long enough to *dismiss* it. He called observance of what was apparently the Pharisaic calendar (which was in its principles similar to certain pagan calendars) a return to "bondage" under "the weak and beggarly elements (of the world)" - and added, "I am afraid I have labored over you (who observe this calendar) in vain" (Galatians 4:8-11). In context, he could hardly have been talking about a pagan calendar as such, since the whole book discusses a "works of law" heresy. He was, however, talking about a return to enslavement to "the elements of the world", to which even the adherents of the ceremonial law of the Pentateuch were in bondage (cf. Galatians 4:1-7).

important of such questions, here in this series.) But those inclined to be *factious*, about the calendar or anything else, should be *shunned* (cf. Titus 2:8-11). Their *mixtures of truth and error* come from the very Tree of Knowledge of Good and Evil (cf. Genesis 3).

Whether such people want to believe it or not, God *did* use the Jews despite themselves to preserve the sacred calendar. *The faithfulness of God, not of man, is at stake here.* If the Jews did not preserve the calendar in all its essentials, then *God (not man) is a liar!* Yet all the evidence confirms God's faithfulness in this matter. *How* He preserved the calendar through the Jews is an interesting study of itself. *Whether* He did so need not be in doubt within God's Church. ###

TABLE OF FULL MOONS (SPRING AND FALL), 3-40 A.D.

The following table lists the times of opposition of the sun and moon, during the periods of March-April and September-October for the years 3-40 A.D. (The *Voyager II*TM program for the Macintosh automatically corrects for the historical changes in the earth's rotation, and gives the ephemerides as provided by the U.S. Naval Observatory). All times are given as GMT: Greenwich Meridian Time. Thus, the opposition (and thus the lunar eclipse) on April 25, 31 A.D., occurred at 1912 (here, 19:12) hours GMT; it occurred about 9:30 p.m., local Jerusalem time. The calendar date of the astronomical full moon during the month of Abib is marked in green; the calendar date of the astronomical full moon during the month of Tishri is marked in yellow. In both cases, the Hebrew months are reckoned according to the adjusted calculations of the received calendar.

I have chosen the years 3-40 A.D. because this period covers *two full Metonic (19-year) cycles*. Common and leap years as determined by the *adjusted* rules of our received calendar are noted. (Remember that in the Church of God's calendrical calculations, for the years before 142 A.D., the sequence of common and leap years was *shifted back one year* from that used today.) For comparison, the table also gives the sequence of common and leap years as they would be determined if their sequence were left uncorrected (that is, as it is used today). Common and leap years are reckoned fall-to-fall from the Tishri 1 preceding "the month of Abib" in each year. Leap years as defined by both sequences are marked in red.

Note that during this period of time, the spring equinox occurred on March 23, rather than on March 21 as it does today. Likewise, the fall equinox then occurred on September 25, rather than September 22 as it does today. Let the reader keep in mind also that the following table deals with *exact* times (as calculated) for the full moons in various years, as converted to Greenwich Meridian Time (GMT). The received Hebrew calendar, by contrast, deals with *average* values for the times of the new and full moons, as originally calculated from a benchmark originally measured noon-to-noon at a latitude that was certainly not that of Greenwich.

The following table nevertheless gives the raw data that enabled me to determine:

- 1) The sequence of common and leap years is determined by astronomical factors as related to biblical law.
- 2) In some years between 3-40 A.D., the spring equinox fell within a given lunar month before the calendar day of the full moon, *or* after the

calendar day of the full moon within the previous lunar month; *and* the fall equinox fell before or during (never after) the seven-day period beginning with the calendar day of the full moon, six lunar months after the "month of Abib" occurred as defined by the preceding conditions. *These years were, by definition, common years. All other years were, by definition, leap years.*

- 3) During some leap years, a lunar month in the spring that would otherwise be "acceptable" under astronomical and biblical criteria could not be "the month of Abib", because Tabernacles would then occur too early according to the same criteria.
- 4) During other leap years, a lunar month in the fall that would otherwise be "acceptable" under astronomical and biblical criteria could not be "the month of Tishri", because Passover would then occur too early according to the same criteria.
- 5) During the remaining leap years (one of which is 31 A.D., the year of Jesus' death), a lunar month in the spring *and* a lunar month in the fall that would otherwise be "acceptable" under astronomical and biblical criteria could not be "the months of Abib and Tishri", respectively. This is because the following year was *always* (by the same criteria) a *common year* (which is true of every year that follows a leap year).

Historical Years (Julian Calendar)	Spring Full Moons		Fall Full Moon		Common & Leap Years ("pre-142 A.D." sequence)	Common & Leap Years ("post-142 A.D." sequence)
	Date	GMT	Date	GMT		
3	03-07 04-05	02:56 11:12	09-29 10-28	02:00 20:24	1	1
4	03-25 04-23	03:20 11:36	09-17 10-16	06:24 21:12	2	2
5	03-14 04-13	14:24 01:44	09-06 10-06	18:00 04:48	3	3
6	03-03 04-02	18:16 09:20	09-25 10-25	18:56 05:28	4	4
7	03-22 04-21	10:56 02:40	09-15 10-14	11:04 20:56	5	5
8	03-10 04-09	11:28 02:32	09-04 10-03	01:04 11:44	6	6
9	03-29 04-27	07:28 20:32	09-22 10-22	22:40 12:08	7	7
10	03-18 04-17	17:52 04:40	09-12 10-11	02:24 19:04	8	8
11	03-08 04-06	09:52 18:16	09-30 10-30	20:24 15:20	9	9
12	03-26 04-24	11:04 18:48	09-18 10-18	20:16 15:20	10	10
13	03-16 04-14	02:16 11:44	09-08 10-07	03:52 17:20	11	11
14	03-05 04-04	11:20 00:24	09-27 10-26	03:20 15:12	12	12
15	03-24 04-22	05:52 19:28	09-16 10-16	18:32 04:08	13	13
16	03-12 04-10	06:00 21:20	09-05 10-04	10:40 20:16	14	14
17	03-30 04-29	22:40 13:52	09-24 10-23	10:16 22:08	15	15
18	03-20 04-18	04:48 17:20	09-13 10-13	18:32 09:52	16	16
19	03-09 04-08	17:04 03:12	09-02 10-02	21:36 14:24	17	17
20	03-27 04-26	18:00 02:16	09-20 10-20	14:40 09:52	18	18
21	03-17 04-15	10:56 19:04	09-09 10-09	16:18 09:36	19	19
22	03-07 04-05	00:56 10:56	09-28 10-28	14:00 05:20	1	1
23	03-25 04-24	21:52 09:12	09-18 10-17	02:24 13:12	2	2
24	03-14 04-12	01:28 16:16	09-06 10-06	18:24 03:36	3	3
25	03-03 04-01	01:20 16:56	09-25 10-25	19:36 05:20	4	4
26	03-21 04-20	19:04 09:52	09-15 10-14	08:48 20:32	5	5
27	03-11 04-09	03:12 13:44	09-04 10-04	15:20 06:08	6	6
28	03-29 04-27	02:00 11:04	09-22 10-22	09:36 04:24	7	7
29	03-18 04-17	17:28 02:24	09-11 10-11	09:52 04:56	8	8
30	03-08 04-06	10:32 18:48	09-30 10-29	04:56 22:48	9	9
31	03-27 04-25	10:00 19:12	09-19 10-19	11:52 01:44	10	10
32	03-15 04-14	18:24 07:44	09-08 10-07	01:36 11:44	11	11
33	03-04 04-03	20:16 12:40	09-27 10-27	03:04 12:48	12	12
34	03-23 04-22	12:56 04:24	09-16 10-16	18:48 05:04	13	13
35	03-12 04-11	15:36 05:52	09-06 10-05	06:40 18:48	14	14
36	03-30 04-29	11:36 00:16	09-24 10-23	03:04 16:48	15	15
37	03-20 04-18	01:04 10:16	09-13 10-12	04:40 23:04	16	16
38	03-09 04-08	17:44 02:08	09-02 10-01	05:28 22:48	17	17
39	03-28 04-27	19:04 02:48	09-21 10-20	00:56 17:44	18	18
40	03-17 04-15	08:40 18:40	09-09 10-08	10:08 22:24	19	19