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Repetition of 19 Years Throughout the Last 1900 Years

by Floyd R. Cox - Revised 4-06-16

Why is a lunar-solar calendar important? There are several reasons. 1. King David and Solomon used it to compel all 12 tribes of Israel to come to Jerusalem to celebrate high days and give them financial support. 2. Special events have occurred on new moons, full moons, sabbaticals and jubilee years. 3. Future events are likely to happen according to these same days and years. This can be used to create a religion based upon prophecy.

12 Moons in Sync with 12 Months

A lunar-solar calendar adds a 13th lunar month seven times in 19 years to keeps lunar years (12 lunar months) in sync with solar years (12 solar months) in order to begin the years and four seasons at the right time. We know that spring now begins on about March 21, when days and nights are equal (equinox means "equal nights". Therefore, the solar years can be counted with a sundial, which shows when sun rises due east and sets due west on a certain day each year.

If the new moon happened to begin at the day of the equinox, the 12th moon would be short about 11 days of reaching 365 days. In the third year, the gap would expand to about 33 days, and an extra 13th moon would be needed to place the 14th moon near the equinox, at the beginning of a new year, as the first moon of the next year. This needs to be done seven times in 19 years – 235 moons altogether. 11 days after the beginning of the 235th moon, an eclipse usually occurs because there is room for one more moon before the 19 years are complete, and the same sequence starts over during the next 19 years. The previous 18 years before these 11 days are called a "Saros" or "eclipse cycle".

Having said this, how do we know when the beginning of the 19 years has begun in the past?

Cycles Began in 3761 and 37 BC

Finding when the 19-year cycle and 7-year cycle have begun has been an insurmountable task for almost everyone.

One minister instructed his followers to simply count from the dates they were baptized and wait for Christ to return to restore the proper year. Could he have been more certain of when the seventh year is?

Yes, the answer is rather simple once it has been revealed. The key is found in 37 BC, when Herod conquered Jerusalem The Levite priest-historian, Josephus, said this was in a sabbatical year.

The first key is to count the 7 years and 19 years from the rabbinical date of Creation, that is, from 3761 BC. Moreover, if Herod captured Jerusalem in 37 BC, then it was both a seventh year and also the 19th year. How can we prove this? 37 BC was 196 x **19 years** after rabbinical date of Creation in 3761 BC. It was also 19 x **4 jubilees** (196 yrs.) after Creation!

TABLE 1. Time Pattern of 37 BC

From	To	Years
3761 BC (rabbinical Creation)	37 BC	3724 (4 jubilees x 19)
3761 BC	37 BC	(196 19-year cycles)
968 BC (temple)	37 BC	931 (19 jubilees)
968 BC	37 BC	(49 19-year cycles)
968 BC	37 BC	(1 jubilee x 19)
331 (Alexander's sabbatical grant)	37 BC	294 (6 jubilees)

TABLE 2a. 228-Year Cycle 3957 BC to 622 AD

	-3192		-2964	-2726	-2508	-2280	-2052	-1824	-1596	Continues below
	19 yrs	228	228	228	228	228	228	228	1368 yrs	

19 yrs	3958	3958	3939	3769	3711	3483	3255	3027	2799	2571	2343	2115
0	4-11	3958	4/12	3769	4/13	4/14	4/15	4/16	4/17	4/18	4/19	3/21
1	3-31	3957	4/1	3768	4/2	4/3	4/4	4/5	4/6	4/7	4/8	4/8
2	4-19	3956	3/21	3767	3/22	3/23	3/24	3/25	3/26	3/27	3/28	3/28
3	4/8	3955	4/8	3766	4/10	4/11	4/12	4/13	4/14	4/15	4/16	4/16
4	3/28	3954	3/28	3765	3/30	3/31	4/1	4/2	4/3	4/4	4/5	4/5
5	4/16	3953	4/16	3764	4/18	4/19	3/21	3/22	3/23	3/24	3/25	3/25
6	4/5	3952	4/5	3763	4/7	4/8	4/8	4/9	4/11	4/12	4/13	4/13
7	3-25	3951	3/25	3761	3/27	3/28	3/28	3/29	3/31	4/1	4/2	4/2
8	4-12	3950	4/13	3760	4/15	4/16	4/16	4/17	4/19	3/21	3/22	3/22
9	4/1	3949	4/2	3759	4/4	4/3	4/5	4/6	4/8	4/8	4/9	4/10
10	3/22	3948	3/22	3758	3/24	3/25	3/25	3/26	3/28	3/28	3/29	3/30
11	4/10	3947	4/10	3757	4/12	4/13	4/13	4/14	4/16	4/16	4/17	4/18
12	3/30	3946	3/30	3756	4/1	4/2	4/2	4/3	4/5	4/5	4/6	4/7
13	4/18	3945	4/18	3755	3/21	3/22	3/22	3/23	3/25	3/25	3/26	3/27
14	4/7	3944	4/7	3754	4/9	4/10	4/10	4/11	4/13	4/13	4/14	4/15
15	3/26	3943	3/27	3753	3/28	3/30	3/30	3/31	4/2	4/2	4/3	4/4
16	4/14	3942	4/15	3752	4/16	4/18	4/18	4/19	3/22	3/22	3/23	3/24
17	4/3	3941	4/4	3751	4/5	4/7	4/7	4/8	4/9	4/10	4/11	4/12
18	3/23	3940	3/24	3750	3/25	3/26	3/27	3/28	3/29	3/30	3/31	4/1
19	4/11	3939	4/12	3749	4/13	4/14	4/15	4/16	4/17	4/18	4/19	3/21

	-1368	-1140	-912	-684	-456	-228	1	229	457	685		913	1141	1369
	228	228	228	228	228	228	228	228	228	228		228	228	
	1368 yrs						1368 yrs							

	2115	1887	1659	1431	1203	975	747	519	291	63 BC	44 BC	166 AD	394 AD	622 AD
0	3/21	3/22	3/23	3/24	3/25	3/26	3/27	3/28	3/29	3/30	44	3/31	4/1	4/2
1	4/8	4/10	4/11	4/12	4/13	4/14	4/15	4/16	4/17	4/18	43	4/19	3/21	3/22
2	3/28	3/30	3/31	4/1	4/2	4/3	4/4	4/5	4/6	4/7	42	4/8	4/8	4/10
3	4/16	4/18	4/19	3/21	3/22	3/23	3/24	3/25	3/26	3/27	41	3/28	3/28	3/30
4	4/5	4/7	4/8	4/8	4/10	4/11	4/12	4/13	4/14	4/15	40	4/16	4/16	4/18
5	3/25	3/27	3/28	3/28	3/30	3/31	4/1	4/2	4/3	4/4	39	4/5	4/5	4/7
6	4/13	4/15	4/16	4/16	4/18	4/19	3/21	3/22	3/23	3/24	38	3/25	3/25	3/27
7	4/2	4/4	4/5	4/5	4/7	4/8	4/8	4/9	4/11	4/12	**37 BC**	4/13	4/13	4/15
8	3/22	3/24	3/25	3/25	3/27	3/28	3/28	3/29	3/31	4/1	36	4/2	4/2	4/4
9	4/10	4/12	4/13	4/13	4/15	4/16	4/16	4/17	4/19	3/21	35	3/22	3/22	3/24
10	3/30	4/1	4/2	4/2	4/4	4/5	4/5	4/6	4/8	4/8	34	4/9	4/10	4/12
11	4/18	3/21	3/22	3/22	3/24	3/25	3/25	3/26	3/28	3/28	33	3/29	3/30	4/1
12	4/7	4/8	4/9	4/10	4/12	4/13	4/13	4/14	4/16	4/16	32	4/17	4/18	3/21
13	3/27	3/28	3/29	3/30	4/1	4/2	4/2	4/3	4/5	4/5	31	4/6	4/7	4/8
14	4/15	4/16	4/17	4/18	3/21	3/22	3/22	3/23	3/25	3/25	30	3/26	3/27	3/28
15	4/4	4/5	4/6	4/7	4/9	4/10	4/10	4/11	4/13	4/13	29	4/14	4/15	4/16
16	3/24	3/25	3/26	3/27	3/28	3/30	3/30	3/31	4/2	4/2	28	4/3	4/4	4/5
17	4/12	4/13	4/14	4/15	4/16	4/18	4/18	4/19	3/22	3/22	27	3/23	3/24	3/25
18	4/1	4/2	4/3	4/4	4/5	4/7	4/7	4/8	4/9	4/10	26 BC to 31AD	4/11	4/12	4/13
19	3/21	3/22	3/23	3/24	3/25	3/26	3/27	3/28	3/29	3/30	25	3/31	4/1	4/2
													3/21	

Note on TABLE 2b: The 19-year cycle and Easter cycle of Dionysius began in 532 AD with Passover full moons on 4/05, 5/25, 4/13, 4/02, 3/22, 4/10, 3/30, 4/18, 4/07, 3/27, 4/15, 4/04, 3/24, 4/12, 4/01, 3/21, 4/09, 3/29, 4/17 and 4/05. After the Passover, the Wave Sheaf Offering (Easter) was on the first Sunday as easily found with the following tool: http://www.timeanddate.com/ .

These Passover dates are 14 days after the above new moons listed from the 5th year of the 394 AD column down to 626 AD in the 4th year of the 394 AD column. Notice also that the 532-year cycle also existed from 3761 BC (from the Jewish date of creation) down to 37 BC (when Herod captured Jerusalem (after 532 x 7 years after creation). This period is 532 times 7 or 76 jubilees.

TABLE 2b. 228-Year Cycle 3957 BC to 622 AD, Continued

1141	1369	1595	1825	2053	2281	2509	2737

228	228	228	228	228	228	228	19

AD ◄- - - - - - - - 1368 yrs - - - - - - - - - ►

	394	622	850	1078	1306	1534	1762	1990	1990	2009
0	4/1	4/2	4/3	4/4	4/5	4/6	4/7	4/8	1989	2008
1	3/21	3/22	3/23	3/24	3/25	3/26	3/27	3/28	1990	2009
2	4/8	4/10	4/11	4/12	4/13	4/14	4/15	4/16	1991	2010
3	3/28	3/30	3/31	4/1	4/2	4/3	4/4	4/5	1992	2011
4	4/16	4/18	4/19	3/21	3/22	3/23	3/24	3/25	1993	2012
5	4/5	4/7	4/8	4/8	4/10	4/11	4/12	4/13	1994	2013
6	3/25	3/27	3/28	3/28	3/30	3/31	4/1	4/2	1995	2014
7	4/13	4/15	4/16	4/16	4/18	4/19	3/21	3/22	1996	2015
8	4/2	4/4	4/5	4/5	4/7	4/8	4/8	4/9	1997	2016
9	3/22	3/24	3/25	3/25	3/27	3/28	3/28	3/29	1998	2017
10	4/10	4/12	4/13	4/13	4/15	4/16	4/16	4/17	1999	2018
11	3/30	4/1	4/2	4/2	4/4	4/5	4/5	4/7	2000	2019
12	4/18	3/21	3/22	3/22	3/24	3/25	3-25	3/26	2001	2020
13	4/7	4/8	4/9	4/10	4/12	4/13	4/13	4/14	2002	2021
14	3/27	3/28	3/29	3/30	4/1	4/2	4/2	4/3	2003	2022
15	4/15	4/16	4/17	4/18	3/21	3/22	3/22	3/23	2004	2023
16	4/4	4/5	4/6	4/7	4/9	4/10	4/10	4/11	2005	2024
17	3/24	3/25	3/26	3/27	3/28	3/30	3/30	4-1	2006	2025
18	4/12	4/13	4/14	4/15	4/16	4/18	4/18	3-21	2007	2026
19	4/1	4/2	4/3	4/4	4/5	4/7	4/7	4/8	2008	2027

TABLE 3. 228, 342 and 1368-year Cycles
(Based on timeanddate.com) (Israel/Show Calendar)

AD	New Moon		Full Moon		AD	Full Moon		
31	Apr 10	Tue	Apr 25	Wed	31	Apr 25	Wed	Crucifixion in 31 AD
+228					+342			
259	Apr 10	Sun	Apr 24	Sun	373	Apr 23	Tue	
+228								
487	Apr 09	Thur	Apr 23	Thur				
+228					+342			
715	Apr 08	Mon	Apr 23	Tue	715	Apr 23	Tue	
+228								
943	Apr 07	Fri	Apr 23	Sun				
+228					+342			
1171	Apr 07	Wed	Apr 21	Wed	1057			
+228					+342			
1399	Apr 06	Sun	Apr 20	Sun	1399	Apr 20	Sun	1368 yrs (228 x 6) (342 x 4)
+228								
1627	Apr 05	Thur	Apr 20	Fri				
+228					+342			
1855	Apr 04	Mon	Apr 20	Wed	1741	Apr 20	Mon	
+228					+342			
2083	Apr 17	Sat	Apr 2	Fri	2083	Apr 2	Fri	
+228								
2311	Apr 20	Sun	Apr 4	Tue				
+228					+342			
2539	Apr 20	Mon	Apr 4	Sat	2425	Apr 3	Tue	
+228					+342			
2767	Apr 20	Thur	Apr 6	Thur	2767	Apr 6	Thur	1368 yrs (228 x 6) (342 x 4)
+228								
2995	Apr 21	Tue	Apr 7	Tue				
+228					+342			
3223	Apr 20	Sat	Apr 7	Fri	3109	Apr 7	Wed	
+228					+342			
3451	Apr 24	Thur	Apr 8	Tue	3451	Apr 8	Tue	

Problem: 235 Moons Slightly Longer than 19 Years

1.) The tropical calendar has 365 days and needs a leap year every four years to make it 365.25 days. It subtracts one day every 128 years against the spring equinox and the seasons.

It equals 365.2421988 days (365 +.25 –1/128 = 365.2421988 days per solar year)

2.) The Julius Caesar calendar had 365 days and needed a leap year every four years to make it 365.25 (365 + .25 = 365.25). It was one day too long every 128 years and needed to be corrected by the Gregorian calendar.

3.) The Gregorian calendar ignores the 128-year correction and simply deletes three leap days every 400 years: (365 +.25 -3/400 = **365.2425**), that is, (365 +.25 -.0075 = **365.2425**), that is, (365.2500 – 3/400 = **365.2425**).
(365 + .25 = 365.25). It has 83,275.29 days in 228 years and needs one day every 228 years to match the Metonic.

4.) The Metonic lunar-solar calendar has 365.2467463 days per solar year. The number of days in 19 years can be compared with the days in 235 moons in 19 years. It has 83,276.256 days in 228 years.

TABLE 4. 228-Year Intercalary Cycle from 747 BC to 622 AD, 1368 years

The 19-year cycle needs corrected one day every 228 years
The intercalary moon is represented by +19 days (-11 + 30 = +19)

228-yr cycle	228	228	228	228	228	228	19-year Intercalation Sequence
	◄		1368 yrs			►	

Babylon 19-yr. Sequence	Hebrew 19-yr. Sequence	747	519	291	63 BC	166 AD	394	622	747 BC V	63 BC V	166 AD V
0		3/27	3/28	3/29	3/30	3/31	4/1	4/2			
		+19	+19	+19	+19	+19	-11	-11			
1	12	4/15	4/16	4/17	4/18	4/19	3/21	3/22			
		-11	-11	-11	-11	-11	+18	+19			
2	13	4/4	4/5	4/6	4/7	4/8	4/8	4/10			
		-11	-11	-11	-11	-11	-11	-11			
3	14	3/24	3/25	3/26	3/27	3/28	3/28	3/30	3	3	3
		+19	+19	+19	+19	+19	+19	+19			
4	15	4/12	4/13	4/14	4/15	4/16	4/16	4/18			
		-11	-11	-11	-11	-11	-11	-11			
5	16	4/1	4/2	4/3	4/4	4/5	4/5	4/7			
		-11	-11	-11	-11	-11	-11	-11			
6	17	3/21	3/22	3/23	3/24	3/25	3/25	3/27	6	6	6
		+18	+18	+19	+19	+19	+19	+19			
7	18	4/8	4/9	4/11	4/12	4/13	4/13	4/15			
		-11	-11	-11	-11	-11	-11	-11			
8	19	3/28	3/29	3/31	4/1	4/2	4/2	4/4	8		
		+19	+19	+19	-11	-11	-11	-11			
9	1	4/16	4/17	4/19	3/21	3/22	3/22	3/24		9	9
		-11	-11	-11	+18	+18	+19	+19			
10	2	4/5	4/6	4/8	4/8	4/9	4/10	4/12			
		-11	-11	-11	-11	-11	-11	-11			
11	3	3/25	3/26	3/28	3/28	3/29	3/30	4/1	11	11	11
		+19	+19	+19	+19	+19	+19	-11			
12	4	4/13	4/14	4/16	4/16	4/17	4/18	3/21			
		-11	-11	-11	-11	-11	-11	+18			
13	5	4/2	4/3	4/5	4/5	4/6	4/7	4/8			
		-11	-11	-11	-11	-11	-11	-11			
14	6	3/22	3/23	3/25	3/25	3/26	3/27	3/28	14	14	14
		+19	+19	+19	+19	+19	+19	+19			
15	7	4/10	4/11	4/13	4/13	4/14	4/15	4/16			
		-11	-11	-11	-11	-11	-11	-11			
16	8	3/30	3/31	4/2	4/2	4/3	4/4	4/5	16		
		+19	+19	-11	-11	-11	-11	-11			
17	9	4/18	4/19	3/22	3/22	3/23	3/24	3/25		17	17
		-11	-11	+18	+19	+19	+19	+19			
18	10	4/7	4/8	4/9	4/10	4/11	4/12	4/13			
		-11	-11	-11	-11	-11	-11	-11			
19	11	3/27	3/28	3/29	3/30	3/31	4/1	4/2	19	19	19

In 166 AD, the latest 19-year sequence began on 4-19, and Pentecost would be about 91 days later, on about 6-20, the last day of spring (against the Gregorian calendar). This sequence would repeat until a calendar correction on 3-21, 394 AD, which would return the sequence back to 3-21 and prevent Pentecost from ever being in the summer. This correction would be needed again every 342 years, in 737, 1078, 1420, 1762 and 2104 AD.

The latest Passover would be on about 5-03 (4-19 + 14), and earliest would be on about 4-03 (3-21 + 14).

In contrast, the Easter cycle began years as early as 15 days before the spring equinox, and Passover could be as early as one day before the equinox on 3-21 (against the Gregorian calendar).

Delaying the 19-year cycle (from 4-01+19=4-20 into 4-01-11=3-21) to Correct the Gregorian calendar every 342 yrs

TABLE 5. Converting 4-20 into 3-21 after every 342 years

228 yrs	228 yrs			
3-30	**3-31**	4-01	4-01	
		+19	-11	
4-18	4-19	**4-20**	**3-21**	< With the delay
		-11	+19	19 delayed or 19 and 11 reversed
4-07	4-08	4-09	4-09	< Without the delay

This chart illustrates how the mismatch between the 12 x 19-yr. Gregorian calendar years and the 235 x 12 lunations in 228 years. The Gregorian has 83,275.29 days in 228 years and needs one day every 228 years to match the Metonic.

The Metonic lunar-solar calendar has 365.2467463 days per solar year. The number of days in 19 years can be compared with the days in 235 moons in 19 years. It has 83,276.256 days in 228 years (83,276 - 86,275 = 1).

TABLE 6. Conversion from Julian Calendar to Gregorian Calendar

Julian Calendar 1st New Moon (Nisan 1) in each 228 years (19 x 12)		Revised Gregorian Calendar 1st New Moon (Nisan 1) in each 228 years (19 x 12)	
		Correction in AD 394	
Era of Nabonassar	747	4-15	
	519	4-16	
	291	4-17	
	BC 63	4-18	
3-21	AD 166	4-19	Delay from 4-19 to 3-21
3-20	394	3-21	
3-19	622	3-22	1368 yrs
3-19	850	3-23	
3-18	1078	3-24	
3-17	1306	3-25	
3-16	1534	3-26	
3-16	1762	3-27	
3-15	1990	3-28	1368 yrs
			13 days of correction since 747 BC

The Julian loses one day every 128 years against the tropical solar calendar.
The Gregorian loses one day every 3300 years against the tropical solar calendar.

Full Moons on the Equinox (on 3-21)

Debates arose over when a calendar should begin a 19-year cycle. To simplify matters, we'll refer to the Gregorian equinox (3-21) instead of the Julian equinox (3-23).

1. One side preferred to align a new moon with the spring equinox, and the first full moon (for Passover) would be 14 days later, on April 4. The next new moon would be on April 19, and the latest full moon (for Passover) would be 14 days later, on May 3. In 166 AD, the 19-years began on the latest date, on 4-19, and this would place Pentecost on about March 20, on the last day of spring and would be on the first day of summer. Therefore, the Gregorian calendar needs correction in 394 AD by changing 4-20 into 3-21 (as in TABLE 4).

2. The other side preferred to align a full moon with the spring equinox (March 21) after the year had begun 14 days earlier. The earliest Passover could be on the equinox, March 21, in which case, the next full moon would be 29 days later, on April 19. All full moons would be between March 21 and April 19. This often placed the Passover very early

in the grain harvest season.

If the 19-year cycle began 14 days before the full moon that aligned with the spring equinox, then this sets up a pattern for 19-year sequence for all full moons. Simply substitute the same pattern used for the calendar of new years beginning on the spring equinox. On the Gregorian calendar, this sequence would be on 3-21, 4-09, 3-29, 4-17, 4-05, 3-25, 4-13, 4-02, 3-22, 4-10, 3-30, 4-18, 4-07, 3-27, 4-15, 4-04, 3-24, 4-12, and 4-01.

Moreover, the earliest rabbinical calendar year likely began on Nisan 1 (on March 6) 177 days before the civil fall calendar began on Tishri 1 (August 24). This helps explain why the year one of the Hebrew calendar is year 9 of the Babylonian calendar. One begins with the full moon on the equinox. The other begins with the new moon on the equinox. One begins in the fall. The other begins in the spring.

Eventually, the Julian calendar was found to have gained one day against the seasons (the equinox) every 128 years since the Nicean Counsel in 325 AD and was corrected by using the Gregorian calendar in the 13 colonies of America after 1752 AD, in the time of George Washington.