November 1999

Frank W. Nelte

THE LENGTH OF TIME BETWEEN THE NEW MOONS OF THE 1ST AND THE 7TH MONTHS

Since the Jewish molads are woefully inaccurate in determining the new moons, we need to have correct information regarding the new moons in order to make some sound decisions.

The following data is taken from the book "ASTRONOMICAL TABLES OF THE SUN, MOON, AND PLANETS" by Jean Meeus, and published by Willmann-Bell Inc. of Richmond. VA, USA.

The data presented here covers the years 2000 - 2025.

In all cases I have added 2 hours 20 minutes to express the times for local Jerusalem time (35 degrees east).

For those years where the Jewish calendar starts Nisan 1 before the end of winter (i.e. before March 20), I have given the data for the next new moons (i.e. the correct new moons).

Specifically, what is needed is:

1) The correct new moon date & time for the first month

2) 1st Day of the 1st Month

3) The correct new moon date & time for the seventh month

4) 1st Day of the 7th Month

5) The number of days in the first 6 months

The date given for "1st Day of the 1st Month" is the day that starts with the sunset AFTER the conjunction; and the date given for "1st Day of the 7th Month" is the day that starts with the sunset AFTER the 7th new moon. This rule is followed consistently irrespective of which days of the week may be involved.

Keep in mind that if the time is between 6:00 p.m. and midnight, then it is already a part of the next day. For example: a new moon on April 4 at 8:33 p.m. is a new moon on April 5 when reckoning days from sunset to sunset. And April 6, which starts at sunset on April 5, is the next day.

THE YEAR 2000

New moon 1st Month: April 4 8:33:03 p.m.

Day 1 of 1st Month: April 6

New moon 7th Month: September 27 10:14:00 p.m.

Day 1 of 7th Month: September 29

Number of days in the first 6 months: 176 days

THE YEAR 2001

New moon 1st Month: March 25 3:42:03 a.m.

Day 1 of 1st Month: March 26

New moon 7th Month: September 17 12:48:25 p.m.

Day 1 of 7th Month: September 18

Number of days in the first 6 months: 176 days

THE YEAR 2002

New moon 1st Month: April 12 9:42:12 p.m.

Day 1 of 1st Month: April 14

New moon 7th Month: October 6 1:38:37 p.m.

Day 1 of 7th Month: October 7

Number of days in the first 6 months: 176 days

THE YEAR 2003

New moon 1st Month: April 1 9:39:46 p.m.

Day 1 of 1st Month: April 3

New moon 7th Month: September 26 5:30:15 a.m.

Day 1 of 7th Month: September 27

Number of days in the first 6 months: 177 days

THE YEAR 2004

New moon 1st Month: March 21 1:02:24 a.m.

Day 1 of 1st Month: March 22

New moon 7th Month: September 14 4:50:06 p.m.

Day 1 of 7th Month: September 15

Number of days in the first 6 months: 177 days

THE YEAR 2005

New moon 1st Month: April 8 10:53:05 p.m.

Day 1 of 1st Month: April 10

New moon 7th Month: October 3 12:48:56 p.m.

Day 1 of 7th Month: October 4

Number of days in the first 6 months: 177 days

THE YEAR 2006

New moon 1st Month: March 29 12:36:20 p.m.

Day 1 of 1st Month: March 30

New moon 7th Month: September 22 2:06:06 p.m.

Day 1 of 7th Month: September 23

Number of days in the first 6 months: 177 days

THE YEAR 2007

New moon 1st Month: April 17 1:57:06 p.m.

Day 1 of 1st Month: April 18

New moon 7th Month: October 11 7:21:42 a.m.

Day 1 of 7th Month: October 12

Number of days in the first 6 months: 177 days

THE YEAR 2008

New moon 1st Month: April 6 6:16:23 a.m.

Day 1 of 1st Month: April 7

New moon 7th Month: September 29 10:33:18 a.m.

Day 1 of 7th Month: September 30

Number of days in the first 6 months: 176 days

THE YEAR 2009

New moon 1st Month: March 26 6:27:00 p.m.

Day 1 of 1st Month: March 28

New moon 7th Month: September 18 9:05:23 p.m.

Day 1 of 7th Month: September 20

Number of days in the first 6 months: 176 days

THE YEAR 2010

New moon 1st Month: April 14 2:50:00 p.m.

Day 1 of 1st Month: April 15

New moon 7th Month: October 7 9:05:33 p.m.

Day 1 of 7th Month: October 9

Number of days in the first 6 months: 177 days

THE YEAR 2011

New moon 1st Month: April 3 4:53:25 p.m.

Day 1 of 1st Month: April 4

New moon 7th Month: September 27 1:29:46 p.m.

Day 1 of 7th Month: September 28

Number of days in the first 6 months: 177 days

THE YEAR 2012

New moon 1st Month: March 22 4:58:12 p.m.

Day 1 of 1st Month: March 23

New moon 7th Month: September 16 4:31:44 a.m.

Day 1 of 7th Month: September 17

Number of days in the first 6 months: 178 days

THE YEAR 2013

New moon 1st Month: April 10 11:56:24 a.m.

Day 1 of 1st Month: April 11

New moon 7th Month: October 5 2:55:37 a.m.

Day 1 of 7th Month: October 6

Number of days in the first 6 months: 178 days

THE YEAR 2014

New moon 1st Month: March 30 9:05:47 p.m.

Day 1 of 1st Month: 1 April

New moon 7th Month: September 24 8:34:52 a.m.

Day 1 of 7th Month: September 25

Number of days in the first 6 months: 177 days

THE YEAR 2015

New moon 1st Month: March 20 11:57:18 a.m.

Day 1 of 1st Month: March 21

New moon 7th Month: September 13 9:02:22 a.m.

Day 1 of 7th Month: September 14

Number of days in the first 6 months: 177 days

THE YEAR 2016

New moon 1st Month: April 7 1:44:47 p.m.

Day 1 of 1st Month: April 8

New moon 7th Month: October 1 2:32:28 a.m.

Day 1 of 7th Month: October 2

Number of days in the first 6 months: 177 days

THE YEAR 2017

New moon 1st Month: March 28 5:18:21 a.m.

Day 1 of 1st Month: March 29

New moon 7th Month: September 20 7:50:59 a.m.

Day 1 of 7th Month: September 21

Number of days in the first 6 months: 176 days

THE YEAR 2018

New moon 1st Month: April 16 4:18:16 a.m.

Day 1 of 1st Month: April 17

New moon 7th Month: October 9 6:07:58 a.m.

Day 1 of 7th Month: October 10

Number of days in the first 6 months: 176 days

THE YEAR 2019

New moon 1st Month: April 5 11:11:37 a.m.

Day 1 of 1st Month: April 6

New moon 7th Month: September 28 8:47:29 p.m.

Day 1 of 7th Month: September 30

Number of days in the first 6 months: 177 days

THE YEAR 2020

New moon 1st Month: March 24 11:49:21 a.m.

Day 1 of 1st Month: March 25

New moon 7th Month: September 17 1:21:20 p.m.

Day 1 of 7th Month: September 18

Number of days in the first 6 months: 177 days

THE YEAR 2021

New moon 1st Month: April 12 4:51:59 a.m.

Day 1 of 1st Month: April 13

New moon 7th Month: October 6 1:26:31 p.m.

Day 1 of 7th Month: October 7

Number of days in the first 6 months: 177 days

THE YEAR 2022

New moon 1st Month: April 1 8:45:33 a.m.

Day 1 of 1st Month: April 2

New moon 7th Month: September 26 00:15:42 a.m.

Day 1 of 7th Month: September 27

Number of days in the first 6 months: 178 days

THE YEAR 2023

New moon 1st Month: March 21 7:44:17 p.m.

Day 1 of 1st Month: March 23

New moon 7th Month: September 15 4:00:56 a.m.

Day 1 of 7th Month: September 16

Number of days in the first 6 months: 177 days

THE YEAR 2024

New moon 1st Month: April 8 8:42:01 p.m.

Day 1 of 1st Month: April 10

New moon 7th Month: October 2 9:10:23 p.m.

Day 1 of 7th Month: October 4

Number of days in the first 6 months: 177 days

THE YEAR 2025

New moon 1st Month: March 29 1:18:59 p.m.

Day 1 of 1st Month: March 30

New moon 7th Month: September 21 10:15:15 p.m.

Day 1 of 7th Month: September 23

Number of days in the first 6 months: 177 days

NUMBER OF DAYS IN THE FIRST 6 MONTHS FOR THE ABOVE YEARS:

2000 = 176 days 2001 = 176 days 2002 = 176 days

2003 = 177 2004 = 177 2005 = 177

2006 = 177 2007 = 177 2008 = 176

2009 = 176 2010 = 177 2011 = 177

2012 = 178 2013 = 178 2014 = 177

2015 = 177 2016 = 177 2017 = 176

2018 = 176 2019 = 177 2020 = 177

2021 = 177 2022 = 178 2023 = 177

2024 = 177 2025 = 177

HOW LONG BEFORE SUNSET ARE THE NEW MOON CONJUNCTIONS?

Assuming 6:00 p.m. as local sunset time in Jerusalem for dates around March/April and around September/October, purely for calculation purposes, we have the following picture for the next 26 years:

We are interested in HOW LONG before the next sunset the new moons occurs. It could be anywhere from a few minutes to almost 24 hours. But let's see the actual facts.

2000 = 1st month = over 21 hours; 7th month = over 19 hours

2001 = 1st month = over 14 hours; 7th month = over 5 hours

2002 = 1st month = over 20 hours; 7th month = over 4 hours

2003 = 1st month = over 20 hours; 7th month = over 12 hours

2004 = 1st month = over 16 hours; 7th month = about 70 minutes

2005 = 1st month = over 19 hours; 7th month = over 5 hours

2006 = 1st month = over 5 hours; 7th month = about 4 hours

2007 = 1st month = over 4 hours; 7th month = over 10 hours

2008 = 1st month = over 11 hours; 7th month = over 7 hours

2009 = 1st month = over 23 hours; 7th month = over 20 hours

2010 = 1st month = over 3 hours; 7th month = over 20 hours

2011 = 1st month = 67 minutes; 7th month = over 4 hours

2012 = 1st month = 62 minutes; 7th month = over 13 hours

2013 = 1st month = over 6 hours; 7th month = over 15 hours

2014 = 1st month = over 20 hours; 7th month = over 9 hours

2015 = 1st month = over 6 hours; 7th month = about 9 hours

2016 = 1st month = over 4 hours; 7th month = over 15 hours

2017 = 1st month = over 12 hours; 7th month = over 10 hours

2018 = 1st month = over 13 hours; 7th month = about 12 hours

2019 = 1st month = over 6 hours; 7th month = over 21 hours

2020 = 1st month = over 6 hours; 7th month = over 4 hours

2021 = 1st month = over 13 hours; 7th month = over 4 hours

2022 = 1st month = over 9 hours; 7th month = over 17 hours

2023 = 1st month = over 22 hours; 7th month = about 14 hours

2024 = 1st month = over 21 hours; 7th month = over 20 hours

2025 = 1st month = over 4 hours; 7th month = over 19 hours

So the new moon conjunctions take place AS EARLY AS 62 minutes before sunset (in 2012 A.D.) and AS LATE AS 27 minutes after sunset (i.e. 23 hours and 33 minutes before the NEXT sunset, in 2009 A.D.). MOSTLY the new moons occur between 4 hours and 20 hours before the next sunset (local Jerusalem time).

ACTUAL LENGTH OF THE FIRST 6 LUNAR CYCLES:

From the 1st to the 7th new moons may be as short as 176 days 1 hour 40 minutes 57 seconds in 2000 A.D..

It may be as long as 177 days 14 hours 59 minutes 13 seconds in 2013 A.D.

Thus the fluctuations in the lengths of the first 6 new moons may be as much as 37 HOURS 18 MINUTES 16 SECONDS! This is more than one-and-one-half days!

ASSESSING THE ABOVE DATA:

The data presented in the astronomical tables by Jean Meeus can be taken as being quite accurate, with an error margin of perhaps a few seconds. It is based on the same calculations that are employed when sending satellites and manned spacecraft into space.

The data clearly confronts us with the reality that all lunations are NOT of the same duration. Even at the same time of the year (i.e. from March/April to September/October) they vary from one year to the next, even by as much as 37 hours for those 6 lunations.

We, in our desire to set up systems that follow ordered rules, may be tempted to resort to using "averages". It is clear that, whatever system we may use, we will have to establish SOME rules. The question is only: exactly what rules are desirable?

QUESTION:

What is more important to us:

TO HAVE THE START OF THE FIRST & THE SEVENTH MONTH CORRECTLY LINKED TO THE

ACTUAL NEW MOONS FOR THOSE MONTHS? OR DO WE ONLY ACCURATELY CALCULATE THE NEW MOON OF THE FIRST MONTH AND THEN ALWAYS ADD A FIXED NUMBER OF DAYS FOR THE FIRST SIX MONTHS?

IF the start of the 1st month (for Passover and Days of UB dates) and the start of the 7th month (for Trumpets, Atonement, Tabernacles, and Last Great Day dates) are linked to the actual new moon dates, THEN those first 6 months will sometimes have 176 days, sometimes 177 days and sometimes 178 days. Which of those first 6 months have 30 days and which have only 29 days is really immaterial and does not affect the timing of any Holy Days.

IF we were to adopt a system of always having a fixed number of days in the first 6 months (e.g. as is the case in the present Jewish calendar), THEN we may for the 7th month, the Day of Trumpets, sometimes be at variance with the actual new moons, sometimes a day too early (when those 6 lunations take up 177 days and 15 hours), and at other times a day too late (when those 6 lunations only take up 176 days and 1 hour and 40 minutes).

Scientific knowledge today enables us to accurately predict all new moons to an accuracy of within a few seconds, and this REMOVES THE NEED FOR A SYSTEM OF OUR OWN FOR PREDICTING NEW MOONS! In our age the Jewish system of predicting the molads, which often contains an error of 15 hours, is not needed; it has been replaced by highly accurate prediction tables.

Realize that IF such accurate prediction tables for the new moons had been available to the Jews, then they NEVER would have resorted to establishing a system based on AVERAGES. The only reason they resorted to using averages was because they did not have the means to accurately predict future lunations of constantly varying lengths. We today can see that their "averages" will vary from being as much as 15 hours TOO LATE, to at other times being almost 4 hours TOO EARLY!

So I believe that we need to base BOTH, the start of the 1st month (for Passover, Days of UB and Pentecost) and the start of the 7th month (for Trumpets, Atonement, etc.) on the actual new moons, and not on fictitious "molads". For us today there is no value in the Jewish calculations of the molads. We must use the data for the REAL new moons, which is readily available.

And I would suggest that we CONSISTENTLY start the 1st Day of the 1st Month, and also the 1st Day of the 7th Month, with the sunset that FOLLOWS the respective new moon conjunctions. This avoids the need for involved rules of postponing when, for example, the new moon takes place only 62 minutes before sunset.

Frank W. Nelte