Frank W. Nelte

JEWISH CALENDAR TUTORIAL WORKSHEET 1 (515BC TODAYS SEQUENCE)

YEAR BEING CALCULATED: 515 B.C. TODAY'S SEQUENCE

COMMENTS: WHEN YOU TRY TO ESTABLISH JEWISH CALENDAR DATES FOR B.C. YEARS, THEN THE WHOLE EXERCISE IS TOTALLY HYPOTHETICAL. THE JEWS THEMSELVES DON'T EVER ATTEMPT TO EXTRAPOLATE THEIR PRESENT CALENDAR BACK INTO B.C. DATES, BECAUSE THEY KNOW THAT BACK THEN VISUAL OBSERVATION OF THE NEW CRESCENTS WAS THE DECIDING FACTOR IN ESTABLISHING THE START OF EVERY MONTH OF THE YEAR, AND THE PRESENT CALENDAR AND ITS RULES WERE NOT USED AT ALL.

HOWEVER, AMONGST THOSE THAT ENGAGE IN THE EXERCISE OF EXTRAPOLATING THE PRESENT JEWISH CALENDAR BACK INTO B.C. DATES, INVARIABLY WITH A MOTIVATION OF WANTING TO SUPPORT SOME POSITION OR OTHER THAT THEY HAVE TAKEN, THERE ARE TWO SCHOOLS OF THOUGHT.

ONE APPROACH IS TO SIMPLY EXTRAPOLATE BACK TO SUCH YEARS (e.g. 515 B.C.) BY EMPLOYING THE SAME SEQUENCE OF LEAP YEARS WITHIN EVERY 19-YEAR CYCLE THAT IS EMPLOYED BY THE JEWISH CALENDAR TODAY. PEOPLE WHO USE THIS APPROACH ARE TYPICALLY OBLIVIOUS TO THE EMBARRASSING RESULTS THIS WILL VERY OFTEN PRODUCE ... LIKE PLACING THE ENTIRE FEAST OF TABERNACLES WELL INTO SUMMER, AND PLACING THE PASSOVER AND THE ENTIRE FEAST OF UNLEAVENED BREAD WELL INTO WINTER. THESE RESULTS ARE SOMEWHAT OBSCURED BY THE USE OF THE JULIAN CALENDAR FOR THOSE YEARS, BUT IT IS EASY TO EXPOSE THESE PROBLEMS.

THE SECOND AND MORE COMMON APPROACH IS VERY MUCH AWARE OF THE EMBARRASSING RESULTS ACHIEVED BY THE PRESENT SEQUENCE OF LEAP YEARS FOR SUCH DATES. HOWEVER, THEY STILL WANT TO SEE THE PRESENT JEWISH CALENDAR GO BACK INTO THE CENTURIES B.C., LIKEWISE WITH A DESIRE TO ESTABLISH SOME AUTHORITY FOR THE PRESENT JEWISH CALENDAR. SO THEY HAVE DECIDED TO SIMPLY ALTER THE SEQUENCE OF LEAP YEARS WITHIN THE 19-YEAR CYCLE FOR SUCH B.C. DATES. THE RESULT IS THAT, FOR THOSE YEARS THAT CLEARLY START FAR TOO EARLY WITH THE PRESENT SEQUENCE OF LEAP YEARS, THEY ATTEMPT TO SELECT THE FOLLOWING NEW MOON TO START THE YEAR. IN THAT WAY THE RESULTS LOOK FAR MORE REASONABLE AND FAR MORE ACCEPTABLE.

IN THIS TUTORIAL I WILL DEMONSTRATE THIS SITUATION. WE WILL FIND THE JEWISH CALENDAR DATES FOR 515 B.C. BY USING BOTH METHODS.

IN THIS EXAMPLE HERE WE WILL USE TODAY'S SEQUENCE OF LEAP YEARS, WHICH IS YEARS 3, 6, 8, 11, 14, 17, 19. IN THE COMPANION TUTORIAL FOR 515 B.C. WE WILL USE THE ALTERNATE SEQUENCE OF LEAP YEARS, WHICH IS 2, 5, 7, 10, 13, 16, 18. (THESE NUMBERS REFER TO THE YEARS WITHIN EVERY 19-YEAR CYCLE.)

AFTERWARDS WE CAN COMPARE THE RESULTS ACHIEVED.

SO LET'S START WITH OUR CALCULATIONS OF THE JEWISH CALENDAR FOR 515 B.C., USING

TODAY'S SEQUENCE OF LEAP YEARS.

PART I: CALCULATION OF THE DAY OF THE WEEK FOR THE MOLAD

1.
STARTING DATE YEAR: 3761 B.C.
STARTING DATE MOLAD OF TISHRI: OCTOBER 7 or SEPTEMBER 37
STARTING DATE EXACT TIME:D2 H5 P204

2.
YEAR BEING CALCULATED:515 B.C.

3.
THE DIFFERENCE IN YEARS:3761 - 515 = 3246 YEARS

4.
CONVERT THIS DIFFERENCE INTO THE NUMBER OF 19-YR CYCLES
PLUS REMAINING COMMON YEARS AND LEAP YEARS:
3246 / 19 = 170 cycles plus a remainder of 16 years
The sequence of leap years today is: 3, 6, 8, 11, 14, 17, 19
Therefore the remainder of 16 years = 11 Common Years + 5 Leap Years

5.
CALCULATE THE DIFFERENCE BETWEEN THESE TWO DATES TO FIND THE CORRECT DAY OF THE WEEK FOR THE MOLAD.

COMMENT: For calculation purposes turn all periods of time into "Parts". The numbers will be larger, but the calculating processes will be much easier. In large numbers every 3 digits are separated by commas for easier recognition of the numbers.
See also the Data File for the actual data needed here for the calculations.

6.
FIRST CONVERT ALL PERIODS OF TIME INTO PARTS.

A.PER CYCLE: A Jewish 19-Year Cycle exceeds a full number of weeks by 2 Days 16 Hours 595 Parts. This is written as 2D 16H 595P.
THUS: 2D = 2x24 = 48 HOURS plus 16 HOURS = 64 HOURS
64 x 1080 = 69120 PARTS plus 595P = 69,715P

B.PER COMMON YEAR: A common year exceeds a full number of weeks by 4 Days 8 Hours 876 Parts. This is written as 4D 8H 876P.
THUS: 4D x 24 = 96H plus 8H = 104H
104 x 1080 = 112320 PARTS plus 876P = 113,196P

C.PER LEAP YEAR: A (Jewish) leap year exceeds a full number of weeks by 5 Days 21 Hours 589 Parts. This is written as 5D 21H 589P.
THUS: 5D x 24 = 120H plus 21H = 141H
141 x 1080 = 152280 PARTS plus 589P = 152,869P

7.
NOW WE CAN START WITH THE CALCULATIONS FOR OUR YEAR.

A. FOR THE NUMBER OF CYCLES:
170 x 69,715P = 11,851,550P

B. FOR THE COMMON YEARS:
11 x 113,196P = 1,245,156P

C. FOR THE LEAP YEARS:
5 x 152,869P = 764,345P

8.
TOTAL UP THESE 3 AMOUNTS OF TIME:
11,851,550 + 1,245,156 + 764,345 = 13,861,051P

9.
CONVERT THE RESULT BACK INTO "WEEKS, DAYS, HOURS, PARTS":
13,861,051 / 1080 = 12,834 HOURS plus 331P
12,834 / 24 = 534 DAYS plus 18H
534 / 7 = 76 WEEKS plus 2D

10.
FROM THIS RESULT DISCARD THE FULL NUMBER OF WEEKS: THUS THE RESULT IS: 2D 18H 331P

11.
ADD THIS REMAINDER TO THE STARTING DATE: D2 H5 P204 plus 2D 18H 331P = D4 H23 P535

12.
IF THE TOTAL IS 8 DAYS OR MORE, THEN DISCARD 7 DAYS, OTHERWISE KEEP THIS RESULT: D4 H23 P535

13.
THE RESULT YOU HAVE IS THE DAY OF THE WEEK AND THE EXACT TIME OF THAT DAY FOR THE JEWISH MOLAD OF TISHRI FOR THIS YEAR.

14.
ENTER THE RESULT HERE IN THE FORMAT: D H P: D4 H23 P535
THIS IS EQUAL TO: WEDNESDAY, 5:29:43 p.m.

[Comment: Day 1 = Sunday, Day 7 = Saturday; H0 = 6:00 p.m., H6 = midnight; H12 = 6:00 a.m., etc.]

You have now completed the first part of the calculation of the Molad for the year 515 B.C.. That wasn't very difficult, was it? Make a note of the HOURS and PARTS in this result. (i.e. the H23 P535)

[Comment: In programs that reckon days from midnight to midnight this will appear as H17 P535.]

Proceed to the next page: Page 2