

13. Therefore, if you have as one assured datum the time of the conjunction of the beginning of a cycle and add to it 2d 16h 595p, you will obtain the beginning of the following cycle; and in the same manner you will find the (first) conjunction of each successive cycle, up to the end of time. And we have already mentioned that the conjunction at the start of the *first* cycle occurred on 2d 5h 204p (above, Sec. 8).

The conjunction of a year means the conjunction of the month Tishri of that year.

14. By this method you can find the conjunction of any given year or any given month, past or future. The procedure is as follows: Take the number of the complete years which have elapsed from the creation of the world up to the month of Tishri of the year in question, convert them into cycles of 19 years, and make a note of the number of cycles which have elapsed and of the number of years which have elapsed of the last, as yet incomplete, cycle. Then take for each cycle 2d 16h 595p; take for each ordinary year in the not yet completed cycle 4d 8h 876p; and take for each embolismic year 5d 2h 589p; sum all these up (and add the sum total to 2d 5h 204p [Sec. 8]). Then convert the parts into hours, the hours into days, and the days into weeks and discard the weeks; the remaining balance of days, hours, and parts is the sought-for time of the conjunction of the year.

15. The conjunction of the year which you obtain by this method of calculation is the conjunction of the month of Tishri. If you add to it 1d 12h 793p, you obtain the conjunction of Marḥeshwan (Sec. 5); if you add to that of Marḥeshwan 1d 12h 793p, you obtain the conjunction of Kislew, and so on for each following month to the end of time.

CHAPTER VII

1. According to this method of calculation, the New Moon Day of Tishri is never allowed to be on a Sunday, a Wednesday, or a

Friday—in numerals: 1-4-6; but if the conjunction of Tishri falls upon one of these three days, the *following* day is declared to be New Moon Day. Thus if the conjunction falls on a Sunday, New Moon Day is postponed to Monday; if the conjunction falls on a Wednesday, it is postponed to Thursday; and if the conjunction falls on a Friday, it is postponed to Saturday.

2. Another postponement is this: if the conjunction (of Tishri) occurs at noon or later, New Moon Day is declared to be the following day. Thus, if the conjunction occurs on Monday at noon or later, Tuesday is made to be New Moon Day. But if the conjunction occurs before noon, even if by only one "part," this very day of the conjunction is declared as New Moon Day—provided, however, that that day is not 1, 4, or 6.

3. If the conjunction occurs at noon or later, so that New Moon Day is postponed to the following day, and this following day happens to be one of the days 1, 4, 6, it is further postponed to the next following day, so that the third day, counting from the day of the conjunction, is made to be New Moon Day.

Thus, if the conjunction (of Tishri) occurs on a Saturday at noon—in numerals: at 7d 18h—the New Moon Day of Tishri, of a year which has such a conjunction, is set to be the following Monday. Similarly, if the conjunction occurs on a Tuesday at noon or later, the following Thursday is declared to be the first day of the month (and of the year).

4. (Other postponements:) If, according to this method of calculation, the conjunction of Tishri occurs on the night of Tuesday, namely in the ninth hour of the night and two hundred and four parts of the tenth hour—in numerals: 3d 9h 204p—or later, and the year is an ordinary year, New Moon Day is postponed (for two days), so that in such a year not Tuesday but Thursday is made to be the first day of Tishri.

5. Similarly, if the conjunction of Tishri occurs on a Monday, in three hours of daytime and five hundred and eighty-nine parts of the fourth hour—in numerals: 2d 15h 589p—or later, and this

year follows an embolismic year, that is, if the preceding year was an embolismic year, then, in such a year, not Monday but Tuesday is set to be New Moon Day.

6. If the conjunction of an ordinary year that, as we have just stated (Sec. 4), requires postponement of the New Moon Day until Thursday occurs only one part *less* than the time mentioned—so that it occurs on 3d 9h 203p or earlier—then New Moon Day is declared to be on Tuesday. Similarly, if the conjunction of a year following an embolismic year occurs only one part earlier than stated above (Sec. 5)—so that it occurs on 2d 15h 588p or sooner—then New Moon Day is declared to be on Monday.

In sum, the procedure in setting the New Moon Day of Tishri according to this method of calculation is as follows:

First you ascertain by computation the day on which the *molaḏ* would occur, also the hour of the day or the night and the parts of the hour.

As a rule, *the day of the molaḏ is the day of declaration* (that is, the day of conjunction is normally declared to be New Moon Day), except in the following four cases (of Tishri):

- (i) if the conjunction falls on a Sunday, Wednesday, or Friday
- (ii) if it occurs at noontime or later
- (iii) if it occurs at 204 parts of the 10th hour, or later, on the night of Tuesday, and the year is an ordinary year
- (iv) if it occurs at 589 parts of the 4th hour of the day on Monday, and the year is an ordinary year following an embolismic year.

If the conjunction falls at any of these four periods, New Moon Day (of Tishri) is declared to be not on the day of the *molaḏ* but on the following day or on the day after the following day, as we have explained.

7. Why does this method of calendaric calculation eliminate 1, 4, 6 from being declared as New Moon Days (of Tishri)? Because this method reckons with the conjunction of the moon and the sun based not upon their true position but only upon their mean motion, as we have pointed out above (vi, 1). Therefore

(as regards the molad of Tishri) days of (normal) declaration are made to alternate with days of postponement, in order to hit upon the day of true conjunction. Thus: if the conjunction falls on a Tuesday, Tuesday is "declared" (as New Moon Day), and if on a Wednesday, "postponement" is made; if on a Thursday, Thursday is declared, and if on a Friday, postponement is made; if on a Saturday, Saturday is declared, and if on a Sunday, postponement is made; if on a Monday, Monday is declared.

8. At the root of all those four postponements (Sec. 6) lies the reason just stated, namely, that our computations are based upon the mean motion. And the following is proof of this statement: When the conjunction occurs during the night of Tuesday—yet New Moon Day is postponed until Thursday—it frequently happens that the new crescent will not be visible either on the night of Thursday or even on the night of Friday. Hence we must realize that the sun and the moon did not enter true conjunction except on Thursday (or on Friday).

CHAPTER VIII

1. As we have already pointed out (vi, 3), the lunar month comprises $29\frac{1}{2}$ days and 793 parts. However, we cannot think that the month should begin in the middle of the day, so that one part of the day would belong to the past month while the other part would belong to the next month; for it is said: *A month of days* (Num. 11:20), and by tradition the Sages have interpreted this verse to imply that the month is to be counted by days, not by hours.

2. Accordingly, the lunar months have been adjusted to represent an alternate succession of one defective and one full month. The defective month consists of 29 days only, although the lunar month is several hours longer; and the full month consists of 30 days, although the lunar month is some hours shorter. The reason