

## Chapter 11

1 From what has been stated in the preceding paragraphs (I, 6; II, 4; VI, 1), that the court used to engage in accurate calculations in order to ascertain whether or not the new crescent could be visible (on the eve of the 30<sup>th</sup> day of the month), we realize that any person with an alert spirit and curiosity for these delicate and hidden matters of scientific knowledge should be eager to learn about the methods of calculation which enable one to ascertain whether the new crescent might or might not be visible on that night.

2 As to these methods of calculation, many and great are the dissensions among the sages of the ancient peoples who used to engage in the study of astronomy and mathematics. Some great scholars blundered and overlooked certain things, and they were therefore beset by doubts. Other scholars conducted much research, yet missed the right way of performing the calculations pertaining to the visibility of the new moon: "they dived into mighty waters and came back with a potsherd in their hands."

3 In the long run,. However, and after a great deal of observation and research, some scholars did find the correct methods for these calculations. Moreover, we have traditions, handed down by the sages, concerning these propositions and proofs that are not found recorded in books that are commonly accessible. Therefore I have deemed it fit to expound here the methods of these calculations in order to make them available to "every one whose heart stirred him up to come to the work to do it" (Ex. 36:2).

4 You should not, however, make light of these methods because of the fact that at the present age we no longer depend on them; for these methods are indeed remote and deep, and they constitute the Secret of the Calendar, which was known only to the great sages and which they were not permitted to reveal to anyone except to ordained and sagacious (disciples). On the other hand, the calculations which we use (for the fixed calendar) today, when there is no court qualified to proclaim the new month according to observation, are such that even schoolchildren can learn and fully grasp them in three or four days.

5 Some (readers of this book) who have studied Greek science, be they Gentile scholars or Jewish scholars, will perhaps notice that some of the methods used by me for the calculation of the visibility of the new moon operate by more or less close approximation, and they would suspect that this is due to inadvertence or ignorance on our part. Let them not give room to such a suspicion; for if we have not striven for complete exactitude (in our computations), it was only because we knew by positive mathematical proofs that such a procedure need not alarm us, since it will by no means affect the correct determination of the time of the visibility of the new moon; and this is why we have not aimed at minute exactness.

6 Similarly, should a reader observe that one or another of the methods leads to some minor shortage in the computation applicable to that method, let him realize that we have

allowed that shortage intentionally; as against this, another result, obtained by another method, yields a surplus (that will balance the shortage), so that the final result will contain the correct figure, notwithstanding that it has been obtained by approximate values. In this way we were able to avoid long and complicated calculations which are of no practical value for the determination of the visibility of the new moon, and may only lead to the confusion and bewilderment of the layman, who is not trained in such matters.

## **Chapter 17**

25 As regards the logic for all these calculations—why we have to add a particular figure or deduct it, how all these rules originated, and how they were discovered and proved—all this is part of the science of astronomy and mathematics, about which many books have been composed by Greek sages—books that are still available to the scholars of our time. But the books which had been composed by the sages of Israel, of the tribe of Issachar, who lived in the time of the prophets, have not come down to us. But since all these rules have been established by sound and clear proofs, free from any flaw and irrefutable, we need not be concerned about the identity of their authors, whether they were Hebrew prophets or Gentile sage. For when we have to do with rules and propositions which have been demonstrated by good reasons and have been verified to be true by sound and flawless proofs, we rely upon the author who has discovered them or has transmitted them only because of his demonstrated proofs and verified reasoning.

## **Chapter 18**

14 . . . But the foregoing statements . . . have only an academic value; for our purpose was merely to enumerate all the rules governing the visibility of the new moon, in order to “make the law great and glorious” (Is. 42:41).

## **Chapter 19**

13 We have now expounded all the methods of calculation required for the determination of the visibility of the new moon and for the examination of witnesses, so that discerning students might be able to learn everything about it. Thus they shall not miss this particular branch of the many branches of the Law and will have no need to roam and ramble about in other books in search of information on matter set forth in this treatise.

“Seek out of the book of the Lord and read;  
None of these [truths] shall be missing” (Is. 34:16).+