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Maimonides: Abū ʿImrān Mūsā [Moses] ibn ʿUbayd Allāh [Maymūn] al-Qurṭubī

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Born **Cordova, (Spain), 1145 or 1148**

Died **Fusṭāṭ, (Egypt), 1204**

Maimonides, the renowned Jewish theologian and physician, also wrote on the relationship between Judaism and the sciences, astronomy in particular. He spent his formative years in Spain and North Africa. He eventually settled in Fusṭāṭ, near present-day Cairo where he achieved his great fame in learning and communal leadership. Nonetheless, Maimonides remained attached to the intellectual outlook of the western part of the Islamic world throughout his life, and this is especially true of his work in astronomy. In his youthful search for guidance, especially in matters of cosmography (which were later to be a major concern), he sought out the son of **Jābir ibn Aflaḥ** as well as some pupils of **Ibn Bājja**. Indeed, his career affords us one of the clearest examples of the distinctive features of the western Islamic astronomical tradition. Maimonides contributed to the Arabic astronomical literature by editing (*i. e.*, preparing corrected versions of texts that had become problematic) books written by two of his Andalusian predecessors, the above-mentioned Jābir and Ibn Hūd, ruler of Seville.

Astronomical issues are stressed at several places in Maimonides' great work of religious thought, the *Guide of the Perplexed*. The most detailed discussion is found in Part Two, Chapter 24, which is devoted entirely to a review of the state of what may be anachronistically called cosmology or celestial physics. Aristotelian physics had established by means of what were then taken to be irrefutable proofs that the motions of the heavenly bodies must be circular, with the Earth at the center. **Ptolemy**'s models clearly violate these principles. All of the solutions that had been offered to date were critically scrutinized and rejected; these included the proposals of **Thābit ibn Qurra** and Ibn Bājja, for which Maimonides remains our only source. Did Maimonides consider the problem insoluble, or to put it differently, did he think the “true configuration” to be beyond human ken? Opinions have differed sharply on this point. It is noteworthy, however, that Maimonides breaks away from some of the Andalusians in that he does not think the solution to lie in rediscovering **Aristotle**'s cosmology. Maimonides firmly believed that astronomy had advanced considerably since Aristotle's day. Although the Stagirite's proclamations in physics remain true, his teachings in astronomy can no longer be maintained. In this respect Maimonides' position is closer to that of the Egyptian **Ibn al-Haytham**.

Maimonides' sole contribution to mathematical astronomy is his procedure for determining the visibility of the lunar crescent, which takes up several chapters of his great law code, the *Mishneh Torah*. Before the calendar was fixed, Jewish law required that the beginning of each month be certified by the court at Jerusalem. No month can exceed 30 days. Hence, if the crescent is not seen on the eve of the 29th, the declaration of the new month is automatic. Maimonides' procedure is necessary only for those instances where witnesses do report a sighting on the eve of the 29th. Specifically, the members of the court need to know whether a sighting is possible, so that they may convene in the expectation of witnesses; and they need a few details about the appearance of the crescent for purposes of cross-examination. Conversely, the court needs to know when a sighting will be impossible, so as to be able to reject any purported sightings.

With these facts in mind, it will be readily understood why Maimonides presents his method in “cookbook” fashion. Solar and lunar parameters, listed by Maimonides, can be plugged in, and the computation is then carried out step-by-step. Eventually the result is a simple yes or no answer; if the answer is yes, some additional information about the appearance of the crescent can be obtained. Theoretical explanations or justifications are kept to a bare minimum. Certain parameters, for example the geographical latitude, are built in, since the computation is meant to be true only for Jerusalem and its environs. Maimonides states that he has allowed himself some approximations, but, he assures us, the round-off errors cancel each other out, so that there is no net effect on the computation.

Maimonides issued some critically important and repercussive statements on the relationship between Judaism and the sciences, astronomy in particular. He asserted that ancient Rabbinic views on the structure of the heavens have no privileged position. The tenets of astronomy can be proven or rejected by universal and invariant rules of logic; hence their source, or, as we might say, the cultural context out of which they emerge, is irrelevant. On the other hand, astronomy is by no means a “secular” science. Knowledge of God, the attainment of which is a primary religious obligation, can be approximated – Maimonides denies that it can be fully achieved – only by inference from creation. The stars are the most noble bodies in creation, and the study of their motions is one of the most religiously fulfilling activities at our disposal.

Selected References

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Corrections/Additions