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Qunawī: Muḥammad ibn al-Kātib Sīnān al-Qunawī

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Born **Probably Istanbul, (Turkey)**

Died **Istanbul, (Turkey)**, ***circa*** **1524**

Muḥammad al-Qunawī, astronomer and *muwaqqit* (timekeeper), lived in Istanbul and pioneered the Turcification movement of the Greco–Hellenic and classical Islamic astronomical literature. Very little is known about his life. However, Qunawī's name indicates that he came from Qunya (Konya, Turkey). Sinān, his father, served in the Ottoman State Chambers as a scribe, and so he became known as Ibn Kātib Sīnān, *the son of Sinān the Scribe*.

In his work entitled *Kitāb al-aṣl al-muʿaddil*, Qunawī states that "he had met all the important astronomers of the time" (Istanbul Archeology Museum, MS 1255/4, 156b). These would have been from among his Ottoman intellectual circle of friends and students who had studied both the astronomical works of **ʿAlī al-Qūshjī**, thus connecting them with the mathematical–astronomical tradition of Samarqand, and the achievements of *ʿilm al-mīqāt* (astronomical timekeeping) of classical Islam, which had reached its apex with the works of **Khalīlī** and **Ibn al-Shāṭir** in 14th-century Damascus.

After completing his education, Qunawī worked for some time as the official *muwaqqit* in several religious institutions including the New (Yeni) Mosque in Edirne. In this capacity, he offered several works in the service of various Sultans: his *Hadiyyat al-mulūk* to Sultan Bāyazīd II, his *Faḍl al-dāʾir* to Sultan Selīm I, and his *Mīzān al-Kawākib* to Sultan Süleymān I (the Magnificent).

Qunawī wrote 11 books on astronomy: seven in Arabic and four in Turkish. Thus his works were not confined to the Turkish-speaking areas of Istanbul, the Balkans, and Anatolia, but could be used in Arabic-speaking areas, such as Cairo, Egypt, as well. Qunawī's works in Turkish provide us with insight into the growing needs of the Ottoman state bureaucracy. In fact, the word *al-Ihkwān* (usually meaning "brothers"), mentioned in the title of his Turkish book *Hadiyyat al-ihkwān*, actually refers to the *muwaqqit*s, who were part of this bureaucracy. Qunawī's Turkish writings helped inculcate an attitude among Ottoman astronomers that contributed to the translation of the Hellenic and Islamic astronomical heritage from Arabic and Persian into Turkish from the beginning of the 16th century onward and paved the way for the Turcification of the language of astronomy.

Most of Qunawī's works were devoted to timekeeping and astronomical instruments. He was thus following one particular tradition of Islamic astronomy whereby it was "in service" to religious,

administrative, and social needs of Islamic civilization that placed a high value on precise calculations (dependent upon the mathematical sciences, especially astronomy) and instruments for attaining them. These were used for regulating the prayer times, determining the *qibla* or local direction to Mecca, and ascertaining the beginning and the end of important national and religious days and months (*e. g.*, the month of Ramadan). Each locality needed its own set of tables and calculations, and Qunawī's were for the capital city of Istanbul. Among his achievements, he simplified the standard usage of astronomical instruments, especially quadrants (*al-rubʿ al-mujayyab, rubʿ al-muqanṭarāt*, and *rubʿ al-dāʾira*), and he invented a new method for astronomical calculations in his *al-Aṣl al-muʿaddil*. Qunawī also translated the introductory part of Khalīlī's *mīqāt* tables (which provided solutions to all the standard problems of spherical astronomy for all latitudes) under the title *Tarjamah-i jadāwil-i āfāqī* or *Tarjamah-i risāla fī al-awqāt al-khamsa wa-jadāwil al-raṣad*. To the group of tables that Khalīlī prepared for each degree of latitude, he added a special table for an unknown location at latitude 40° 30′ N.

In the preface to his *Tarjamah-i jadāwil-i āfāqī*, Qunawī says "some of our sons wanted, from this poor man, to learn about sine tables; and so we translated this work into Turkish ..." (Süleymaniye Library, Ayasofya MS 2594, 1b). This is an indication that he was teaching astronomy courses in the *muwaqqithāne*s (timekeeping institutions attached to mosques) and that the language for learning and education was Turkish.

Qunawī's Arabic work entitled *Mīzān al-kawākib* contains time calculation tables by means of stars; the tables have over 500 pages, and include nearly 250 million registers. The main tables show the time from sunset (evening) to sunrise, dawn, and midday for a degree of solar longitude and full vertical rise. One can simply observe a star reaching the last point instantly and also read its rise from a different table prepared by the author; one can enter solar longitude through the rise on the main table and determine the nighttime. According to D. King (1986, p. 248), these tables represent an original Ottoman contribution in determining the astronomical time *via* tables.

After his death, Qunawī's works were developed further by **Muṣṭfā ibn ʿAlī al-Muwaqqit**, the chief astronomer to Sultan Süleymān the Magnificent.

Selected References

Bağdadlı, İsmail Paşa (1955). *Hadiyyat al-ʿārifīn*. Vol. 2, p. 225. Istanbul: Milli Eg-itim Bakanlíge Yayinlari.

Brockelmann, Carl. *Geschichte der arabischen Litteratur*. 2nd ed. Vol. 2 (1949): 302–303; Suppl. 2 (1938): 327; Suppl. 3 (1942): 1275. Leiden: E. J. Brill.

Bursalı, Mehmed Tahir (1342 H [1923]). *Osmanlı Müellifleri*. Vol. 3, p. 301. Istanbul: Matbaa-i Amire.

İhsanoğlu, Ekmeleddin *et al*. (1997). *Osmanlı Astronomi Literatürü Tarihi* (*OALT*) (History of astronomy literature during the Ottoman period). Vol. 1, pp. 84–90 (no. 46). Istanbul: IRCICA.

Kātib Čelebī. *Kashf al-ẓunūn ʿan asāmī al-kutub wa-ʾl-funūn*. Vol. 1 (1941), col. 317; Vol. 2 (1943), cols. 1904, 2042. Istanbul.

King, David A. (1986). "Astronomical Timekeeping in Ottoman Turkey." In *Islamic Mathematical Astronomy*, XII. London: Variorum Reprints, pp. 247–248.

——— (1993). *Astronomy in the Service of Islam*. Aldershot: Variorum.

——— (1996). “On the Role of the Muezzin and the *Muwaqqit* in Medieval Islamic Society.” In *Tradition, Transmission, Transformation: Proceedings of Two Conferences on Pre-modern Science Held at the University of Oklahoma*, edited by F. Jamil Ragep and Sally P. Ragep, with Steven Livesey, pp. 285–346. Leiden: E. J. Brill.

Suter, H. (1981). *Die Mathematiker und Astronomen der Araber und ihre Werke*. Amsterdam: APA-Oriental Press, p. 187 (no. 455).

Uzunçarsılı, İsmail Hakkı (1982). *Osmanlı Tarihi*. Vol. 2, pp. 631, 633. Ankara: Tūrh Tarih Kurumu.