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Shirwānī: Faḥallāh ibn Abū Yazīd ibn ‘Abd al-‘Azīz ibn Ibrāhīm al-Shābarānī al-Shirwānī al-Shamāhī

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Born Shirwān, Shamāh, (Azerbaijan), 1417

Died Shirwān, Shamāh, (Azerbaijan), February 1486

The astronomer, mathematician, and teacher Faḥallāh al-Shirwānī was part of the Samarqand school of mathematics and astronomy, which was composed of scholars who pursued the mathematical sciences including astronomy. Through his works many students were educated in the sciences, thus disseminating them in the Ottoman lands, especially in Anatolia.

Shirwānī received his primary education from his father and subsequently continued his education in Serakhs and Ṭūs. In Ṭūs, Shirwānī studied **al-Sayyid al-Sharīf al-Jurjānī's** *Sharḥ al-Tadhkira fī ‘ilm al-hay’a*, a commentary on **Naṣīr al-Dīn al-Ṭūsī's** seminal work on astronomy, under the Shī‘ī scholar al-Sayyid Abū Ṭālib. In mid-1435 he left for Samarqand and studied mathematics, astronomy, Islamic theology (*kalām*), and the linguistic sciences under **Qāḍizāde** at the *madrasa* (school) of Samarqand. Among the works he studied was **Nizām al-Dīn al-Nisābūrī's** *Sharḥ al-Tadhkira fī ‘ilm al-hay’a*, yet another commentary on Ṭūsī's work. Clearly the *Tadhkira* occupied an important place in the school of Samarqand as well as in Shirwānī's education. Shirwānī received his diploma on 13 September 1440. During his education in the *madrasa*, he no doubt participated in astronomical activities, primarily the astronomical observations at the Samarqand Observatory. During his stay in Samarqand, he also wrote a commentary on a work of Islamic law, which he presented to **Ulugh Beg**.

In 1440, after his 5-year long education in Samarqand, Shirwānī returned to Shirwān where he lectured for some time at the *madrasas* there. On the advice of his former teacher Qāḍizāde, he left for Anatolia (toward the end of the reign of Sultan Murād II [reigned: 1421-1451]) and was warmly received by Çandarođlu Ismail Bey in Kastamonu. Subsequently, he started teaching in the *madrasas* there. Shirwānī lectured on mathematical and astronomical works, especially those of his teacher Qāḍizāde, and on *al-Tadhkira*. Muḥyī al-Dīn Muḥammad ibn Ibrāhīm al-Nīksārī (died: 1495) and Kamāl al-Dīn Mas‘ūd al-Shirwānī (died: 1500) were among his prominent students.

In 1453, Shirwānī dedicated a commentary (*tafsīr*) on the Qur’ān to the Ottoman Grand Vizier Çandarlı Khalīl Pasha in Bursa. That same year, he presented a work on music (a subdivision of the mathematical sciences) to Sultan Mehmed II. However, later in the year after the conquest of Istanbul, Khalīl Pasha was executed; having lost his patron, Shirwānī returned to Kastamonu. After

these events, Shirwānī wrote a work on theoretical astronomy, which was a supercommentary on Qāḏīzāde's *Sharḥ al-Mulakhkhaṣ*. This he presented to Sultan Mehmed II in the hopes of establishing closer ties with the Ottoman court, but he was unsuccessful.

In 1465, Shirwānī set off on a pilgrimage for Mecca; *en route* he continued pursuing scientific activities, first stopping in Iraq and teaching at the *madrasas* in the region. He remained in Mecca for a time, continuing to give lectures. Shirwānī returned to Istanbul, *via* Cairo. Not receiving the attention he thought his due, he returned to his hometown of Shirwān in 1478.

Shirwānī wrote works on literature and linguistics, *kalām*, music, Islamic law, Qur'ānic exegesis, optics, and logic as well as the rational sciences. In the field of geometry, he wrote a gloss (*ḥāshiya*) to Qāḏīzāde's commentary (*sharḥ*) on **Shams al-Dīn al-Samarqandī's** *Ashkāl al-ta'sīs*. Unfortunately this work is not extant.

In the field of astronomy, *al-Farā'id wa-'l-fawā'id fī tawḏīḥ sharḥ al-Mulakhkhaṣ* was Shirwānī's first important work on theoretical astronomy (*hay'a*), which was a gloss (*ḥāshiya*) on Qāḏīzāde's commentary (*sharḥ*) to **Mahmūd al-Jaghminī's** *al-Mulakhkhaṣ fī 'ilm al-hay'a al-basīṭa*. In order to explain the difficult parts, Shirwānī made use of other commentaries and class notes he took during Qāḏīzāde's lectures at the Samarqand *madrasa*; he completed the work after many rough drafts.

Shirwānī's most noteworthy work on theoretical astronomy is undoubtedly his commentary (*Sharḥ*) to Naṣīr al-Dīn al-Ṭūsī's *al-Tadhkira fī 'ilm al-hay'a*, which he completed on 11 January 1475. He emphasized that he wrote his commentary for advanced-level students to whom he lectured in the field of astronomy. His sources were other commentaries, the lecture notes of his teacher Qāḏīzāde, and his own insights.

The *Sharḥ* contains a great deal of information that often has little to do with Ṭūsī's *Tadhkira*. For example, Shirwānī provides comprehensive information about the Turkish calendar as well as other calendar systems. He also discusses Euclid's *Elements* based upon discussions he had with Qāḏīzāde, Ulugh Beg, and students at the Samarqand *madrasa*. Shirwānī also includes a registered copy of his license to teach (*ijāza*) that he obtained from Qāḏīzāde. He has a lengthy discussion on optics (*'ilm al-manāẓir*), which was considered an ancillary branch of astronomy. He cites numerous works and authors throughout, pointing out his own views when appropriate. Although a thorough analysis of Shirwānī's text has not been yet been made, his style indicates that he was aware of the attempts by **Ibn al-Haytham** and his follower Kamāl al-Dīn Fārisī to combine physical and geometrical approaches within optics, and that this was the subject of ongoing debates in the Samarqand school.

In his *Sharḥ*, Shirwānī discusses Ṭūsī's innovative cosmology in detail. He agrees with Ibn al-Haytham in combining mathematical and natural philosophical approaches; he disagrees with his Samarqand contemporary **'Alī Qūshjī**, who attempted to purge the science of astronomy of Aristotelian principles of physics and metaphysics. Further research into Shirwānī's work promises to provide important information on the history of late medieval Islamic astronomy.

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