Biographical Encyclopedia of Astronomers

Kūhī: Abū Sahl Wījan ibn Rustam [Wustam] al-Kūhī [al-Qūhī]

Flourished second half of the 10th century

Kūhī attained distinction as an astronomer skilled in observational instruments, and his work was well known among the astronomers and mathematicians of his age working in the Būyid domains of 'Iraq and western Iran. Born in Tabaristan, he was supported by three kings of the Būyid Dynasty: Adud al-Dawla, Ṣamṣām al-Dawla, and Sharaf al-Dawla, whose combined reigns covered the period 962–989. Thus, Kūhī probably did most of his work in the second half of the 10th century

Ibn al-Haytham and Bīrūnī knew of several of Kūhī's works, and later 'Umar al-Khayyām cites him as one of the "distinguished mathematicians of Iraq" (Sesiano, p. 281). In 969/970, Kūhī assisted Ṣūfī's observations in Shīrāz to determine the obliquity of the ecliptic, as well as in other observations of the Sun's movement, done on the order of Adud al-Dawla. And in 988/989, he was director of the observatory that 'Adud's son, Sharaf al-Dawla, built in Baghdad, which was intended to observe the Sun, Moon, and the five known planets

According to Bīrūnī, Kūhī constructed a house for solar observations whose lowest part was in the form of a segment of a sphere with a diameter of 25 cubits (approximately 13 m) and whose center was in the ceiling of the house. Sunlight was let in through an opening at that center point of the sphere, which was located in the roof.

Three of Kūhī's works deal directly with problems that might be called astronomical. They are: (1) *On What Is Seen of Sky and Sea* (published in Rashed), (2) *On Rising Times* (published in Berggren and Van Brummelen), and (3) *On the Distance from the Center of the Earth to the Shooting Stars* (published in Van Brummelen and Berggren). The first treats the visible horizon and shows how, knowing the height of a lighthouse on an island, one can calculate how far away its light can be seen (and related problems). In the second work, he demonstrates how to calculate the rising times and ortive amplitudes of the zodiacal signs using Menelaus's theorem. In the third, he employs parallax to calculate the distance to meteors. (Kūhī's technique was rediscovered in 1798 by Johann Benzenberg and Heinrich Brandes in Germany, who resolved the ancient question of whether meteors were atmospheric phenomena.) However, none of these works cites observational data or presents numerical examples. A fourth work, dealing with the astrolabe (published in Berggren), discusses the geometry of this instrument. Specifically, it addresses problems requiring the construction of specific lines or points of a planispheric astrolabe given other lines and points. A fifth work, employing a method for calculating the direction of Mecca, known as zījes, has been attributed to Kūhī. But the detailed calculations carried out are entirely out of character with his other works, and so the attribution must, for the present, be regarded as spurious.

Although Kūhī's work was studied by Islamic scholars as late as the 18th century (notably Muhammad ibn Sirṭāq in the first half of the 14th century and Mustafa Ṣidqī in the 18th

century), it—like that of many of his distinguished contemporaries and successors in the eastern regions—was unknown in the west.

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