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Ibn Bājja: Abū Bakr Muḥammad ibn Yaḥyā ibn al-Ṣāʾigh al-Tujībī al-Andalusī al-Saraqusṭī

Miquel Forcada

Alternate names

Avempace

Born **Saragossa, (Spain), last third of the 11th century**

Died **Fez, (Morocco), June or July 1139**

Ibn Bājja, one of the most important philosophers of Muslim Spain, was in the forefront of the 12th-century Andalusian movement to criticize and replace Ptolemaic astronomy based on Aristotelian principles. In addition to astronomy, he was also active in other scientific disciplines, such as mathematics, botany, pharmacology, and medicine. Ibn Bājja learned philosophy and other sciences in an environment that was deeply influenced by the court, ruled at that time by the Banū Hūd dynasty whose kings were patrons of science and scientists. Under their protection, Saragossa became an important center of both philosophical and mathematical studies. Ibn Bājja also mastered poetry and other disciplines that were based on the Arabic language and Islamic teachings. The Banū Hūd were ousted from Saragossa in 1110, but Ibn Bājja was employed by the city's new Almoravid governor, Ibn Tīfalwīt, whom he served for 3 years, though the exact dates are not known. The governor sent him as ambassador to ʿImād al-Dawla ibn Hūd, the former ruler of Saragossa who had established his court in Rueda de Jalón. The latter imprisoned him for several months. Ibn Bājja returned to Saragossa but soon left, perhaps because of the death of his protector Ibn Tīfalwīt (1117). The city would be occupied by the Christians in the following year. From that point on, his life became a long pilgrimage that took him to several cities in Muslim Spain and North Africa – Xàtiva, Almeria Granada, Oran, and perhaps Seville – though he never settled. According to some sources, Ibn Bājja held the post of minister to Yaḥyā ibn Yūsuf ibn Tāshifīn, governor of Fez, though some scholars disagree. Nonetheless, this episode, together with his period in the service of Ibn Tīfalwīt, is proof of his relationship with the Almoravid dynasty in spite of his scientific and philosophical career. The Almoravids based their legitimacy on religious observance and were therefore hostile to philosophy and other disciplines that could challenge their concept of orthodoxy. Ibn Bājja was imprisoned at least once by the Almoravids in Xàtiva for heterodoxy, but, apparently, the episode had no further consequences. It appears that he spent the last period of his life far from the court, occupied in his intellectual work and earning a living as a physician. However, the many challenges he had to confront during his life seem to have interfered with his intellectual work, as we find a large number of short, fragmentary, and incomplete treatises. The story of Ibn Bājja's death bears witness to the turbulence of the times, as he is said to have been poisoned by order of Abū al-ʿAlāʾ Zuhr, a member of the most important dynasty of court physicians in Muslim Spain, whether or not the story is true, other sources seem to attest to the enmity between the two scientists, an enmity that combined personal rivalry and religious considerations.

Ibn Bājja's work in natural philosophy has certain implications for the history of astronomy. In his commentaries on **Aristotle**'s *Physics* he accepted – diverging from Aristotle, and supporting **John Philoponus** – the possibility of

motion in the void or in a medium that does not exert resistance, as happens in the celestial bodies, thus applying the physical principles of the sublunary world to the heavens. These ideas were echoed by European Scholastics, and from there may have influenced **Galileo Galilei**. However, this conception of dynamics cannot be traced, for the moment, in Ibn Bājja's astronomical thought.

The importance of Ibn Bājja's astronomy lies in the fact that he seems to have been the first of the Andalusians to develop a criticism of **Ptolemy** based on philosophical tenets (the others being **Ibn Ṭufayl**, **Ibn Rushd**, and **Biṭrūjī**). They wished to formulate a cosmos according to Aristotelian principles (uniform and circular motions centered on the Earth) in which planetary models had no need of eccentrics and epicycles. According to **Maimonides** in *The Guide of the Perplexed*, Ibn Bājja accepted eccentrics but not epicycles. However, a deeper study of his extant works has revealed two important, and hitherto unremarked, facts: On the one hand, Ibn Bājja must have had a profound knowledge of mathematical astronomy (consistent with the fact that he was a mathematician), and the information found in a range of sources, including his own letters, reveal that he observed an occultation of Jupiter by Mars, observed solar transits of Venus and Mercury (seemingly a confusion with sunspots), and predicted a lunar eclipse. On the other hand, Ibn Bājja must originally have been a follower of Ptolemy. In a letter addressed to Abū Jaʿfar Yūsuf ibn Ḥasdāy, he attacks **Ibn al-Haytham**, one of the most important mathematical astronomers who criticized Ptolemy, arguing that Ibn al-Haytham did not understand Ptolemy's models for Mercury and Venus, something that is fairly clear in the case of Mercury. Again on the subject of Mercury, he disagrees with the Andalusian astronomer **Zarqālī**, who formulated some alternative models to Ptolemy. Besides, in his commentary to Aristotle's *Physics*, Ibn Bājja introduces a digression following Philoponus in which he accepts the existence of epicycles. However, a short and incomplete treatise has survived entitled *Kalām fī al-hay'a* (Discourse on cosmology) that criticizes Ptolemy's method. Here, on the basis of Aristotelian logic, Ibn Bājja tackles the problem of the relationship between what the astronomer can observe and the underlying reality and argues that the planetary models of the Ptolemaic astronomers do not fit the tenets of Aristotelian scientific method.

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