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Samaw'al: Abū Naṣr Samaw'al ibn Yaḥyā ibn 'Abbās al-Maghribī al-Andalusī

Negar Naderi

Flourished (Iraq), 12th century

Died Marāgha, (Iran), 1174/1175

Samaw'al was an eminent mathematician, physician, and astronomer, who composed some 85 treatises, all in Arabic. He was from a cultivated Jewish family that was originally from the Maghrib or, according to some sources, from al-Andalus. His father migrated to Baghdad and settled there. The young Samaw'al studied Hebrew, mathematics, and medicine. He traveled in the Muslim east, eventually settling in Marāgha in northwestern Iran, which was then a major city. He spent the rest of his life there as a physician in service of Jahān Pahlawān (died: 1186) of a semi-independent minor dynasty, the Atābakān. There he converted to Islam and wrote a book against Judaism, which became very controversial.

His main astronomical work is *Kashf'awār al-munajjimīn wa-ghalaṭihim fī akthar al-a'māl wa-'l-aḥkām* (Exposure of the deficiencies of the astronomers and their errors in most of [their] operations and judgments), written in 1165/1166. This treatise is divided into 25 (chapters) *bābs*, each consisting of several (sections) *faṣls*, in which he indicates the errors that he has found in the astronomical works of Greek scientists, such as Euclid, **Archimedes**, and **Apollonius**, of Islamic scientists such as **Ibrāhīm ibn Sinān**, **Abū Ja'far al-Khāzin**, **Bīrūnī**, **Abū Ma'shar**, **Ḥabash**, **Ṣūfī**, and **Ibn al-Haytham**, and of Indian scientists such as **Brahmagupta**. The titles of the chapters are as follows:

- (1) The reason for composing this book;
- (2) On finding altitudes by astrolabe;
- (3) On finding altitudes by shadow;
- (4) On sines;

- (5) On observations;
- (6) On calendars;
- (7) On interpolation;
- (8) On finding hour-angles from equal hours;
- (9) On equation of time;
- (10) On daily hours;
- (11) On ascensions;
- (12) On projection of rays;
- (13) On latitudes of planets;
- (14) On aphesis;
- (15) On true horizons;
- (16) On finding heights of mountains and other high objects;
- (17) On positions of fixed stars;
- (18) On the nature of planets;
- (19) On animodars;
- (20) On elections (of proper times);
- (21) On oblique ascensions;
- (22) On the times of conjunctions, syzygies, and transfers;
- (23) On properties of inscribed polygons and their effects on the sublunar world;
- (24) On syzygies of epicycles; and

(25) Types of indications.

In the last chapters (20-25), Samaw'al uses a type of philosophical argument based upon his previous chapters to explain his view regarding the effects of stars on terrestrial events. He concludes that because the stars are innumerable and the relations and effects among them are virtually incalculable, an astrologer would need to take into consideration 6,817 variables for each person, therefore making it impossible to predict the future in any meaningful way.

Samaw'al was perhaps best known for his work in mathematics, especially algebra and arithmetic. He also wrote on medicine.

Selected References

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