

Biographical Encyclopedia of Astronomers

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Samaw'al: Abū Nasr Samaw'al ibn Yahya ibn 'Abbās al-Maghribi al-Andalusī

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 came from a cultivated Jewish family 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 Maragha in northwestern Iran, which was then a major city. He spent the rest of his life there as a physician in the service of Jahan Pahlawan (died 1186) of a semi-independent minor dynasty, the Atabakan. There he converted to Islam and wrote a book against Judaism, which became very controversial

His main astronomical work is *Kashfawār al-munajjimin wa-ghalatihim fi akthar al-a'mal wa-l-ahkām* (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 Sinan, Abū Jafar al-Khāzin, Bīrūnī, Abū Mashar, Habash, Şūfi, 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 the 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.

Negar Naderi

Selected References

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