



ABŪ JA'FAR KĀZEN

ABŪ JA'FAR MOḤAMMAD B. AL-ḤASAN AL-KĀZEN AL-KORĀSĀNĪ, astronomer (ca. 287/900-probably 360/970). According to Ebn al-Nadīm (*Fehrest*, pp. 138, 250) and Ebn al-Qeftī (*Ta'riḵ al-ḥokamā'*, ed. J. Lippert, Leipzig, 1903, p. 40), a commentary on the beginning of Aristotle's *De caelo* was dedicated to him by Kendī's pupil, **Abū Zayd Balkī** (d. 322/934). And according to Abū Naṣr Maṣū' b. 'Erāq (*Rasā'el*, Hyderabad [Deccan], 1947, p. 45), he had correspondence with Ebrāhīm b. Senān (d. 946).

A native of Khorasan (*Fehrest*, p. 266), Kāzen was one of the many eminent scientists who flocked to the various courts of the Buyid dynasts. On 13 Rabī' II 348/24 June 959 and 10 Šawwāl 348/15 December 959 he was present at observations of the summer and winter solstices made by Abu'l-Faẓl Aḥmad Heravī (Bīrūnī, *Taḥdīd al-amāken*, ed. P. Bulgakov, Cairo, 1964, pp. 98-99; tr. J. Ali, Beirut, 1967, pp. 67-68; comm. E. S. Kennedy, Beirut, 1973, p. 41). He himself seems to have made an observation of the solar declination at the request of Abu'l-Faẓl Moḥammad b. al-'Amīd (q.v.), Rokn-al-dawla's vizier. This took place at Kāšān on 10 Ša'bān 349/6 October 960 (*ibid.*, ed., pp. 119-20; tr., p. 86; comm., pp. 54-55). Kāzen reported the observation in his *Ziḵ al-ṣafā'eḥ*, which was composed for the vizier.

Kāzen's writings, as presently known, are as follows. Ebn al-Nadīm (*Fehrest*, p. 282) and Ebn al-Qeftī (*Ḥokamā'*, p. 396) list only nos. 1 and 9, although the former does refer to his commentary on Euclid's *Elements* (*Fehrest*, p. 266). 1. *Ziḵ al-ṣafā'eḥ* ("Astronomical tables of the timpan"), lost (see E. S. Kennedy, *A Survey of Islamic Astronomical Tables*, Philadelphia, 1956, p. 137, no. X200). It



is cited frequently by Bīrūnī. For example, its concentric model for solar motion is discussed in *Āṭār al-bāqīa* (p. 259; *Chronology*, p. 249); *Taḥdīd* (ed. pp. 57-58; tr., p. 28; comm., p. 12); *Transits* (ed. as item 3 in his *Rasā'el*, Hyderabad [Deccan], 1949, pp. 77-78; tr. E. S. Kennedy, Beirut, 1959, pp. 85-86; note that Abū Ja'far's criticism of Abū Ma'šar's solar theory occurs in ed., p. 77, tr., p. 85); and *al-Qānūn al-Mas'ūdī* (Hyderabad [Deccan], 1954-56, pp. 630-32). For this theory, see Samsó, "Solar Model." The theory of trepidation in the *Zīj* also is mentioned by Bīrūnī (*Āṭār al-bāqīa*, p. 326; *Chronology*, p. 322). Abū Naṣr (see above) wrote for Bīrūnī a *Resāla fī taṣḥīḥ mā waqa'a le-Abī Ja'far al-Kāzen men al-sahw fī Zīj al-ṣafā'eḥ* ("Epistle on correcting what happened to Abū Ja'far because of negligence in the *Zīj al-ṣafā'eḥ*"). This text is published as treatise 3 in Abū Naṣr's *Rasā'el* (see also Bīrūnī, *Resāla fī fehrest kotob Moḥammad b. Zakarīyā' al-Rāzī*, ed. P. Kraus, Paris, 1936, p. 44). For other references to the *Zīj*, see Samsó, "Solar Model," and Sezgin, *GAS* V, pp. 298-99; VI, pp. 189-90. 2. *Ketāb tafsīr ṣadr al-maqālāt al-'āšera men ketāb Oqlīdes* ("Commentary on the beginning of the tenth book of the Book of Euclid"), preserved in many manuscripts (see list in Sezgin, op. cit.). 3. *Ketāb al-tafsīr le'l-Maḥeṣṣī* ("Commentary on the Almagest"), lost. Bīrūnī quotes it as reporting observations of the solstices made by the Banū Mūsā (*Taḥdīd*, ed., p. 95; tr., p. 64; comm., p. 40) and as recording the lengths of the seasons determined by Kāled Marvarrūdī, 'Alī b. 'Īsā Ḥarrānī, and Sanad b. 'Alī (*Qānūn*, p. 653). Naṣīr-al-dīn Ṭūsī also quotes it (*Ketāb al-ṣakl al-qeṭā'*: A. Carathéodory, *Traité du quadrilatère*, Constantinople, 1981, ed., p. 123; tr., p. 259). 4. *Ketāb al-borhān 'alā al-ṣakl al-sābe' men ketāb Banī Mūsā* ("Book of the proof of the seventh figure from the Book of the Banū Mūsā"); for a manuscript, see Sezgin, *GAS* V, p. 299. The work is on Heron's theorem on the area of a triangle; Abū Ja'far's proof is repeated by Ṭūsī (*Rasā'el*, Hyderabad [Deccan], 1939-40, II/1, pp. 26-27). 5. *Ketāb al-madḳal al-kabīr elā 'elm al-nojūm* ("Book of the great introduction to the science of the stars"), lost. Bīrūnī cites it for its methods of determining the weekday on which the month of Moḥarram will begin in any given year (*Āṭār al-bāqīa*, pp. 202-03; *Chronology*, pp. 183-84). Perhaps a similar passage in his *Qānūn* (p. 1232) is from the same source. 6. *Ketāb fī'l-ab'ād wa'l-aḥrām* ("Book on the distances and sizes [of the stars]"), lost; Bīrūnī cites it (*Qānūn*, p. 1312). 7. *Ketāb al-oṣūl al-handasīya* ("Book of the elements of geometry"), lost; Abū Naṣr cites it as containing criticisms of Menelaus (*Rasā'el*, p. 3). 8. *Ketāb fī mayl al-aḥzā'* ("Book on the declination of the degrees [of the ecliptic]"), lost but quoted by Ṭūsī (*Ṣakl*, ed., pp. 115-16; tr., pp. 149-51). 9. *Ketāb al-masā'el al-'adadīya* ("Book of questions concerning numbers"), lost.



Abū Ja‘far’s use of conic sections is mentioned by ‘Omar Ḳayyāmī (*Resāla fī barāhīn al-ĵabr wa’l-moqābala*: F. Woepcke, *L’Algebre d’Omar Alkhayyāmī*, Paris, 1851, ed., p. 2, tr., p. 3). Ebn Ḳaldūn quotes his view concerning the latitudinal limits of the seven climata (*The Muqaddimah*, tr. F. Rosenthal, London, 1958, I, p. 115).

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See also Y. Dold-Samplonius in *Dictionary of Scientific Biography* VII, New York, 1973, pp. 334-35.

A. Sayili, *The Observatory in Islam*, Ankara, 1960, pp. 103-04.

J. Samsó, “A Homocentric Solar Model by Abū Ja‘far al-Khāzin,” *JHAS* 1, 1977, pp. 268-75.

Idem, “al-Khāzin,” *EIF* IV, pp. 1182-83.