

periodic course of the magnetic needle, and in the distribution of organisms over the earth's surface.

The Arabs were in possession of planetary tables\* as early as the close of the eighth century. We have already observed that the *Susruta*, the ancient incorporation of all the medical knowledge of the Indians, was translated by learned men belonging to the court of the Calif Haroun Al-Raschid—a proof of the early introduction of Sanscrit literature. The Arabian mathematician Albiruni even went to India for the purpose of studying astronomy. His writings, which have only recently been made accessible to us, prove how intimately he had made himself acquainted with the country, traditions, and comprehensive knowledge of the Indians.†

However much the Arabian astronomers may have owed to the earlier civilized nations, and especially to the Indian and Alexandrian schools, they have, nevertheless, considerably extended the domain of astronomy by their own practical endowments of mind; by the number and direction of their observations; the improvement of their instruments for angular measurement; and their zealous efforts to rectify the older tables by a comparison with the heavens. In the seventh book of the *Almagest* of Abul-Wefa, Sédillot found a notice of the important inequality in the moon's longitude, which disappears at the syzygies and quadratures, attains its maximum at the octants, and has long been regarded, under the name of *variation*, as the discovery of Tycho Brahe.‡ The observations of

\* On the Indian tables which Alphazari and Alkoresmi translated into Arabic, see Chasles, *Recherches sur l'Astronomie Indienne*, in the *Comptes Rendus des Séances de l'Acad. des Sciences*, t. xxiii., 1846, p. 846–850. The substitution of the sine for the arc, which is usually ascribed to Albategnius, in the beginning of the tenth century, also belongs originally to the Indians; tables of sines are to be found in the *Surya-Siddhanta*.

† Reinaud, *Fragments Arabes relatifs à l'Inde*, p. xii.–xvii., 96–126, and especially 135–160. Albiruni's proper name was Abul-Ryhan. He was a native of Byrun, in the Valley of the Indus, and a friend of Avicenna, with whom he lived at the Arabian academy which had been formed in Charezm. His stay in India, and the composition of his history of that country (*Tarîkhi-Hind*), of which Reinaud has made known the most remarkable fragments, belong to the years 1030–1032.

‡ Sédillot, *Matériaux pour servir à l'Histoire comparée des Sciences Mathématiques chez les Grecs et les Orientaux*, t. i., p. 50–89; also in the *Comptes Rendus de l'Acad. des Sciences*, t. ii., 1836, p. 202; t. xvii., 1843, p. 163–173; t. xx., 1845, p. 1308. In opposition to this opinion, Biot maintains that the fine discovery of Tycho Brahe by no means belongs to Abul-Wefa, and that the latter was acquainted, not with the "variation," but only with the second part of the "evection." (*Journal*