

Ebn-Junis in Cairo have become extremely important with reference to the perturbations and secular changes of the orbits of the two largest planets, Jupiter and Saturn.* The measurement of a degree, which the Calif Al-Mamun caused to be made in the great plain of Sindschar, between Tadmor and Rakka, by observers whose names have been transmitted to us by Ebn-Junis, has proved less important in its results than by the evidence which it affords of the scientific culture of the Arabian race.

We must regard among the results yielded by the reflection of this culture, in the West, the astronomical congress held at Toledo, in Christian Spain, under Alfonso of Castile, in which the Rabbin Isaac Ebn Sid Hazan played an important part; and in the far East, the observatory founded by Ilschan Holagu, the grandson of the great conqueror Genghis Khan, on a hill near Meraghar, and supplied with many instruments. It was here that Nassir Eddin, of Tus, in Khorassan, made his observations. These individual facts deserve to be noticed in a history of the contemplation of the universe, since they tend vividly to remind us of how much the Arabs have effected in diffusing knowledge over vast tracts of territory, and in accumulating those numerical data which contributed, in a great degree, during the important period of Kepler and Tycho, to lay the foundation of theoretical astronomy, and of correct views of the movements of the heavenly bodies. The spark kindled in those parts of Asia which were peopled by Tartars spread, in the fifteenth century, westward to Samarcand, where Ulugh Beig, of the race of Timour, established, besides an observatory, a gymnasium after the manner of the Alexandrian Museum, and caused a catalogue of stars to be drawn up, which was based on wholly new and independent observations.†

Besides making laudatory mention of that which we owe to the natural science of the Arabs in both the terrestrial and celestial spheres, we must likewise allude to their contributions in separate paths of intellectual development to the gen-

des Savans, 1843, p. 513-532, 609-626, 719-737; 1845, p. 146-166; and *Comptes Rendus*, t. xx., 1845, p. 1319-1323.)

* Laplace, *Expos. du Système du Monde*, note 5, p. 407.

† On the observatory of Meragha, see Delambre, *Histoire de l'Astronomie du Moyen Age*, p. 198-203; and Am. Sédillot, *Mém. sur les Instrumens Arabes*, 1841, p. 201-205, where the gnomon is described with a circular opening. On the peculiarities of the star catalogue of Ulugh Beig, see J. J. Sédillot, *Traité des Instrumens Astronomiques des Arabes*, 1834, p. 4