

and not visible in $39^{\circ} 52'$ lat. (?) It contains only 1019 positions of stars, which are reduced to the year 1437. A subsequent commentary gives 300 other stars, observed by Abu-Bekri Altizini in 1533. Thus we pass from Arabs, Persians, and Moguls, to the great epoch of Copernicus, and nearly to that of Tycho Brahe.

The extension of navigation in the tropical seas, and in high southern latitudes, has, since the beginning of the sixteenth century, exerted a powerful influence on the gradual extension of our knowledge of the firmament, though in a less degree than that effected a century later by the application of the telescope. Both were the means of revealing new and unknown regions of space. I have already, in other works, considered* the reports circulated first by Americus Vesputius, then by Magellan, and Pigafetta (the companion of Magellan and Elcano), concerning the splendor of the southern sky, and the descriptions given by Vicente Yañez Pinzon and Acosta of the black patches (coal-sacks), and by Anghiera and Andrea Corsali of the Magellanic clouds. A merely sensuous contemplation of the aspect of the heavens here also preceded measuring astronomy. The richness of the firmament near the southern pole, which, as is well known, is, on the contrary, peculiarly deficient in stars, was so much exaggerated that the intelligent Polyhistor Cardanus indicated in this region 10,000 bright stars which were said to have been seen by Vesputius with the naked eye.†

Friedrich Houtman and Petrus Theodori of Embden (who, according to Olbers, is the same person as Dircksz Keyser) now first appeared as zealous observers. They measured distances of stars at Java and Sumatra; and at this period the most southern stars were first marked upon the celestial maps of Bartsch, Hondius, and Bayer, and by Kepler's industry were inserted in Tycho Brahe's Rudolphine tables.

Scarcely half a century had elapsed from the time of Magellan's circumnavigation of the globe before Tycho commenced his admirable observations on the positions of the fixed stars, which far exceeded in exactness all that had hitherto been done in practical astronomy, not excepting even about $19'$ in determining the latitude of Bokhara. (Humboldt, *Asie Centrale*, t. iii., p. 592, and Sédillot, in the *Prolégomènes d'Oloug-Beg*, p. cxxiii.-cxxv.)

* *Cosmos*, vol. ii., p. 285-290; Humboldt, *Examen Crit. de l'Histoire de la Géogr.*, t. iv., p. 321-336; t. v., p. 226-238.

† *Cardani Paralipomenon*, lib. viii., cap. 10. (*Opp.*, t. ix., ed. Lugd. 1663, p. 508.)