

Sect. 5.—Measures of the Earth.

THERE were, as we have said, few attempts made, at the period of which we are speaking, to improve the accuracy of any of the determinations of the early Alexandrian astronomers. One question naturally excited much attention at all times, the *magnitude* of the earth, its figure being universally acknowledged to be a globe. The Chaldeans, at an earlier period, had asserted that a man, walking without stopping, might go round the circuit of the earth in a year; but this might be a mere fancy, or a mere guess. The attempt of Eratosthenes to decide this question went upon principles entirely correct. Syene was situated on the tropic; for there, on the day of the solstice, at noon, objects cast no shadow; and a well was enlightened to the bottom by the sun's rays. At Alexandria, on the same day, the sun was, at noon, distant from the zenith by a fiftieth part of the circumference. These two cities were north and south from each other: and the distance had been determined, by the royal overseers of the roads, to be 5000 stadia. This gave a circumference of 250,000 stadia to the earth, and a radius of about 40,000. Aristotle²⁹ says that the mathematicians make the circumference 400,000 stadia. Hipparchus conceived that the measure of Eratosthenes ought to be increased by about one-tenth.³⁰ Posidonius, the friend of Cicero, made another attempt of the same kind. At Rhodes, the star Canopus but just appeared above the horizon; at Alexandria, the same star rose to an altitude of $\frac{1}{48}$ th of the circumference; the direct distance on the meridian was 5000 stadia, which gave 240,000 for the whole circuit. We cannot look upon these measures as very precise; the stadium employed is not certainly known; and no peculiar care appears to have been bestowed on the measure of the direct distance.

When the Arabians, in the ninth century, came to be the principal cultivators of astronomy, they repeated this observation in a manner more suited to its real importance and capacity of exactness. Under the Caliph Almamon,³¹ the vast plain of Singiar, in Mesopotamia, was the scene of this undertaking. The Arabian astronomers there divided themselves into two bands, one under the direction of Chalid ben Abdolmalic, and the other having at its head Alis ben Isa. These two parties proceeded, the one north, the other south, determining the distance by the actual application of their measuring-rods to the ground,

²⁹ *De Cælo*, ii. ad fin.

³⁰ Plin. ii. (cviii.)

³¹ Montu. 357.