

star can ever be seen at the same time with the sun. If the whole circuit of the sky be divided into twelve parts or *signs*, it is estimated by Autolycus, the oldest writer on these subjects whose works remain to us,<sup>38</sup> that the stars which occupy one of these parts are absorbed by the solar rays, so that they cannot be seen. Hence the stars which are seen nearest to the place of the setting and the rising sun in the evening and in the morning, are distant from him by the half of a sign: the evening stars being to the west, and the morning stars to the east of him. If the observer had previously obtained a knowledge of the places of all the principal stars, he might in this way determine the position of the sun each night, and thus trace his path in a year.

In this, or some such way, the sun's path was determined by the early astronomers of Egypt. Thales, who is mentioned as the father of Greek astronomy, probably learnt among the Egyptians the results of such speculations, and introduced them into his own country. His knowledge, indeed, must have been a great deal more advanced than that which we are now describing, if it be true, as is asserted, that he predicted an eclipse. But his having done so is not very consistent with what we are told of the steps which his successors had still to make.

The Circle of the Signs, in which the sun moves among the stars, is obliquely situated with regard to the circles in which the stars move about the poles. Pliny<sup>39</sup> states that Anaximander,<sup>40</sup> a scholar of Thales, was the first person who pointed out this obliquity, and thus, as he says, "opened the gate of nature." Certainly, the person who first had a clear view of the nature of the sun's path in the celestial sphere, made that step which led to all the rest; but it is difficult to conceive that the Egyptians and Chaldeans had not already advanced so far.

The diurnal motion of the celestial sphere, and the motion of the moon in the circle of the signs, gave rise to a mathematical science, *the Doctrine of the Sphere*, which was one of the earliest branches of applied mathematics. A number of technical conceptions and terms were soon introduced. The *Sphere* of the heavens was conceived to be complete, though we see but a part of it; it was supposed to turn about the visible *pole* and another pole opposite to this, and these poles were connected by an imaginary *Axis*. The circle which divided the sphere exactly midway between these poles was called the *Equator* (*ισημέριος*).

<sup>38</sup> Delamb. *A. A.* p. xiii.

<sup>39</sup> Lib. ii. c. (viii.)

<sup>40</sup> Plutarch, *De Plac. Phil.* lib. ii. cap. xii. says Pythagoras was the author of this discovery.