

On considering the different stages of the development of cosmical contemplation, we are able to trace from the earliest ages faint indications and presentiments of the attraction of masses and of centrifugal forces. Jacobi, in his researches on the mathematical knowledge of the Greeks (unfortunately still in manuscript), justly comments on "the profound consideration of nature evinced by Anaxagoras, in whom we read with astonishment a passage asserting that the moon, if its centrifugal force ceased, would fall to the earth like a stone from a sling."*

I have already, when speaking of aërolites, noticed similar expressions of the Clazomenian and of Diogenes of Apollonia on the "cessation of the rotatory force."† Plato truly had a clearer idea than Aristotle of the *attractive force* exercised by the earth's center on all heavy masses removed from it, for the Stagirite was indeed acquainted, like Hipparchus, with the acceleration of falling bodies, although he did not correctly understand the cause. In Plato, and according to Democritus, *attraction* is limited to bodies having an affinity for one an-

universorum, ut in unitatem integritatemque suam sese conferant in formam globi coëuntes. Quam affectionem credibile est etiam Soli, Lunæ, cæterisque errantium fulgoribus inesse, ut ejus efficacia in ea qua se repræsentant rotunditate permaneant, quæ nihilominus multis modis suis efficiunt circuitus. Si igitur et terra faciat alios, utpote secundum centrum (mundi), necesse erit eos esse qui similiter extrinsecus in multis apparent, in quibus invenimus annum circuitum. Ipse denique Sol medium mundi putabitur possidere, quæ omnia ratio ordinis, quo illa sibi invicem succedunt, et mundi totius harmonia nos docet, si modo rem ipsam ambobus (ut aiunt) oculis inspiciamus." (Copern., *De Revol. Orb. Cæl.*, lib. i., cap. 9, p. 7, b.)

* Plut., *De Facie in Orbe Lunæ*, p. 923. (Compare Ideler, *Meteorologia veterum Græcorum et Romanorum*, 1832, p. 6.) In the passage of Plutarch, Anaxagoras is not named; but that the latter applied the same theory of "falling where the force of rotation had been intermitted" to all (the material) celestial bodies, is shown in Diog. Laert., ii. 12, and by the many passages which I have collected (p. 122). Compare, also, Aristot., *De Cælo*, ii., 1, p. 284, a. 24, Bekker, and a remarkable passage of Simplicius, p. 491, b., in the *Scholias*, according to the edition of the Berlin Academy, where the "non-falling of heavenly bodies" is noticed "when the rotatory force predominates over the actual falling force or downward attraction." With these ideas, which also partially belong to Empedocles and Democritus, as well as to Anaxagoras, may be connected the instance adduced by Simplicius (l. c.), "that water in a vial is not spilled when the movement of rotation is more rapid than the downward movement of the water," τῆς ἐπὶ τὸ κάτω τοῦ ὕδατος φαρῶς.

† See *Cosmos*, vol. i., p. 134. (Compare Letronne, *Des Opinions Cosmographiques des Pères de l'Église*, in the *Revue des Deux Mondes*, 1834, *Cosmos*, t. i., p. 621.)