

down.”* We find nothing of this view of the structure of the universe, this assumption of *dark* cosmical bodies which fall upon our earth, in the doctrines of the old Ionic schools, from Thales and Hippocrates to Empedocles.† The impression made by the occurrence of nature in the 78th Olympiad appears to have powerfully called forth the idea of the fall of dark masses. In the more recent Pseudo-Plutarch (Plac., ii., 13), we read merely that the Milesian Thales considered “all stars to be *earthy* and *fiery* bodies (γεώδη καὶ ἔμπυρα).” The endeavors of the *earlier* Ionic physiology were directed to the discovery of the primitive cause of all things, formation by mixture, gradational change and transition of one kind of matter into another: to the processes of *genetic development* by solidification or dilution. The *revolution* of the sphere of the heavens, “which holds the Earth firmly in the center,” was already conceived by Empedocles as an actively moving cosmical force. Since, in these first attempts at physical theories, the ether, the *fire-air* (and, indeed, fire itself), represents the expansive force of heat, so the idea of the propelling revolution rending fragments from the Earth became connected with the lofty *region of the ether*. Therefore Aristotle calls (*Meteorol.*, i., 339, Bekker) the ether “the eternally moving body,”‡ as it were the immediate substratum of motion, and seeks for etymological reasons for this assertion. On this account, we find in the biography of Lysander “that the relaxation of the centrifugal force causes the *fall* of celestial bodies;” as also in another place, where Plutarch, evidently alluding again to opinions of Anaxagoras, or Diogenes of Apollonia (*De Facie in Orbe Lunæ*, p. 9–23), puts forward the assertion “that the Moon would fall to the Earth like a stone in a sling if its centrifugal force

* This remarkable passage (Plut., *Lys.*, cap. xii.), literally translated, runs thus: “But there is another and more probable opinion, which holds that falling stars are not emanations or detached parts of the elementary fire, that go out the moment they are kindled, nor yet a quantity of air bursting out from some compression, and taking fire in the upper regions; but that they are really heavenly bodies, which, from some relaxation of the rapidity of their motion, or by some irregular concussion, are loosened and fall, not so much upon the habitable part of the globe as into the ocean, which is the reason that their substance is seldom seen.”

† With regard to absolutely *dark* cosmical bodies, or such in which the *light-process* ceases (*periodically?*); as to the opinions of moderns (Laplace and Bessel); and Bessel's observation, confirmed by Peters in Königsberg, of a variability of the *proper motion* of Procyon, see *Cosmos*, vol. iii., p. 164–166.

‡ Compare *Cosmos*, vol. iii., p. 31–33.