

—a movement of the medium between the eye and the object seen—and not by emissions from the object or the eye. Hearing is compared with sight, as sound is likewise a consequence of the vibration of the air.

Aristotle, while he teaches men to investigate generalities in the particulars of perceptible unities by the force of reflective reason, always includes the whole of nature, and the internal connection not only of forces, but also of organic forms. In his book on the parts (organs) of animals, he clearly intimates his belief that throughout all animate beings there is a scale of gradation, in which they ascend from lower to higher forms. Nature advances in an uninterrupted progressive course of development, from the inanimate or “elementary” to plants and animals; and, “lastly, to that which, though not actually an animal, is yet so nearly allied to one, that on the whole there is little difference between them.”* In the transition of formations, “the gradations are almost imperceptible.”† The unity of nature was to the Stagirite the great problem of the Cosmos. “In this unity,” he observes, with singular animation of expression, “there is nothing unconnected or out of place, as in a bad tragedy.”‡

The endeavor to reduce all the phenomena of the universe to one principle of explanation is manifest throughout the physical works of this profound philosopher and accurate observer of nature; but the imperfect condition of science, and ignorance of the mode of conducting experiments, *i. e.*, of calling forth phenomena under definite conditions, prevented the comprehension of the causal connection of even small groups of physical processes. All things were reduced to the ever-recurring contrasts of heat and cold, moisture and dryness, primary density and rarefaction—even to an evolution of alterations in the organic world by a species of inner division (antiperistasis), which reminds us of the modern hypothesis of opposite polarities and the contrasts presented by + and —.§

* Aristot., *De partibus Anim.*, lib. iv., cap. 5, p. 681, lin. 12, Bekker.

† Aristot., *Hist. Anim.*, lib. ix., cap. 1, p. 588, lin. 10–24, Bekker. When any of the representatives of the four elements in the animal kingdom on our globe fail, as, for instance, those which represent the element of the purest fire, the intermediate stages may perhaps be found to occur in the moon. (Biese, *Die Phil. des Aristoteles*, bd. ii., s. 186.) It is singular enough that the Stagirite should seek in another planet those intermediate links of the chain of organized beings which we find in the extinct animal and vegetable forms of an earlier world.

‡ Aristot., *Metaph.*, lib. xiii., cap. 3, p. 1090, lin. 20, Bekker.

§ The *ἀντιπερίττασις* of Aristotle plays an important part in all his