

cruises in a part of the ocean which, after him, was penetrated by no navigator for four centuries.¹

The high tides in the estuaries of Britain are said to have made a profound impression upon Pytheas, and to have first suggested to him a theory of the tides. However this may be, Pytheas undoubtedly gave the Greeks a true notion of the tides in attributing them, two thousand years before Newton, to the influence of the moon.²

To Aristotle,³ who was a contemporary of Pytheas, we are indebted for many ARISTOTLE. important additions to oceanography; an elevated intelligence, like that of the Stagyrite, must necessarily have been attracted to the study of the ocean, in the capacity both of naturalist and of thinker. That the sea was the object of his meditations and researches, is indicated by a legend as to the manner of his death; it is reported that, despairing of ever being able to find the interpretation of the movements of the waters of the Strait of Euripus, he threw himself into the whirlpool. The speculative philosopher often appears beneath his observations, and his works abound in judicious views concerning the phenomena of the sea, bearing at once the stamp of remarkable sagacity and of an earnest and investigating mind. His doctrines relating to the ocean had so much influence that his ideas upon the subject were reproduced among the Romans and down to the close of the Middle Ages.

Aristotle's observations are scattered through his works on Natural History and Physics, and the second book of his Meteorology commences with what may be called a treatise on oceanography. He there deals, in particular, with the relations of land and sea. He regards the earth as a sphere, placed in the centre of the universe, round which other celestial bodies revolve. He establishes its spherical form by the fact that all things gravitate towards the centre, and by reference to the shadow of the earth during eclipses.⁴ He regards the habitable world as being confined to the temperate zone; all beyond the tropic to the south is uninhabitable from heat, while the land below the Great Bear is uninhabitable from cold. He adds that there must be in the southern hemisphere a temperate zone corresponding to the northern one, but does not say that it is inhabited. He ridicules the idea that the inhabited world is circular—a notion which appears to have been prevalent in his day as well as in the time of Herodotus.

Humboldt believes that the following passage must have had much influence in leading up to the discoveries of Columbus:—"It appears," says Aristotle, "those are not

¹ St. Martin, *op. cit.*, pp. 101–109; Bunbury, Ency. Brit., art. "Pytheas."

² Plutarch, *Plac. Phil.*, iii. 17. Timæus, who died about 265 B.C., and who contributed much to the extension of geographical knowledge of the western parts of Europe, was far from giving such an interpretation. He stated that the flux and reflux of the ocean were due to the rising of the great rivers which discharged themselves from the mountains of Gaul. Their risings caused the water of the sea to retire, and when the rivers were no more swollen the reflux occurred (Timæus, *Frag.*, 36; Plutarch, *Plac. Phil.*).

³ 384 to 322 B.C.

⁴ In these cosmic views Aristotle followed those of the astronomer, Eudoxus of Cnidus, who lived a generation before him.

HIS GENERAL
VIEWS ON
COSMOGRAPHY.