

tains, for these have but a slight elevation when compared with the volume of the earth.¹ In one of Seneca's tragedies there is the most remarkable prophecy on record, pointing to the discovery of America, more remarkable than the suggestion of Strabo noted above. An immense land, new worlds, shall in later years, he says, be disclosed in the Ocean.²

Pliny the Elder³ held, as was generally admitted in his time, that the sea sur- PLINY THE ELDER.
rounded the world like a girdle, which, he says, is a fact demonstrated by experience, and concerning which it is no longer necessary to indulge in speculations.⁴ The whole part of the work in which he deals with the ocean is full of errors and conjectures. He catalogues marine animals into one hundred and seventy-six species,⁵ being four less than the number recorded by Aristotle in the Ægean Sea alone. Pleased with his enumeration, he exclaims:—"Surely, then, every one must allow that it is quite impos- HIS VIEWS CON-
CERNING MARINE
ORGANISMS.
sible to comprise every species of [land] animal in one general view for the information of mankind. And yet, by Hercules! in the sea and in the ocean, vast as it is, there exists nothing that is unknown to us, and, a truly marvellous fact, it is with those things which Nature has concealed in the deep that we are best acquainted!"⁶

Pliny confessed himself unable to give a detailed account of the depth of the ocean. Some parts he stated to be 15 stadia (1500 fathoms) deep, others "immensely deep, no bottom having been found." In explaining very clearly "why the sea is salt," he says:—"Hence it is that the widely-diffused sea is impregnated with the flavour of salt, in consequence of what is sweet and mild being evaporated from it, which the force of fire easily accomplishes; while all the more acrid and thick matter is left behind, on which account the water of the sea is less salt at some depth than at the surface." In this explanation Pliny followed Aristotle.

To about the time of Pliny must be referred the Periplus of the Erythræan Sea—an PERIPLUS OF THE
ERYTHRÆAN SEA.
important work, evidently compiled for the use of those engaged in the commerce and navigation of the Indian Ocean at that period. The author gives a very characteristic description of the phenomena produced at the embouchures of rivers on the coasts of India, now known under the name of "bores."⁷

During the reign of Hadrian, Flavius Arrianus wrote the Periplus of the Pontus SECOND CENTURY
A.D.
Euxinus; this work, which is simply an official report, adds little information of a PERIPLUS OF THE
PONTUS EUXINUS.
general kind to what was already known of the Black Sea, but gives copious and accurate details regarding its coasts useful to navigators.

Before considering the work of Ptolemy, a return to the ideas of Hipparchus

¹ The ideas of Seneca upon the geological action of marine and fresh water, summarised above, are found in the first two chapters of the third book of *Questiones Naturales*. Dr. Nehring, *op. cit.*, whom we have followed, has arranged these ideas methodically, in accordance with the rules followed in modern geological text-books.

² "Venient annis sæcula seris,
Quibus Oceanus vincula rerum
Laxet, et ingens pateat tellus,
Tethysque novos detegat orbes,
Nec sit terris ultima Thule."—Seneca, *Medea*, 376.

³ 23 to 79 A.D.

⁴ Pliny, *Hist. Nat.*, ii. 66:—"Nec argumentis hoc investigandum, sed jam experimentis cognitum."

⁵ Some MSS. have 144 and some 164 species. ⁶ Pliny, *Hist. Nat.*, xxxii. 53. ⁷ *Periplus Maris Erythræi*, sec. 45, 46.