

men concerning the origin of its saline impregnation." It was not until the time of Boyle that the theory at present held regarding the origin of salt in the sea was propounded.

The rage for geographical exploration which set in after the discovery of America naturally brought the phenomena of the sea into greater prominence. Sir John Hawkins' story, as told by Boyle, while almost poetical enough to suggest Coleridge's well-known lines,<sup>1</sup> has yet a flavour of scientific observation about it:—

“Were it not for the Moving of the Sea, by the Force of Winds, Tides and Currents, it would corrupt all the World. The Experience of which I saw *Anno* 1590, lying with a Fleet about the Islands of *Azores*, almost Six Months, the greatest Part of the time we were becalmed, with which all the Sea became so replenished with several sorts of Gellies and Forms of Serpents, Adders and Snakes, as seem'd Wonderful; some green, some black, some yellow, some white, some of divers Colours, and many of them had Life, and some there were a Yard and a half, and some two Yards long; which had I not seen, I could hardly have believed; and hereof are Witnesses all the Company of the Ships, which were then present, so that hardly a Man could draw a Bucket of Water clear of some Corruption.”<sup>2</sup>

The Science of the Sea may be said to date from the seventeenth century. The methods used were crude, but they sometimes contained the germs of great ideas; the results arrived at were often erroneous, but they were steps in the right direction; and the researches were animated by the true scientific spirit, the spirit of observation and experiment.

In his paper, *Of the Saltness of the Sea*,<sup>3</sup> Boyle detailed a great number of experiments. He personally made a series of observations on the water of the English Channel, collecting it from various depths, and observing its specific gravity. The samples from beneath the surface were probably procured by means of Hooke's water-bottle, an extremely ingenious valved box, which is fully described and figured in one of the early numbers of the *Philosophical Transactions*.<sup>4</sup> Boyle investigated the saltness of the water by a number of processes: he tried the estimation of total solids by direct evaporation and ignition, but not being satisfied with the result he ultimately took the density as an index of the saltness, and determined this either by means of a glass hydrometer, by weighing in a phial which was afterwards weighed when full of distilled water, or by weighing a piece of sulphur in distilled water and sea water consecutively.

“As for the different degrees of the saltness of the sea,” says Boyle, “I shall deliver what I have been informed of as briefly as I can. And first, it hath been observed, by one

<sup>1</sup> “The very deep did rot: O Christ!  
That ever this should be!  
Yea, slimy things did crawl with legs  
Upon the slimy sea.”

<sup>2</sup> Boyle's Works, epitomized by Boulton, vol. i. p. 281, London, 1699.

<sup>3</sup> *Ibid.*, p. 274.

<sup>4</sup> *Phil. Trans.*, vol. ii. p. 442, 1667. (The figure is reproduced in the tailpiece to this Introduction.)