be separated from the water, and thus these analyses gave long and very conflicting lists, all claiming to present the precise quantity of sulphate and muriate of soda, of sulphate and muriate of magnesia, and of sulphate and muriate of lime, in the water. It was not until 1818 that the different proportions in which these salts were procured were conclusively shown to be due, not, necessarily, to any difference in the sea water, but to differences in the methods of analysing it. In that year Dr. John Murray of Edinburgh published an extremely valuable research on the water of the Firth of Forth;[1] he showed that by treating portions of the same sample of water in different ways, widely different quantities of the various salts might be obtained, and that the only satisfactory method of proceeding was to determine each base and each acid separately. The attempt to discover whether the composition of sea water differed at different places was frequently made, but the conditions of observation were unsatisfactory. The samples could not be relied upon as properly collected or preserved, and much uncertainty remained on the subject.

Péron, a French naturalist who went round the world in the year XII. of the Republic (1805), made a number of observations on the temperature of the ocean at different depths. He was strongly impressed by the importance of oceanic research, and wrote :—"Of all the experiments in Natural Philosophy there are few the results of which are more interesting or more curious than those which form the subject of this memoir. The meteorologist must derive from them valuable data in regard to atmospheric observations in the middle of the ocean ; they may furnish to the naturalist knowledge indispensably necessary in regard to the habitation of the different tribes of marine animals ; and the geologue and philosopher will find in them the most certain facts in regard to the propagation of heat in the middle of the seas, and of the physical state of the interior parts of the globe, the deepest excavations of which can scarcely go beyond the surface. In a word, there is no science which may not derive benefit from the results of experiments of this kind. How much then ought we to be surprised that they have hitherto excited so little attention!"[2]

Péron's results were very erroneous ; he imagined that the bed of the ocean was covered with eternal ice, and that, as a consequence, life was impossible there. From the state of deep-sea research at the time this theory was quite plausible and required to be refuted before it was rejected. Sir John Ross's great Arctic voyage in 1818 furnished complete and most satisfactory evidence that Péron's deductions were wrong. Apart from the exploring work and the very valuable magnetic observations of Ross's expedition, it stands out in history as the first in which satisfactory soundings were made and samples of the bottom obtained. Ross had invented an arrangement, which he called the "Deep-sea Clamm," for gripping a portion of the bottom and

[1] *Trans. Roy. Soc. Edin.*, vol. xiii. p. 205, 1818.

[2] *Journal de Physique*, t. lix. p. 361, an. xiii. ; *Phil. Mag.*, ser. 1, vol. xxi. p. 129, 1805.