

upon the salts which it contains in solution. At an early period in the earth's history, the water now forming the ocean, together with the rivers, lakes and snowfields of the land, existed as vapor, in which were mingled many other gases and vapors, the whole forming a vast atmosphere surrounding the still intensely hot globe. Under the enormous pressure of the primeval atmosphere, the first condensed water might have had a temperature little below the critical one.¹¹ In condensing, it would carry down with it many substances in solution. The salts now present in sea-water are to be regarded as principally derived from the primeval constitution of the sea, and thus we may infer that the sea has always been salt. It is probable, however, that, as in the case of the atmosphere, the composition of the ocean-water has acquired its present character only after many ages of slow change, and the abstraction of much mineral matter originally contained in it. There is evidence, indeed, among the geological formations that large quantities of lime, silica, chlorides and sulphates have in the course of time been removed from the sea.¹²

But it is manifest also that, whatever may have been the original composition of the oceans, they have for a vast section of geological time been constantly receiving mineral matter in solution from the land. Every spring, brook and river removes various salts from the rocks over which it moves, and these substances, thus dissolved, eventually find their way into the sea. Consequently sea-water ought to contain more or less traceable proportions of every

¹¹ Q. J. Geol. Soc. xxxvi. (1880), pp. 112, 117. Fisher, "Physics of Earth's Crust," 2d edit. p. 148.

¹² Sterry Hunt supposed that the saline waters of North America derive their mineral ingredients from the sediments and precipitates of the sea in which the Palæozoic rocks were deposited. "Geological and Chemical Essays," p. 104.