

substance which the terrestrial waters can remove from the land—in short, of probably every element present in the outer shell of the globe, for there seems to be no constituent of the earth which may not, under certain circumstances, be held in solution in water. Moreover, unless there be some counteracting process to remove these mineral ingredients, the ocean-water ought to be growing, insensibly perhaps, salter, for the supply of saline matter from the land is incessant. It has been ascertained indeed, with some approach to certainty, that the salinity of the Baltic and Mediterranean is gradually increasing.¹³

The average proportion of saline constituents in the water of the great oceans far from land is about three and a half parts in every hundred of water.¹⁴ But in inclosed seas, receiving much fresh water, it is greatly reduced, while in those where evaporation predominates it is correspondingly augmented. Thus the Baltic water contains from one-seventh to nearly a half of the ordinary proportion in ocean-water, while the Mediterranean contains sometimes one-sixth more than that proportion. Forchhammer has shown the presence of the following twenty-seven elements in sea-water: oxygen, hydrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, nitrogen, carbon,

¹³ Paul, in Watts's "Dictionary of Chemistry," v. p. 1020. For a detailed study of the Eastern Mediterranean, see the Reports of a Commission, Denksch. Akad. Wiss. Vienna, 1892 *et seq.*

¹⁴ Dittmar's elaborate researches on the samples of ocean water collected by the "Challenger" expedition show that the lowest percentage of salts obtained was 3.301, from the southern part of the Indian Ocean, south of lat. 66°, while the highest was 3.737, from the middle of the North Atlantic, at about lat. 23°. Some valuable results from observations on the waters of the North Atlantic are given by H. Tornøe and L. Schmelck in the Report of the Norwegian North-Atlantic Expedition, 1876-78. The average proportion of salts was found to be from 3.47 to 3.51 per cent, the mean quantities of each constituent as estimated being as follows: CaCO_3 , 0.002; CaSO_4 , 0.1395; MgSO_4 , 0.2071; MgCl_2 , 0.3561; KCl , 0.0747; NaHCO_3 , 0.0166; NaCl , 2.682.