

herring in their migrations keep to a water whose concentration ranges from 3.2 per cent to 3.3 per cent.

From the constancy of the relative proportion of the salts in sea water it follows that every such constituent is subject to no greater variations than the sum of all. Interesting recent experiments have shown this fact to be of vital consequence to living organisms. Thus a host of experiments of Loeb and his pupils, and of others, have demonstrated remarkable toxicity in the action of pure salts, physiologically antagonistic actions of various pairs of salts, and peculiar advantages of media containing a variety of salts in definite relative amounts.<sup>1</sup> Of all such balanced solutions sea water is by far the best, a condition which is almost certainly due to the processes of organic evolution. Herbst<sup>2</sup> has shown that the development of the fertilized eggs of sea urchins can only take place in the presence of the chlorides, sulphates, and carbonates of sodium, potassium, calcium, and magnesium, and in a faintly alkaline reaction. Every one of these substances is essential,

<sup>1</sup> See the article by Loeb in Oppenheimer's "Handbuch der Biochemie."

<sup>2</sup> Herbst, *Archiv. für Entwicklungsmechanik*, 5, 650, 1897; 7, 486, 1898; 11, 617, 1901; 17, 306, 1904.