

*Chemical Geology*, and the later work of J. Roth (1879) contains an even fuller account of this subject. The deposits formed in a purely chemical way, without any assistance from organisms, have been so systematically and ably elucidated by Bischof and Roth, that there is now scarcely any difference of opinion among geologists regarding the origin of calcareous tufa, travertine, ochre, hydrous ferric oxide or "moorband pan," siliceous sinter, fresh-water limestone and dolomite, and other kinds of spring and fresh-water deposit. Mellard Reade has more recently calculated the amount of material held in chemical solution in rivers and transported by them to the sea. If his figures are confirmed by further analyses, they will form the basis of far-reaching conclusions.

The earliest analyses of sea-water made in the nineteenth century were those of Vogel, Marcet, Wollaston, and Bibra. In the year 1845, the famous Copenhagen chemist, Forchhammer, began a series of researches on the composition of sea-water, and twenty years later his admirable treatise on the subject was published. Bischof and Roth also investigated the composition of sea-water.

It may be said in general that no chemical deposits form on the floor of the open sea, as the immense volume of sea-water holds the substances in solution. Only very small quantities of lime carbonate and magnesium carbonate or dolomite seem to be deposited under certain conditions.

In inland salt seas, gypsum and rock-salt separate out in large quantities and form thick floor deposits—for example, in the Great Salt Lake of Utah, the salt seas of Central Asia and Southern Russia, in the Shotts of the Sahara, and in many bitter lakes. The process of the spontaneous evaporation of sea-water was studied by Usiglio (1849) on Mediterranean water, and by his laboratory experiments he determined the order in which the various salts are deposited during progressive concentration of the brine liquor. Usiglio's results were then applied in the production of salt from sea-water for commercial purposes.

An attractive account of the saline basins in the North Caspian Steppes was contributed to Erman's Journal by Baer in 1854. The salt deposits were carefully described, and the author concluded from the distribution of the basins that the Caspian Sea was formerly of far wider extent. Baer demonstrated that the waters of the Caspian Sea are still diminishing