

the soundings, and a general map is drawn representing their geographical distribution.

The deposits due to the mechanical action of water are almost entirely of terrigenous origin. River detritus and the sand and mud produced by wave action are floated seaward and spread on the floor by the action of marine currents. The blue colouring matter in terrigenous deposits is sometimes an organic substance, sometimes iron sulphide; the green colour is due to glauconite, the red colour to yellow iron ore. On the coasts where volcanic rocks predominate, marine mud consists of finely triturated volcanic material. The pelagic "Red Clay" so widely distributed in the Pacific and Indian Oceans as a rule occupies the deeper stretches of the ocean-floor. According to the investigations of Murray and Renard, deep-sea "Red Clay" is essentially composed of strongly decomposed volcanic material, originating partly from subaerial, partly from submarine eruptions, and also contains "numerous remains of whales, sharks, and other fishes, together with zeolitic crystals, manganese nodules, and minute magnetic spherules, which are believed to have a cosmic origin" (see Murray, "Oceanography," *Geographical Journal*, 1899). The Red Clay deposits pass, in most places, quite gradually into the calcareous oozes.

A special interest attaches to the chemical changes that take place in the waters of the ocean or the ocean-floor by the action of the sea-water upon the various kinds of sediment. The zeolitic, manganitic, and phosphatic contents of the Red Clay betray what an important part has been played by chemical interchange in determining the actual constitution of this extensive deposit. The more accurate knowledge of the ocean-floor has thrown a flood of new light upon all researches regarding the deposits of past geological epochs, their correlations, their origin, their constitution, their subsequent transformations, chemical and dynamical. It is not too much to say that the *Challenger* Expedition marks the grandest scientific event of the nineteenth century.

*Chemical Deposits in Water.*—Chemical, technical, medical, and geological works have published innumerable analyses of the chemical deposits separated in springs, underground water, rivers, and lakes. Gustav Bischof summarised the most important results of this extensive literature in his