

temperature, and dredging operations in deep water. During the last twenty years the British Telegraph ships have furnished a large amount of information regarding the depth and nature of the deposits on the floor of the ocean, especially the ships belonging to the Telegraph Construction and Maintenance Company, and those of the India-Rubber, Gutta-Percha, and Telegraph Works Company.¹ The specimens of deposits procured by these ships, as well as those of the British Navy, have enabled Murray and Renard to give a much more complete idea of the distribution of the various kinds of deposits in the different regions and depths throughout nearly all oceans than was possible from the study of the Challenger collections alone.

From 1886 to 1892 a detailed physical and biological exploration of the conditions of the lochs and fjords of the coast of Scotland has been conducted by Murray, assisted by Mill, Irvine, Anderson, and others, interesting results as to the distribution of temperature, salinity, and the effect of winds on the circulation of the water having been obtained. The chemical composition of the water associated with the deposits has been systematically investigated and compared with that of the superincumbent layers, and much light has been thrown on the formation of manganese nodules, as well as on the changes taking place in deep-sea deposits. The distribution of organisms in the deeper lochs has also been carefully studied.² Some excellent work has been carried out by Mill, Gibson, and Dickson, on board the ship "Jackal," with reference to the specific gravity and temperature of the sea-water off the northern coasts of Scotland in recent years,³ these observations during the summer of 1893, under the charge of Mr. Dickson, being simultaneous with like observations by Swedish investigators at the entrance to the Baltic.

No better instance of a detailed piece of oceanographical work can be cited than that now being carried on by the Swedish authorities in the Baltic and north-eastern portions of the North Sea at all seasons of the year. Professor Otto Pettersson has given a most excellent account of these detailed investigations, which have thrown much light on the movements of large bodies of water from different sources, and on the influence of these movements on the distribution of marine organisms at different seasons of the year.⁴

¹ See J. Y. Buchanan, On oceanic shoals discovered in the s.s. "Dacia" in October 1883, *Proc. Roy. Soc. Edin.*, vol. xiii. p. 428, 1886; On the land slopes separating continents and ocean basins, especially those on the West Coast of Africa, *Scot. Geogr. Mag.*, vol. iii. p. 217, 1887; The exploration of the Gulf of Guinea, *Scot. Geogr. Mag.*, vol. iv. pp. 177 and 233, 1888.

² See Murray, On the effects of winds on the distribution of temperature in the sea and fresh water lochs of the West of Scotland, *Scot. Geogr. Mag.*, vol. iv. p. 345, 1888; H. R. Mill, The Clyde Sea-Area, *Trans. Roy. Soc. Edin.*, vol. xxxvi. p. 641, 1891, and vol. xxxviii. p. 1, 1894; Murray and Irvine, On the chemical changes which take place in the composition of the Sea-Water associated with Blue Muds on the floor of the ocean, *Trans. Roy. Soc. Edin.*, vol. xxxvii. p. 481, 1893; Murray and Irvine, On the Manganese Oxides and Manganese Nodules in Marine Deposits, *Trans. Roy. Soc. Edin.*, vol. xxxvii. pp. 721-742, 1894; W. S. Anderson, On the determination of sea-water densities by hydrometers and Sprengel tubes, *Scot. Geogr. Mag.*, vol. x. pp. 574-590, 1894.

³ See H. N. Dickson, Report on Physical Investigations carried out on board H.M.S. "Jackal," 1893-94, 12th Annual Report of the Fishery Board for Scotland, p. 336, 1894.

⁴ Otto Pettersson, A Review of Swedish Hydrographic Research in the Baltic and North Seas, *Scot. Geogr. Mag.*, vol. x. pp. 281, 352, 413, 449, 525, 1894.