

reference to Sir J. C. Ross's Antarctic Expedition, calling attention to the importance of observing the microscopic organisms, which Ehrenberg had shown played so important a rôle in the constitution of terrestrial strata. Hooker first made known some of the results of Ross's deep-sea dredgings and investigations in 1845,¹ and fuller details were given by Ross himself in the account of the voyage published in 1847. Hooker observed² that the water and ice of the Antarctic regions swarmed with Diatoms to such an extent that they gave the water a brown tint. Between lat. 50° and 70° S. prodigious quantities of them were found, and in lat. 80° S. all the surface ice, the sides of the icebergs, and the base of the great Victoria Barrier within the reach of the waves, were coloured brown by these organisms. He observes that the siliceous skeletons must, after the death of the organisms, form siliceous deposits of considerable extent around all coasts bordered with ice, at depths between 80 and 400 fathoms. Opposite Victoria Barrier the bottom was covered with a white or greenish mud, consisting principally of Diatom frustules. In very deep water, opposite Victoria and Graham's Land, the mud was very pure and fine grained, but in shallow water, near the coast, it was mixed with sandy and gravelly particles. Hooker considered that these microscopic plants were intended to maintain in the south Polar regions the balance between the animal and vegetable kingdoms, and also to purify the vitiated atmosphere, performing in Antarctic latitudes the part of plants in other regions. He states that Diatoms exist in every latitude from Spitzbergen to Victoria Land, Iceland, Great Britain, the Mediterranean, North and South America, and the islands of the South Sea, and that the frustules of species living in the Antarctic have contributed to the formation of various strata during geological periods. He estimates that the deposit formed principally of Diatom frustules extends continuously for more than 400 miles off Victoria Land, at depths of about 300 fathoms. The existence of remains of Diatoms, including a few Antarctic species, in volcanic ashes, pumice, and scorïæ, led him to suppose that organic substances covering the bases of active volcanoes, like Mount Erebus and Vesuvius, might be ejected from the craters along with volcanic products.

The researches of Ross and even those of Ehrenberg cannot be said to have established any important generalisation. The advantages to be derived from a knowledge of the horizontal and vertical distribution of the organisms living under the waters of the sea at greater or less distances from the shore do not appear to have been at first understood. However, as far back as 1838, H. T. de la Bèche inserted, in his *Recherches sur le partie théorique de la géologie*, a map by Brodrip indicating the localities and the depths at which living specimens of shellfish had been found in the sea and at the mouths of rivers.

Risso, whose observations were made in the Gulf of Genoa, was the first to distinguish

¹ *Ann. and Mag. Nat. Hist.*, ser. i., vol. xvi. p. 238, 1845.

² *Brit. Ass. Report for 1847*, Trans. of Sections, p. 83; see also *Flora Antarctica*, London, 1847.