CHAPTER II.

Departure from Portsmouth—Sounding and Dredging—Arrival at Lisbon—Soundings and Dredgings off the Tagus—Gibraltar—Soundings and Dredgings between Gibraltar and Madeira—The Pennatulida—Tenerife—Soundings and Dredgings in the vicinity of the Canary Islands—Departure from Tenerife for the West Indies—Description of Method of Sounding, Dredging, and of making other Observations at Sea.

Portsmouth to Gibraltar.

The Challenger left England on the 21st December 1872, and experienced heavy southwesterly gales until the 30th, when the parallel of Cape Finisterre was reached. From this position to Lisbon, which port was reached on the 3rd January 1873, the weather was variable, but on the whole fine, so that it was possible to test the sounding and dredging gear, and instruct the ship's company in duties new to nearly all of them. Five soundings and three hauls of the dredge were obtained in depths varying from 325 to 1975 fathoms (see Sheets 2 and 3). These first operations were not very successful, as the sounding line parted on three occasions, the dredge rope once, and the dredge on one occasion came up foul. These accidents were due partly to inexperience, and partly—as was found out afterwards—to the defective condition of the medium-sized sounding line which was at first used instead of the No. 1 line, its breaking strain being 7 cwt. instead of 10 cwt. The dredge rope was lost owing to the dredge fouling something at the bottom, from which it could not be cleared, and at the time it parted the tension was certainly equal to, if not greater than, the warranted breaking strain, viz., $2\frac{1}{2}$ tons. It has been suggested that the dredge may have fouled the telegraph cable which passes along this coast.

The ship was detained at Lisbon till the afternoon of the 12th January by a heavy gale from the southwest and by cloudy weather, which prevented the observations necessary for rating the chronometers being obtained.

On leaving Lisbon light easterly and northerly winds were experienced, and several soundings and some successful hauls with both the dredge and trawl were taken, in depths varying from 84 to 1800 fathoms (see Sheet 3). The incline off the river Tagus was found to slope gently down to 1475 fathoms, 31 miles from the shore.

The deposit at 560 fathoms, off the mouth of the Tagus, was a green mud, consisting of Foraminifera, Coccoliths, fragments of Echinoderms, Molluscs, and Polyzoa; angular fragments of quartz, felspar, mica, magnetite, and many glauconitic particles. The calcareous organisms made up 32 per cent. of the deposit, and, after treatment with weak hydrochloric acid, many dark and pale green, perfectly formed, glauconitic casts were observed. The percentage of carbonate of lime in the deeper deposits remained about the same, but the glauconitic particles were not nearly so abundant. The mineral constituents of this