

b. REMARKS ON THE VARIATION OF THE DEPOSITS WITH CHANGE OF CONDITIONS ALONG THE DIFFERENT LINES OF SOUNDINGS AND DREDGINGS.

With the view of enabling the reader to obtain a general idea of the more important variations which take place in the nature and composition of marine deposits with a change in the conditions, special reference will now be made to the different lines of soundings and dredgings of the Challenger Expedition across the various oceanic basins, and along the coasts of continents and oceanic islands. In doing this we shall in a special manner point out the variations which appear to be due directly to differences in depth and of distance from coast influences. A somewhat graphic representation of these lines of soundings is presented in the Diagrams at the end of the Volume, where the percentage of carbonate of lime in the deposits is placed beneath the name at each station, and where the temperature conditions and submarine reliefs are also shown.

1. *Atlantic Ocean.*

*England to Gibraltar.*—A number of preliminary soundings and dredgings were made along the coasts of Spain and Portugal, at the outset of the Expedition, with the view of testing the various kinds of apparatus. (See Charts 2 and 3).

The deposit at 560 fathoms, off the mouth of the Tagus, was a Green Mud or Sand, 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 about 32 per cent. of the deposit, and, after treatment with dilute 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 deposit are chiefly derived from the disintegration of continental land, and are similar in all respects to those found later on to prevail along the borders of the great continents. Passing outwards from the shore, the deposit altered to a Blue Mud, which, as the shore was again approached, became a Green Mud in about 1000 fathoms, and Green Sands in lesser depths. In the Green Muds the glauconitic casts were found to be abundant, while they were almost if not entirely absent in the Blue Muds.

*Gibraltar to Madeira.*—Between Gibraltar and Madeira six soundings and three hauls of the trawl were obtained, in depths varying from 1090 to 2000 fathoms (see Charts 2 and 3). The deposit at each of the stations at which a sample was obtained was a Globigerina Ooze. The percentage of carbonate of lime ranged from 53 to 75, and consisted almost entirely of pelagic Foraminifera, Coccoliths, and Rhabdoliths. The residue, insoluble in dilute acid, consisted of a few Radiolaria, minute particles of quartz, felspar, augite, glassy volcanic fragments, and clayey matter.