

inspected in the wet and dried condition, and its general aspect, colour, grain, and greater or less plasticity in the former state, and its brittleness, cohesion, colour, grain, and the streak of the clayey matter in the latter state, were noted. It seemed necessary to distinguish the differences in the characters of the substance in the wet and dry condition, as these are often considerable, the colour being often deeper in the wet material, the condition in which it is usually seen by seamen when brought on board ship. Macroscopic examination itself permits a classification of deposits into certain well-defined categories, in accordance with their mode of formation and composition. It shows in a general way the composition of the deposit, and especially the part taken in its composition by organic and inorganic elements. Colour in this relation is important, as it frequently enables us to distinguish at once an organic ooze from a mud or clay made up chiefly of inorganic materials, especially when taken in combination with the grain and other physical peculiarities.

The colour and other physical characters of the RESIDUE left after the removal of the carbonate of lime are likewise important, for they frequently enable us to trace the connection between a typical Red Clay and the residue present in a Globigerina Ooze, the colour of the residue in such an ooze being often entirely masked by the abundance of the calcareous shells; the colour of this residue is noted, in the tables, in the same column as the name and physical characters. *Plasticity* points out the greater or less abundance of clayey matter; the *farinaceous aspect* indicates abundance of Diatom frustules; the *grain* tells as a rule whether the deposit comes from near a coast, from the open sea, or from a region affected by floating ice.

The fundamental characters of a deposit revealed by a macroscopic examination become much more definite and precise when followed by a detailed examination of its component particles, commencing with a microscopic examination of the calcareous organisms, which were separated by decantations into finer and coarser portions, and examined in the wet and dried conditions. This was accomplished by placing the wet substance in long clear glass wash bottles, and shaking up with abundance of clean water, so as to separate the particles one from another and free them of amorphous matter. Subsequently the various products of decantation, when dry, were passed through sieves with very fine meshes. The genera and species of the organisms could in this way be determined with great accuracy, and their relative abundance could be estimated. In over a hundred of the deposits all the calcareous organisms were carefully picked out by means of a moistened camel-hair pencil from under the microscope, and then mounted on separate slides when the species were determined; this was a work requiring great care and patience, and was latterly most successfully and expeditiously performed by Mr. Frederick Pearcey, who accompanied the Expedition, and was subsequently assistant in the Challenger Office. In this way the Molluscs, Foraminifera, fragments of Polyzoa, Annelid tubes, Corals, otoliths of fish, and other calcareous fragments underwent careful