

operating upon very large samples of sea-water carefully collected from the central regions of the Atlantic, Mediterranean, and Indian Ocean, they have shown that a small quantity of mechanically-suspended hydrated silicate of alumina is always present in the water of these regions.¹

If these observations be confirmed by further investigations, it must be admitted that a small quantity of clay can be transported to the central regions of the great ocean basins, and, falling to the bottom, may there make up a part of Red Clays and of the clayey matter in pelagic deposits. The amount of clay thus transported must, however, be very small, for otherwise it would mask the minute fragments of pumice, or the organic remains, which there make up so large a part of the deposits.

In the deep-sea regions far from land the clay on the floor of the ocean appears, for the most part, to arise from the decomposition *in situ* of water-borne pumice and other volcanic rocks and minerals, which make up the principal inorganic constituents of the deposits of these regions. The vitreous and vesicular nature, as well as the small dimensions, of these volcanic fragments render them in a special manner liable to disintegration and decomposition, with the production of clay; especially is this the case with the basic volcanic glasses. All the deep-sea clays contain a large number of minute glassy and other mineral particles, and hence they fuse readily before the blowpipe into a black magnetic bead. The amorphous material observed in these deposits is regarded as the argillaceous matter; it presents essentially vague characters, resembles a colloid substance, has no definite contours, is perfectly isotropic, is generally colourless, and forms a gelatinous-like mass that connects and agglutinates the other materials in the clay or mud. With these indefinite physical characters it becomes very difficult to estimate even approximately the amount of pure amorphous argillaceous matter in the samples of a marine deposit. A very small quantity of this slimy-like matter, however, may give a distinctly clayey character to a calcareous or siliceous mud or ooze, especially when the mineral particles in the deposit are of small dimensions.

The clayey matter of marine deposits must then be regarded as a chemical product arising from the decomposition of the aluminous silicates composing the crust of the earth, exposed to the action of water, either on the dry land or at the bottom of the sea. It may be formed *in situ* on the sea-bottom, and this is especially the case in pelagic deposits, or the clayey matter may be transported from the land surfaces and coasts to the ocean basins, and this is what especially takes place in terrigenous deposits. The amount of clay varies according to the abundance of other substances in deposits, being least in calcareous deposits like Coral Muds and Pteropod and Globigerina Oozes, where it becomes masked by the accumulation of carbonate of lime, and greatest in Red Clays

¹ Murray and Irvine "On Silica and the Siliceous Remains of Organisms in Modern Seas," *Proc. Roy. Soc. Edin.*, vol. xviii. pp. 229-250, 1891. Further experiments have shown that sea-water with a salinity of 1.025, after remaining for over thirty days absolutely at rest, holds up in suspension finely-divided clay in amount equal to 625 tons in one cubic mile of the water (J. M.).