the terrigenous deposits, in which the materials washed down from the land play so large a part. The Pteropod and Globigerina Oozes of the tropical regions, being chiefly made up of the calcareous shells of a much larger number of tropical species, must necessarily accumulate at a greater rate than the Globigerina Oozes in extra-tropical areas or other organic oozes. Diatom Ooze, being composed of both calcareous and siliceous organisms, has, again, a more rapid rate of deposition than the Radiolarian Ooze, while in a Red Clay there is a minimum rate of growth.

It has already been stated that cosmic spherules, sharks' teeth, the earbones and other bones of Cetaceans, are much more numerous in a Red Clay than in any other deposit, and it has been urged that the greater or less abundance of these might be taken as a measure of the rate of deposition. These spherules, teeth, and bones are abundant in the Red Clays, because few other substances there fall to the bottom to cover them up, and they thus form an appreciable part of the whole deposit. In the organic oozes and terrigenous deposits, however, a large number of additional substances contribute to form the bulk of the mud or ooze, and the chance of cosmic spherules, sharks' teeth, or earbones being dredged from these deposits is proportionally small, and as a matter of fact only a few have been obtained in these deposits.

The volcanic materials in a Red Clay having, because of the slow accumulation, been for a long time exposed to the action of sea-water, are profoundly altered, the decomposition being accompanied by the formation of clay, massive manganese-iron nodules, and zeolitic crystals, just as the formation of glauconite, phosphatic, calcareous, and barium nodules accompany the decomposition of terrigenous rocks and minerals in deposits nearer continental shores.

It has been argued by Dieulafait and others that the manganese of the manganese nodules has fallen from the surface and has accumulated in the red clay areas owing to the non-deposition of other substances. In opposition to this view it must be pointed out that some of the Challenger's largest hauls of manganese nodules were not in the red clay areas, but in Pteropod and Globigerina Oozes, or near volcanic cones. These Pteropod and Globigerina Oozes always contained a large quantity of volcanic glass, in a fine state of sub-division, and many minute particles of palagonite. In other Globigerina Oozes, where the rate of deposition must have been about the same or less, and where the volcanic particles were absent or relatively rare, only traces of manganese peroxide could be detected. For these reasons the abundance of manganese in a deposit cannot be looked upon as an index of the rate of deposition. The conditions in which manganese nodules and zeolitic crystals occur, frequently suggest the proximity of volcanic phenomena at the bottom of the sea, and no more instructive work could be undertaken than the exhaustive examination of one of these areas, that in the South Indian Ocean for example, where the surroundings suggest that the carbonate of lime shells have been removed from the deposit some time after deposition as a result of submarine volcanic action.