The origin of the clayey materials, and the products of the decomposition of the rocks and minerals spread over the floor of the ocean, will be discussed in detail later on, but from what has been stated above it will be evident that the Red Clay must be regarded as essentially a chemical deposit universally distributed in the ocean basins, but only appearing with its typical characters in the greatest depths far from continental land. Microscopic examination and chemical analysis have shown that volcanic rocks and minerals are to be found everywhere distributed in oceanic formations, and that in many regions the most frequent among these belong to the basic series all containing alumina. It is known that these very rocks—basalts, andesites, &c.—give by their decomposition argillaceous matters, so that we are led to conclude that this clayey deposit is chiefly the result of the decomposition *in situ* of these substances, as will be shown at greater length in Chapters V. and VI.

Even admitting that chemical decomposition at the bottom of the sea is not more active than at the surface of the continents, the rocks and mineral fragments would undergo much the same alterations at the bottom of the sea as on the surface of the terrestrial masses, where silicates and aluminous rocks are observed to be decomposed under the influence of water, and transformed into clayey materials, almost always mixed with the other products of decomposition of the rocks and silicates, giving origin to clay. These reactions taking place in the greater depths at the bottom of the sea, where the waters are not subject to any rapid movements, the products of decomposition are not transported to great distances, as is the case on the continents, and therefore, as has been already stated, these clays must be impure. The diffusion can not, moreover, be very rapid, and the chemical bath can act in a slow and constant manner on the solid materials with which it is in contact. Without entering here into the discussion of the question, we seem justified in regarding the greater part of the fine material, as well as the zeolites and nodular masses, of the red clay deposits as having been formed *in situ* through chemical action. This result, as will be shown, is not out of harmony with what we know of the distribution of the material borne down to the ocean from the land.

As far as our knowledge at the present time extends, Red Clay would appear to be the most extensive of all Marine Deposits, being estimated to cover about 51,500,000 square miles, or more than one-fourth of the total area of the globe, as will be seen by an inspection of the accompanying map (Chart 1) showing the distribution of Marine Deposits.

In the Atlantic the area occupied by Red Clay is much less than that occupied by Globigerina Ooze, being estimated at about 5,800,000 square miles. It is found in five detached areas—two in the North Atlantic, one in the eastern, the other in the western portion of the basin, separated by the Dolphin Ridge; three in the South Atlantic, two some distance off the South American coast, the other off the African coast, separated by the Challenger Ridge running north and south towards the centre of the South Atlantic