

longing to certain well-defined families, complete the fauna of the region. Next we have a layer an inch or two in thickness, somewhat more firm in consistence, in which most of the shells of all kinds are more or less broken up, and their fragments cemented together by a calcareous paste, the result of the complete disintegration of many of them; and beneath this a nearly uniform calcareous paste, colored gray by decomposed organic matter, and containing whole and fragmentary shells only sparsely scattered through it. Excellent samples, showing the gradual passage from one condition into the other, are often brought up in the tube of the sounding-machine.

Since the time of our departure, Mr. Murray has been paying the closest attention to the question of the origin of this calcareous formation, which is of so great interest and importance on account of its anomalous character and its enormous extension. Very early in the voyage, he formed the opinion that all the organisms entering into its composition at the bottom are dead, and that all of them live abundantly at the surface and at intermediate depths, over the globigerina-ooze area, the ooze being formed by the subsiding of these shells to the bottom after death.

This is by no means a new view. It was advocated by the late Professor Bailey, of West Point, shortly after the discovery, by means of Lieutenant Brooke's ingenious sounding-instrument, that such a formation had a wide extension in the Atlantic. Johannes Müller, Count Pourtales, Krohn, and Max Schultze observed *Globigerina* and *Orbulina* living on the surface; and Ernst Haeckel, in his important work upon the Radiolaria, remarks "that we often find upon, and carried along by, the floating pieces of sea-weed which are so frequently met with in all seas, foraminifera as well as other animal forms which habitually live at the bottom. However, setting aside these accidental instances, certain foraminifera, particularly in their younger stages, occur in some localities so constantly, and